

**The Perceived Effectiveness of Anti-Smoking Policies of College Students in the
Mendiola Consortium**

In Partial Fulfillment of the Requirements for the Course
Economic Research II

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Chapter I

Background of the Study

This chapter presents the Introduction, Statement of the Problem, Objectives of the Study, Significance of the Study, and Scope and Delimitations. It provides an overview of the study's context and establishes the rationale for examining the influence of monthly allowance and university anti-smoking policies on the nicotine consumption behavior of students within the Mendiola Consortium.

Introduction

Youth nicotine consumption in the Philippines continues to be a pressing public health concern, particularly among young adults aged 18 to 24 who are in a critical developmental stage where autonomy, peer influence, and financial independence expand rapidly. Despite national-level interventions such as the Expanded Graphic Health Warning Law and higher excise taxes under Republic Act No. 11346, nicotine use among young adults persists in more adaptive forms. The 2021 Global Adult Tobacco Survey (GATS) reports that the average age of smoking initiation in the Philippines is 20.9 years, indicating that many individuals begin or solidify nicotine use during their university years. During these years, many students deal with more stress, spend more time with friends, and encounter nicotine products more frequently, both inside and outside school.

The rise of electronic nicotine delivery systems further complicates the issue. These products are widely marketed as cleaner or less harmful alternatives, yet they often serve as entry points into long-term nicotine dependence. Their accessibility, flavored variants, and portrayal as lifestyle devices make them particularly appealing to young adults navigating academic and

social pressures. Because these habits change depending on the environment, it makes sense to look more closely at what is happening in specific areas like Mendiola.

Manila provides a unique and relevant setting for such inquiry. As one of the most densely populated cities in the world with over 70,000 individuals per square kilometer, it exposes students to an environment where the availability and visibility of nicotine products are high (World Bank, 2022). The Philippine Statistics Authority (2023) reports that more than 42 percent of Manila's population is under 30, many of whom are enrolled in higher education institutions concentrated in university clusters such as the Mendiola Consortium. These urban conditions amplify exposure to tobacco retailers, convenience stores, informal vendors, and online sellers that often bypass age verification. While national and local regulations prohibit the sale of nicotine products near schools, enforcement varies significantly across different areas, contributing to persistent accessibility (SEATCA, 2019; DOH, 2020).

In many schools, anti-smoking rules help set expectations for students and become part of the campus culture, even if the level of enforcement differs from place to place. These policies typically encompass regulatory prohibitions, communication of rules, visible cues such as signage, and varying degrees of enforcement. For policies to be effective, they must be consistently implemented, clearly communicated, and supported by educational initiatives that influence student attitudes and perceived risks. However, institutional variation across campuses, including differences in monitoring, disciplinary procedures, and health promotion activities, may weaken their ability to shape behavior (Fong et al., 2006).

Equally important is the role of students' monthly allowance, which determines their purchasing power and access to nicotine products. For many college students, this allowance represents their primary source of discretionary income. With increased financial independence,

students may allocate part of their allowance to cigarettes, vapes, or related products, especially when influenced by stress, social norms, and targeted marketing (Quimbo et al., 2020; Sangalang et al., 2021). Students with lower allowances may still consume nicotine but often resort to cheaper or illicit alternatives available through informal markets (Simbulan, 2021). Thus, differences in economic capacity create differing pathways of access, frequency of use, and preferred product type.

The Mendiola Consortium, composed of San Beda University, Centro Escolar University, and La Consolacion College, offers a strategic environment for analyzing these dynamics. Situated in the heart of Manila, the consortium brings together students from diverse socio-economic backgrounds who share similar urban exposures yet experience varying institutional environments. Each member school implements its own anti-smoking measures, often with differing levels of clarity, communication, and enforcement. This institutional diversity, combined with the city's dense environment and high accessibility to nicotine products, presents an ideal setting for examining how economic and policy factors interact to influence student nicotine consumption.

Given this environment, the study seeks to investigate the extent to which students' monthly allowances and their perceptions of anti-smoking policy clarity and enforcement shape their nicotine consumption patterns. For this study, degree of consumption refers specifically to students' weekly nicotine spending, categorized into four ordered levels reflecting increasing financial commitment to nicotine products. This establishes a concrete and measurable behavioral indicator that can be compared against both economic resources and institutional policy perceptions. Understanding these relationships helps clarify how institutional and

economic contexts work together to influence youth behavior and provides evidence-based guidance for policy improvements within academic institutions.

Statement of the Problem

Nicotine consumption among college students remains influenced by a combination of financial capacity, institutional environments, and urban exposure. While national sin taxes aim to reduce affordability, students with higher monthly allowances may remain relatively unaffected by price increases. At the same time, university anti-smoking policies differ in clarity, and enforcement, which may influence how students perceive and follow these rules.

Despite existing studies, limited research directly examines how monthly allowance and institutional policies jointly shape nicotine consumption within specific academic settings such as the Mendiola Consortium. This study addresses that gap by examining the following questions:

With the foregoing situation, the study seeks to address the following questions:

1. What is the demographic profile of college students within the Mendiola Consortium in terms of age, gender, year level, monthly allowance, smoking status, and degree of consumption?
2. What are the students' perceptions of anti-smoking policies in terms of:
 - a. Policy clarity and communication
 - b. Enforcement
3. To what extent do students' perceptions of policy clarity and enforcement influence their nicotine consumption behavior?
4. How does monthly allowance affect students' nicotine consumption?

5. Based on the findings, what policy recommendations can be proposed to improve the implementation and impact of anti-smoking policies within the Mendiola Consortium?

Objectives of the Study

This study aims to examine how monthly allowance and institutional anti-smoking policies influence nicotine consumption among students in the Mendiola Consortium. Specifically, it seeks to:

1. Describe the demographic profile of students in terms of age, gender, year level, monthly allowance, nicotine use status, and degree of consumption.
2. Assess students' perceptions of anti-smoking policies in terms of:
 - a. Policy clarity and communication
 - b. Policy enforcement
3. Determine the extent to which students' perceptions of policy clarity and enforcement influence their nicotine consumption.
4. Evaluate the effect of monthly allowance on the level of nicotine consumption.
5. Formulate policy recommendations to improve the implementation and impact of anti-smoking policies within the Mendiola Consortium based on the study's findings.

Significance of the Study

The study contributes to understanding how economic capacity and institutional policies interact to shape nicotine consumption among university students. Its findings are relevant to the following stakeholders:

Educational Institutions. The study provides evidence-based insights on the effectiveness of existing anti-smoking measures, helping administrators refine rules, improve communication, and strengthen enforcement mechanisms.

Student Affairs and Health Advocacy Offices. Findings can inform the development of targeted health campaigns, cessation programs, and student engagement initiatives aimed at reducing nicotine use.

Local Government Units and Regulatory Agencies. The results may guide LGUs, the DOH, and related agencies in coordinating enforcement efforts, improving monitoring systems, and addressing access points near campuses.

Students and the Academic Community. By clarifying how institutional and economic factors influence nicotine use, the study helps students make informed health decisions and encourages their participation in campus policy discussions.

Future Researchers. The study offers empirical data and a localized analysis of nicotine consumption within an urban university setting, contributing to literature in behavioral economics and public health.

Scope and Delimitations

This study focuses on college students from San Beda University, Centro Escolar University, and La Consolacion College Manila who currently consume or previously consumed nicotine-based products such as cigarettes and vapes. It examines how monthly allowance and institutional anti-smoking policies influence their consumption patterns.

For the purpose of this study, nicotine consumption behavior refers to the students' self-reported frequency and intensity of nicotine use, measured through their preferred nicotine product, weekly spending on nicotine products, and categorized levels of use ranging from low, moderate, to high consumption. This operationalization is based on students' weekly expenditure brackets and product usage frequency, which serve as indicators of their degree of nicotine consumption.

The study does not analyze the medical or physiological health effects of nicotine use in detail. It also does not include a full administrative audit of campus policies. While factors such as family influence, stress, and peer pressure may affect smoking behavior, this research focuses exclusively on monthly allowance, policy clarity, and policy enforcement.

Chapter II

Review of Related Literature

This chapter presents a comprehensive review of existing research related to nicotine consumption, economic determinants such as monthly allowance, and institutional anti-smoking policies. The literature provides a foundation for understanding how financial capacity, regulatory environments, and campus-level enforcement influence the smoking and vaping behaviors of college students. Through an examination of empirical studies, policy analysis, and theoretical discussions, this chapter establishes the scholarly context of the study and identifies key gaps that justify the research focus on the Mendiola Consortium.

Consumption of Nicotine-Based Goods

Nicotine consumption, whether through cigarettes, heated tobacco products (HTPs), or electronic nicotine delivery systems (ENDS), is usually influenced by a mix of money-related reasons and personal habits or social influences. Classical economic theory posits that the Law of Demand influences nicotine use, where increases in price, which would be driven by excise taxes, should lead to declines in consumption (Mankiw, 2018). However, because nicotine is an addictive good, demand is often inelastic, enabling continued purchasing even in the face of rising costs (Becker & Murphy, 1988). This dynamic complicates policy interventions, as consumers may reduce quantity only marginally or shift to cheaper alternatives rather than abstaining.

The Substitution Effect explains this shift. When cigarettes become more expensive due to taxation, consumers may transition to lower-cost or less regulated alternatives like vapes or HTPs (Gallagher et al., 2020). The Income Effect further clarifies that price sensitivity varies by income level. Higher-income consumers can maintain consumption despite higher prices, while

lower-income groups are more likely to turn to untaxed or illicit products (Kotsadam et al., 2019).

Empirical studies reflect these theoretical insights. Quimbo et al. (2016) reported that after the Philippine Sin Tax Reform Act, overall cigarette consumption declined, but not uniformly across socioeconomic groups. Low-income smokers shifted toward more affordable substitutes, including cheaper cigarette brands or alternative nicotine products. Balbontin et al. (2020) found similar patterns in Southeast Asian contexts, where consumers adapt to tax and policy environments by changing product choices rather than quitting entirely.

The increasing popularity of vaping shows how many young people adjust their choices when new products become more accessible. Hu et al. (2018) documented significant increases in youth vaping as regulations evolved and products became more accessible. In the Philippines, research shows that flavored ENDS products have become highly popular among young adults, driven by perceived lower harm, modern aesthetics, and lower cost per use (Sangalang et al., 2021; Serra, 2023). This shift demonstrates how technological changes and product diversification influence consumption patterns, especially among urban youth.

Institutional policies also shape these behaviors. Shang et al. (2017) found that smoke-free environments and strong enforcement discourage smoking in public spaces but may not translate into lower overall consumption unless supported by consistent communication and cessation efforts. These findings emphasize that nicotine use among youth arises from an interplay of price, accessibility, product innovation, and institutional regulation.

Monthly Allowance

How much money a student has really affects how often they buy nicotine products and what kind they choose. For many young adults, college marks their first period of financial

autonomy, with monthly allowance serving as their primary source of disposable income.

According to Consumer Choice Theory, higher disposable income expands individuals' capacity to purchase discretionary goods, including nicotine products (Mankiw, 2021; Krugman & Wells, 2018).

Studies in the Philippine context support this relationship. Quimbo et al. (2020) found that Filipino youth with higher allowances are more likely to experiment with multiple nicotine products, including ENDS and premium cigarette brands. Sangalang et al. (2021) similarly reported that students with greater economic freedom show stronger patterns of dual use, combining vapes and cigarettes depending on price, convenience, and social setting. Economic inequality also shapes access to different types of products. Students with lower allowances may still consume nicotine but often resort to cheaper or illicit options, particularly in urban areas where informal vendors are common (Simbulan, 2021; DOH, 2020). The availability of low-cost tobacco and vape products in Manila, especially near university zones, ensures that even low-income students can maintain consumption despite rising taxes. In densely populated districts such as the Mendiola area, the concentration of retail stores, vape shops, and street vendors increases exposure and accessibility for all income levels (World Health Organization, 2021). Tan and dela Cruz (2020) note that financial access intersects with urban retail density to shape consumption patterns among young Filipinos, making allowance a critical predictor of use.

The literature therefore highlights that monthly allowance is not only a measure of purchasing power but also a key factor that influences product choice, frequency of use, and susceptibility to new nicotine technologies.

Institutional Anti-Smoking Policy

School rules about smoking help shape how students behave on campus, especially when these rules are clearly explained and enforced. These policies typically include designated smoke-free areas, communication of rules, penalties for violations, and educational campaigns. Research demonstrates that well-communicated and consistently enforced policies can reduce smoking prevalence on campus and shift social norms around nicotine use (Thrasher et al., 2012).

Studies on university environments reveal that institutional variation strongly affects policy outcomes. Some campuses enforce stringent monitoring and disciplinary actions, while others rely primarily on symbolic signage or general reminders (Pajarillo, 2019). Weak or inconsistent enforcement often leads to skepticism, reducing compliance and limiting the policy's reach (Simbulan, 2021). These findings suggest that the success of campus policies hinges on clarity, visibility, and credible enforcement mechanisms.

The literature also emphasizes the importance of policy clarity. Wackowski et al. (2016) and Lukowiak et al. (2014) found that students are more likely to comply with anti-smoking policies when rules are clearly communicated, easily accessible, and perceived as fair. In contrast, unclear boundaries, vague sanctions, or inconsistent messaging reduce the perceived legitimacy of policies and weaken their behavioral influence.

Educational outreach enhances these formal mechanisms. Trinidad et al. (2019) and Ickes et al. (2013) underscore the need for universities to integrate awareness campaigns, health education, and cessation support to reinforce smoke-free policies. Such components help students internalize the rationale behind regulations rather than merely avoiding penalties.

Given the regulatory complexity associated with vapes and emerging nicotine technologies, institutions face growing challenges in maintaining effective policy coverage. The Mendiola area, where the proliferation of nicotine retailers overlaps with campus boundaries, exemplifies how environmental and institutional factors interact to shape youth behavior (SEATCA, 2019; DOH, 2020).

Literature Review Summary

Table 1.

Literature Review Summary

Variable	Relationship with Nicotine Consumption	Supporting Studies	Key Findings	Philippine Context
Consumption of Nicotine-Based Goods	N/A	Mankiw (2018), Becker & Murphy (1988), Gallagher et al. (2020), Quimbo et al. (2016), Hu et al. (2018)	Price increases should reduce consumption (Law of Demand), but addiction (inelastic demand) and substitution to alternatives (vapes, HTPs) complicate patterns.	Substitution effect observed: shift from cigarettes to vapes/HTPs after tax increases (Quimbo et al., 2016; DOF, 2021).
Monthly Allowance	Positive	Quimbo et al. (2020), Sangalang et al. (2021), Simbulan (2021), White et al. (2018)	Higher monthly allowance increases likelihood and frequency of nicotine consumption; enables shift to premium products like vapes and HTPs.	Students with higher allowances sustain nicotine use and shift to vapes (Simbulan, 2021).
Anti-Smoking Policy	Negative	SEATCA (2019); Park et al. (2014); Lee et al. (2020);	Studies show that university campuses with clear smoking bans, consistent	DOH–CSC smoke-free policy exists, but enforcement

WHO (2018); Wackowski et al. (2016); DOH (2017; 2020); Lukowiak et al. (2014); Gonzalez & Salazar (2016)	enforcement, and supportive services (e.g., cessation programs, signage, peer support) report lower nicotine use and increased cessation. For instance, Lee et al. (2020) noted a 12–22% decrease in smoking prevalence; Gonzalez & Salazar (2016) found a 20% decline post-policy; and WHO (2018) emphasized school policy enforcement reduces youth smoking globally.	gaps around Mendiola area weaken effectiveness (Simbulan, 2021).
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Research Gaps

Across the literature, nicotine consumption among young people has been examined through various economic, behavioral, and institutional lenses. Studies have documented the rising popularity of emerging products such as vapes and heated tobacco (Goniewicz et al., 2014; Hu et al., 2018) and have consistently shown that accessibility, peer influence, and product appeal play central roles in shaping youth consumption patterns (Sangalang et al., 2021; Gatchalian et al., 2020). Economic studies grounded in the Income Effect and substitution behavior further demonstrate that students with higher discretionary resources tend to allocate more spending toward nicotine products, especially when these items are affordable and widely available in urban environments (Quimbo et al., 2020; Leonardo, 2021). Complementing these behavioral insights, institutional analysis emphasize the importance of clear, visible, and

consistently enforced anti-smoking policies in discouraging nicotine use within school environments (Fong et al., 2006; Ong & Glantz, 2014; Sarmiento, 2020).

Despite having many academic works on the matter, several important gaps remain unaddressed, particularly as they relate to the unique context of the Mendiola Consortium.

First, existing studies do not integrate economic factors and institutional policy perceptions within a single model when examining nicotine consumption among college students. Research focusing on economic determinants typically isolates income, allowance, or price elasticity as discrete predictors (Quimbo et al., 2020; Leonardo, 2021), while studies assessing institutional controls focus primarily on policy visibility, clarity, and enforcement (Fong et al., 2006; Ong & Glantz, 2014). Yet, as Becker and Murphy's (1988) Rational Addiction Theory suggests, consumption behavior is shaped simultaneously by economic capacity and by the institutional constraints that structure choice. No prior work in the reviewed literature examines how monthly allowance, policy clarity, and policy enforcement operate together as interconnected influences on students' nicotine spending. The absence of this integrated perspective limits the ability to fully understand the interplay between personal resources and institutional regulation.

Second, there is little empirical work evaluating the clarity and enforcement of institutional anti-smoking policies within the Mendiola district, despite notable differences in campus size, administrative structures, student culture, and enforcement mechanisms across its universities. Although the WHO FCTC, national legislation, and city ordinances have established broad regulatory frameworks (WHO, 2021; SEATCA, 2019), prior studies do not investigate how these policies are interpreted, communicated, or implemented at the campus level within Manila's university belt. Literature on institutional compliance suggests that clarity,

visibility, and consistency of rules are essential for influencing student behavior (Fong et al., 2006; Sarmiento, 2020), yet no published research specifically measures these dimensions among students from the Mendiola Consortium. Without understanding how students perceive campus policy clarity and enforcement, it is difficult to assess the effectiveness of institutional controls in shaping nicotine consumption.

Third, no existing study focuses on nicotine consumption within the Mendiola Consortium as a unique spatial and socio-institutional environment, even though the area is characterized by high student density, close proximity among universities, and the widespread availability of nicotine products from both formal retailers and informal vendors. Previous research on Filipino youth smoking patterns (Gatchalian et al., 2020; Sangalang et al., 2021) treats university students as a broad demographic group, without accounting for the contextual pressures that exist in tightly clustered academic districts such as Mendiola. Given that environmental accessibility and institutional boundaries jointly influence behavior, the absence of localized empirical data represents a significant gap. Investigating nicotine consumption specifically among students of San Beda University, Centro Escolar University, and La Consolacion College Manila provides an opportunity to produce context-sensitive findings that are not available in current literature.

Taken together, these gaps highlight the need for a localized and integrated analysis of how monthly allowance and institutional policy perceptions jointly influence the degree of nicotine consumption among college students in the Mendiola area. By addressing these research gaps, the present study contributes to a more comprehensive understanding of the economic and institutional factors that shape nicotine consumption within a unique educational and urban environment.

Chapter III

Theoretical Framework

This chapter presents the theoretical foundation of the study, including the theories used to explain the relationships among monthly allowance, perceived policy clarity, perceived policy enforcement, and nicotine consumption behavior among college students in the Mendiola Consortium. It also outlines the conceptual framework, operational framework, assumptions, hypotheses, and the definition of key terms used in the study.

Income Effects (Consumer Choice Theory)

The Income Effect, a key concept within Consumer Choice Theory, describes how changes in a consumer's income influence their purchasing decisions when prices remain constant. In the context of this study, a student's monthly allowance represents their primary form of disposable income and therefore determines their ability to allocate spending across both essential and discretionary goods. Nicotine-based products such as cigarettes, heated tobacco, and vapes fall under discretionary goods, and students with higher allowances are more capable of purchasing these items more frequently or selecting more expensive variants. This theoretical position aligns with the work of Mankiw (2021) and Krugman and Wells (2018), who assert that increases in income typically expand consumption choices.

Within an environment such as the Mendiola Consortium, where access to nicotine products is widespread and retail outlets are embedded within the urban setting, financial capacity becomes an enabling condition for nicotine use. Students with higher allowances are exposed to more opportunities to purchase both traditional cigarettes and emerging alternatives such as flavored ENDS products. This is consistent with empirical evidence showing that

Filipino youth with greater financial autonomy exhibit higher experimentation with nicotine products (Quimbo et al., 2020; Sangalang et al., 2021)

Conversely, students with limited allowances may still consume nicotine but are more likely to rely on cheaper or illicit alternatives such as single-stick cigarettes or unregulated vape refills sold by informal vendors. These products often evade excise taxes and regulatory controls, allowing low-income students to maintain consumption despite financial constraints (Simbulan, 2021; DOH, 2020). The Philippine Global Youth Tobacco Survey further notes that affordability remains a critical factor in youth tobacco use.

Overall, the income effect helps explain why nicotine consumption levels vary across students. Even when regulatory policies are in place, students with higher allowances may remain largely unaffected due to their ability to absorb costs or seek alternative retail sources. This theoretical foundation underscores the relevance of economic capacity as a predictor of nicotine use in higher education settings.

Rational Addiction Theory

Rational Addiction Theory, formulated by Becker and Murphy (1988), offers an economic perspective on addictive behavior by proposing that individuals make consumption decisions based on long-term utility maximization. Rather than viewing addiction as irrational, the theory argues that consumers weigh present benefits against future health and financial costs. The reinforcing nature of addiction also means that past consumption increases the likelihood of future consumption.

This theory is particularly relevant in explaining nicotine use among college students. Despite the health risks associated with smoking and vaping, students may continue to use nicotine for immediate psychological or social benefits, such as stress relief, enhanced

concentration, or belonging within peer groups. Even when institutional campaigns promote smoking cessation or when sin taxes raise product prices, students may still choose to consume nicotine if the short-term benefits outweigh the perceived long-term harms (Grossman, 2004; Quimbo et al., 2020)

In academic environments that combine high stress, social networks, and ease of nicotine access such as the Mendiola Consortium, Rational Addiction Theory predicts sustained consumption among students who derive ongoing utility from nicotine. This is further intensified for students with higher disposable income, who can comfortably absorb financial deterrents such as excise taxes. The theory also suggests that policy interventions focusing solely on economic deterrence may have limited impact, as habitual users have already incorporated nicotine into their utility-maximizing behavior.

Thus, Rational Addiction Theory provides a framework for understanding why students continue nicotine use despite awareness campaigns and regulatory restrictions, reinforcing the importance of integrating psychological and behavioral support in policy implementation.

Health Belief Model (HBM)

The Health Belief Model (HBM) explains health behavior through individuals' perceptions of susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. Originating from Rosenstock (1974) and further refined by Janz and Becker (1984), the HBM has been extensively applied in youth smoking research and public health interventions (Glanz et al., 2008; Carpenter, 2010).

In university settings, institutional anti-smoking policies function as external cues to action. These cues may take the form of visible no-smoking signage, enforcement protocols, educational campaigns, and peer-led initiatives. When students perceive high susceptibility to

nicotine-related health risks or believe that campus policies are credible and beneficial, they are more likely to reduce consumption or avoid nicotine use altogether. Conversely, when cues are weak, unclear, or inconsistently applied, perceived barriers such as peer influence or withdrawal symptoms may outweigh benefits and discourage compliance (Simbulan, 2021; SEATCA, 2019).

The HBM thus provides theoretical grounding for examining how policy clarity and enforcement shape student behavior. Clarity influences perceived benefits and susceptibility by ensuring that rules are understood, while enforcement influences perceived barriers and cues to action by establishing credible consequences for violations. These perceptions collectively contribute to whether policies lead to meaningful behavioral outcomes within the Mendiola Consortium.

Institutional Theory

Institutional Theory explores how organizations shape individual behavior through systems of rules, norms, and shared meanings. Initially developed in sociology and organizational studies, the theory argues that institutions influence action through three mechanisms: coercive pressures (rules and laws), normative pressures (social and professional expectations), and mimetic pressures (imitation of best practices) (DiMaggio & Powell, 1983; Scott, 2001). In health contexts, institutional arrangements affect compliance with policies, perception of behavioral norms, and long-term cultural alignment with health goals. Institutions do not simply regulate, normalize and legitimize certain behaviors over others.

Educational institutions, as formal organizations, are key actors in shaping health-related norms among youth. In the case of nicotine use, institutional policies such as tobacco-free campuses, mandatory health education, and cessation programs exert both coercive and

normative pressure on students. Where enforcement is strong and consistent, students internalize anti-smoking norms as part of campus culture. However, where policies exist without reinforcement or are inconsistently applied, their legitimacy diminishes. Studies show that perceived policy strength is correlated with lower smoking rates in schools (Graham & McNeill, 2015; Tan & dela Cruz, 2020).

This dynamic is evident across the Mendiola Consortium, where institutional variation in policy strength and health programming influences consumption behavior. Students attending schools with robust anti-smoking enforcement which include clear signage, disciplinary consequences, wellness campaigns are more likely to internalize tobacco avoidance as normative. Those in less proactive institutions may view such policies as symbolic or ignorable. From this, the following assumption can be derived: "Students in institutions with strongly enforced and culturally integrated anti-nicotine policies are less likely to engage in nicotine consumption." Institutional consistency and perceived authority are critical variables in whether policies translate to behavioral outcomes.

Institutional Theory also highlights the potential for positive behavioral diffusion. Institutions that model best practices, integrating policy enforcement with health education and peer engagement can influence surrounding institutions to adopt similar approaches. In this sense, the Mendiola Consortium could serve as a site for policy innovation, where effective institutional practices are replicated. Ultimately, this theory reinforces the need to assess not only the presence of policies but also the depth of institutional commitment, communication, and enforcement that makes policy meaningful in students' lived environments.

Conceptual Framework

Figure 1.

Determinants for cigarette consumption framework

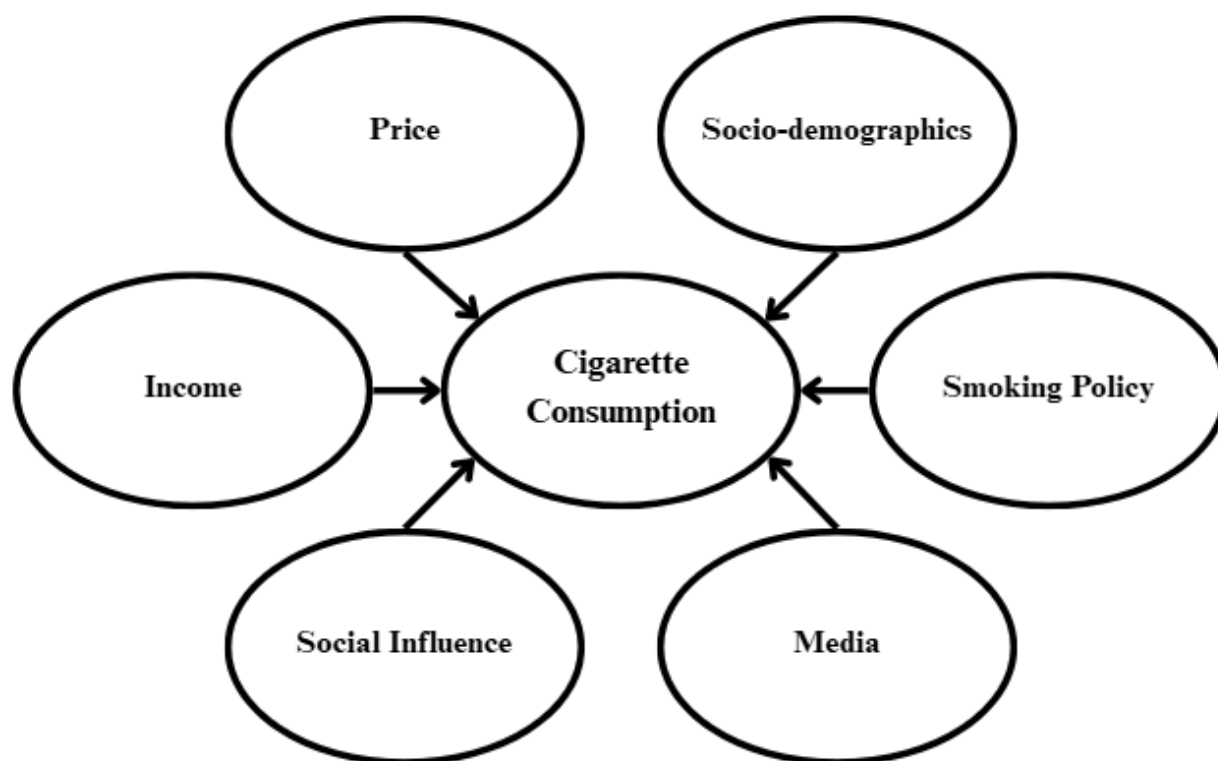


Figure 1 describes the framework by Preciados and Carcajente where it illustrates the multifaceted socio-economical determinants of cigarette consumption, positioning it at the center of six interconnected influences: price, income, socio-demographics, smoking policy, media, and social influence. Price is important because price rises, which are frequently caused by excise taxes, tend to lower cigarette usage, especially among price-sensitive populations like young people and those with low incomes. Income similarly affects smoking behavior; those with higher income levels may afford cigarettes more easily, while lower-income individuals may reduce consumption unless addiction overrides economic constraints. Socio-demographic factors like age, gender, education, and occupation further shape smoking patterns. For instance,

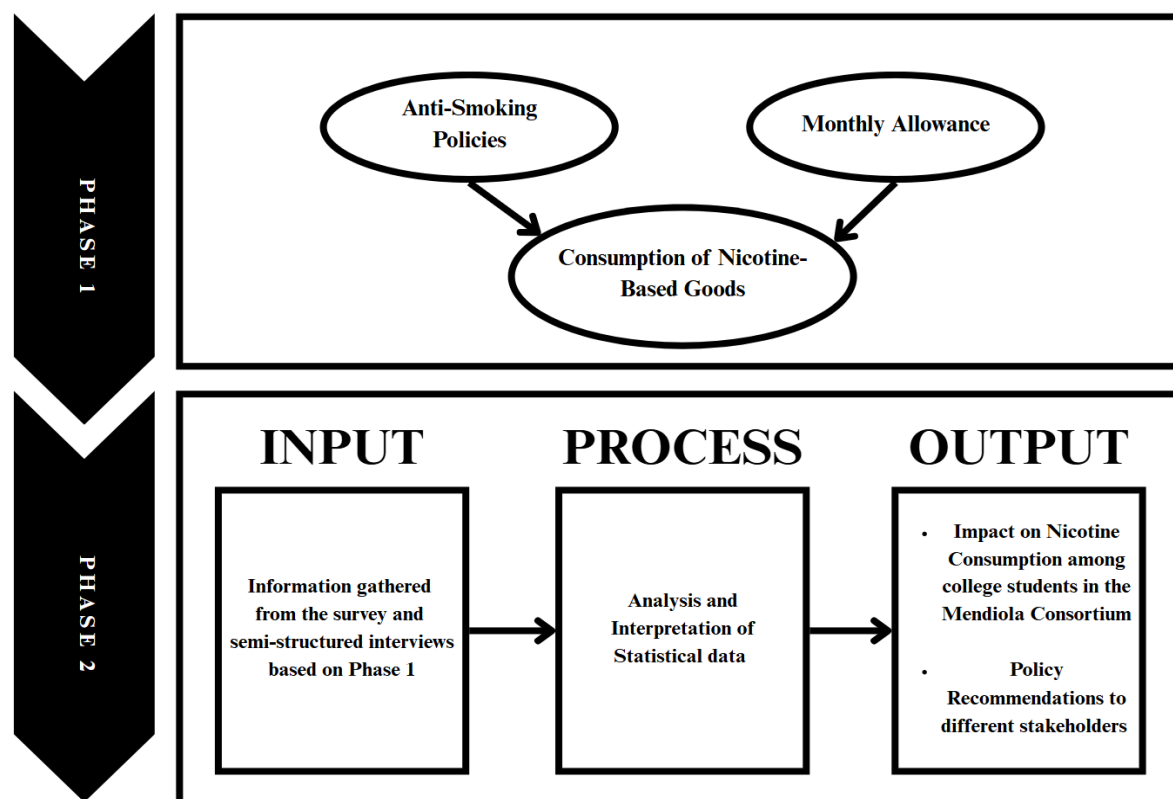
evidence shows that smoking prevalence is typically higher among males and individuals with lower educational attainment.

Smoking policies, including public smoking bans, advertising restrictions, and graphic health warnings, are institutional mechanisms designed to deter smoking by increasing its social and economic costs. Media exposure, particularly anti-smoking campaigns, can alter public perceptions and reduce cigarette use by highlighting its health consequences, whereas unregulated advertising may normalize or glamorize the habit. Lastly, social influence significantly impacts smoking behavior, as peer pressure and cultural norms often dictate the initiation and maintenance of smoking, especially among adolescents.

Operational Framework

Figure 2.

Proposed Operational Framework



The proposed operational framework for the study is derived from the conceptual framework of Preciados et al., (2017) and has been integrated into a structure of two distinct phases. Phase 1 establishes the conceptual foundation by identifying two primary factors influencing the consumption of nicotine-based goods: university anti-smoking policies, and income. Anti-smoking policies, which are divided into "Policy Clarity" and "Policy Enforcement," include two essential elements of school laws on their enforcement and communication, such as campus smoking bans or health education that either directly or indirectly discourage nicotine use. Monthly allowance represents the students' economic capacity, which affects their purchasing power and, consequently, their access to nicotine products, and shall be treated as is. These variables are theorized to directly influence the consumption patterns of nicotine among students.

Phase 2 operationalizes the study using the Input-Process-Output (IPO) model. Empirically, the IPO model has proven effective in studies dealing with behavioral and policy evaluation, particularly in public health and education research. For instance, in the study of Pajarillo (2019), the IPO model was utilized to examine the effectiveness of institutional anti-smoking campaigns among college students. The model facilitated the categorization of intervention strategies (inputs), implementation mechanisms (processes), and measurable behavioral changes (outputs), which mirrors this study's structural logic. The input consists of information gathered from surveys and semi-structured interviews conducted among students, guided by the conceptual insights from Phase 1. The process involves analyzing and interpreting the collected data using statistical methods to determine the relationships and effects of the identified variables. The output of the study has two main components: first, it provides an assessment of the impact of socio-economic and institutional factors on nicotine consumption

among students within the Mendiola Consortium; second, it provides policy recommendations aimed at different stakeholders, including public health authorities and academic institutions, to guide future policies and actions.

Statement of Assumptions

This study operates under several assumptions that guide the interpretation of the relationships among monthly allowance, policy clarity, policy enforcement, and the degree of nicotine consumption among students within the Mendiola Consortium. First, it is assumed that students report their weekly nicotine spending and monthly allowance truthfully and to the best of their ability. Since both variables rely on self-reported financial estimates, the accuracy of the data depends on the respondents' honesty and recall.

Second, it is assumed that students' perceptions of the clarity and enforcement of institutional anti-smoking policies reflect their actual experiences within their respective campuses. The study recognizes that institutional rules may be communicated and implemented differently across the member schools of the consortium, and therefore the subjective evaluations of clarity and enforcement are treated as valid indicators of each student's understanding of these policies.

Third, the study makes the assumption that the constructs assessed by the Likert-scale items, such as policy enforcement and clarity, are internally consistent depictions of students' opinions. The composite means derived from these items are assumed to reliably capture the underlying dimensions of institutional communication and enforcement intensity.

Finally, it is assumed that the three primary predictors, namely monthly allowance, perceived policy clarity, and perceived policy enforcement, are relevant and theoretically grounded determinants of student nicotine consumption behavior. These variables are treated as

the main influences on consumption within the scope of this study, acknowledging that other factors such as peer dynamics, stress, product preference, or marketing exposure exist but fall outside the boundaries of the present analysis.

Hypothesis

Based on the theoretical framework and research objectives, the following hypotheses are proposed:

H₀₁: There is no significant relationship between the monthly allowance of students and their level of nicotine consumption.

H₀₂: There is no significant relationship between students' perception of policy clarity and their level of nicotine consumption.

H₀₃: There is no significant relationship between students' perception of policy enforcement and their level of nicotine consumption.

Definition of Terms

Nicotine-Based Products: Includes traditional cigarettes, electronic nicotine delivery systems (ENDS or vapes), and heated tobacco products (HTPs), all subject to excise taxation in the Philippines.

Price Elasticity of Demand: An economic measure of how quantity demanded responds to changes in price. In the context of this study, it varies across income brackets and product types.

Income Effect: The change in consumption resulting from a change in real income due to higher product prices, especially significant among low-income consumers.

Rational Addiction: A theory suggesting that consumers of addictive goods make consumption decisions based on long-term utility maximization, even when aware of future health or financial costs.

Chapter IV

Methodology

This chapter outlines the methodological procedures that will guide the analysis presented in Chapter 5. It describes the research design, participants, sampling method, research instrument, data gathering process, and the statistical techniques that will be applied to address the study's objectives. Each methodological choice is grounded in established quantitative and econometric research principles to ensure that the analysis will be rigorous, appropriate for the structure of the data, and aligned with the theoretical framework of the study.

Research Design and Strategy

The study will adopt a quantitative descriptive–correlational research design. Quantitative approaches are appropriate when measuring relationships among variables in a structured manner (Creswell & Creswell, 2018), while a correlational framework allows for examining associations between multiple predictors and a behavioral outcome (Babbie, 2021). This design was chosen to determine how monthly allowance, policy clarity, and policy enforcement influence nicotine consumption behavior among college students in the Mendiola Consortium.

Given that nicotine consumption was measured through ordered weekly spending categories, the analysis required statistical techniques capable of handling ordinal outcomes. As recommended by Long and Freese (2014) and Wooldridge (2015), ordinal logistic regression (also called the proportional odds model) is the appropriate method for analyzing ordered categories where intervals between values cannot be assumed to be equal. For this reason, the descriptive–correlational design was integrated with an econometric model suited to the structure of the data.

To align the analytical approach with the structure of the dependent variable, the study employs an ordered logistic regression model. Weekly nicotine spending measured in four ordered categories, and the intervals between these categories cannot be assumed to be equal. As Long and Freese (2014) and Wooldridge (2015) emphasize, ordered logistic regression is most appropriate for ordinal outcomes of this nature because it preserves the ranking of categories without imposing linearity assumptions. This ensures that the analysis accurately reflects the gradations of nicotine consumption based on weekly spending.

Participants of the Study

For this study, the research will consist of college students and key institutional stakeholders from the Mendiola Consortium. To specify, the Mendiola Consortium consists of the universities located within the university-belt of Mendiola, which are San Beda University, Centro Escolar University, and La Consolacion College Manila (formerly included College of the Holy Spirit Manila). These institutions were selected due to their proximity to one another, shared academic and socio-cultural environment, and accessibility to similar institutional policies regarding student health and behavior.

Sampling Design

For the quantitative sampling design, this study adopts purposive quota sampling as its primary method for selecting participants. Purposive quota sampling enables the researcher to intentionally select individuals who possess specific characteristics that are essential to the objectives of the study (Palinkas et al., 2015). In this case, the participants will be college students from institutions within the Mendiola Consortium who are either current or former users of nicotine-based products such as cigarettes and vapes. An even quota will be set, making sure that an even distribution of college students from San Beda University, Centro Escolar

University, and La Consolacion College will serve as the respondents. To ensure ethical compliance, only students aged 18 years and above will be included in the sample. The purposive quota selection allows the researcher to focus on those most affected by or familiar with the issue, enabling deeper insight into the intersection of economic behavior, institutional policy, and nicotine consumption.

The proposed sample size of 150 participants is based on both methodological and practical considerations. While purposive sampling is non-random, this sample size supports the study's quantitative objectives by enabling the use of descriptive statistics, cross-tabulations, and regression analysis (Creswell & Creswell, 2018). A sample of this size allows for meaningful subgroup comparisons (e.g., by institution, gender, or awareness level) and meets the threshold for exploratory models using Likert-scale survey items. From a logistical standpoint, targeting 150 respondents is feasible given the number of participating schools. Ultimately, purposive quota sampling combined with this sample size ensures that the study will generate data-rich, contextually grounded, and analytically viable results while maintaining practical feasibility (Etikan et al., 2016; Creswell & Creswell, 2018).

Measurement and Instrumentation

The research instrument for this study is a structured survey questionnaire designed to capture four primary components: demographic profile, socio-economic status, nicotine consumption behavior, and perceptions of university anti-smoking policies. All questionnaire items, including the Likert-scale items used to measure policy clarity and enforcement, will appear in the appendix of this study. Consistent with best practices in behavioral survey design (Presser et al., 2004), the survey incorporates both factual and perceptual measures to allow for comprehensive quantitative modeling.

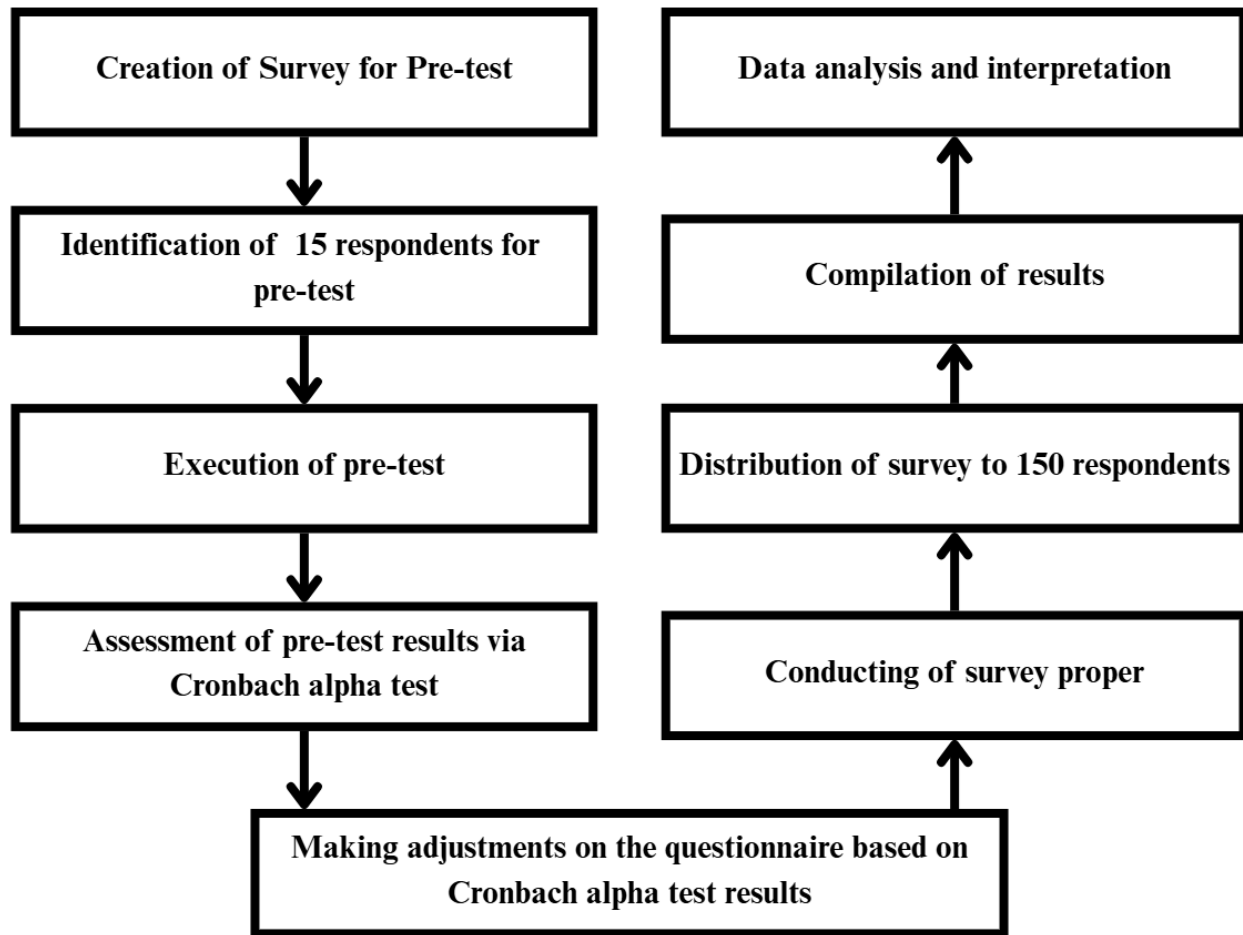
The dependent variable, Weekly nicotine spending, will be recorded in four categories: “Less than ₱100,” “₱100–₱299,” “₱300–₱599,” and “₱600 and above.” These categories will be recoded numerically from 1 to 4, forming the study’s ordinal dependent variable. The predictors, policy clarity and policy enforcement will be computed as composite mean scores derived from their respective Likert-scale items, each rated from 1 (strongly disagree) to 4 (strongly agree). The Likert scales follow an ascending order (1 to 4) because all items are to be positively worded; in such cases, higher numerical values should consistently represent stronger agreement or greater presence of the construct to preserve interpretive coherence and ensure that composite scores accurately reflect increasing levels of the underlying perception (Joshi et al., 2015). The internal consistency of the perception scales was evaluated using Cronbach’s alpha. According to Field (2013), a coefficient of 0.70 or higher indicates acceptable reliability for Likert-type constructs in social science research. This threshold ensures that the items within each scale measure a coherent underlying dimension rather than functioning independently. The pilot test showed that both the policy clarity and policy enforcement scales met this criterion, supporting their suitability for use in the final instrument and justifying the computation of composite mean scores for subsequent analysis. A Cronbach alpha test involving 30 respondents shall assess question clarity, flow, and comprehension. This will enable refinement of wording, sequencing, and scale instructions. The pretest ensured that respondents would interpret each item as intended, strengthening the overall validity of the instrument.

Research Procedures for Data Collection

The following presents the procedure of how the research will collect its data:

Figure 3.

Research Procedures for Data Collection

**Research Ethics and Approaches**

The study will strictly adhere to the ethical standards set by the Data Privacy Act of 2012 and institutional guidelines on human subject research. Participation will be voluntary, and respondents will be assured that they may withdraw from the study at any point without consequence. No identifying information will be recorded, and all responses will remain strictly confidential. The survey will include an informed consent section detailing the study's objectives, data usage, and confidentiality safeguards, ensuring that participants are properly informed before participating.

Data Analysis

Data analysis will be conducted in several stages, beginning with descriptive statistics to summarize demographic characteristics, socio-economic status, and patterns of nicotine use. Measures of central tendency and distribution will be computed for all major variables, including the composite perception indices. These descriptive findings will provide the contextual foundation for the regression analysis presented in Chapter 5.

To examine the relationships among the predictor variables, monthly allowance, policy clarity, and policy enforcement, and the ordinal dependent variable representing weekly nicotine spending, the study will employ ordered logistic regression. As noted by Long and Freese (2014), this model is ideal for ordinal outcomes due to its assumption of a latent continuous variable underlying the ordered categories. Furthermore, it preserves the ordinal structure of the dependent variable without imposing the unrealistic assumption of equal intervals required by OLS regression.

The econometric specification of the model is expressed as:

$$\log \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - \beta_1 X_1 - \beta_2 X_2 - \beta_3 X_3 \quad j = 1, 2, 3$$

Where:

- Y_j = Nicotine Consumption (Weekly Spending on Nicotine-based Products)
- X_1 = log-transformed Monthly Allowance
- X_2 = Policy Clarity Score
- X_3 = Policy Enforcement Score
- j = the index of each cumulative threshold in the ordinal logit model.

This structure draws from the approach used by DeCicca, Kenkel, and Mathios (2002), who used OLS to analyze the impact of tax policy and personal perceptions on youth smoking

behavior. Likert-scale variables will be treated as approximately interval-level data (Wooldridge, 2016), allowing their use as regressors in a linear model.

Although vape and cigarette products are taxed at different rates under Philippine law, this study treats nicotine consumption as a unified behavior, defined by combined weekly expenditure. Perceptions of sin tax effectiveness are thus interpreted broadly, referring to the perceived deterrent effect of taxation on nicotine use in general. This decision is grounded in both theoretical and behavioral considerations: students often substitute or combine nicotine products based on availability and price sensitivity, and typically respond to the overall environment of nicotine regulation rather than discrete tax instruments. Separating these categories could introduce confusion, reduce statistical power, and detract from the study's goal of assessing the general impact of policy awareness and perception on nicotine behavior among youth. This approach follows public health literature, which often treats regulation and cost-based deterrence as generalizable across forms of consumption (Chaloupka & Warner, 2000).

Before estimating the model, diagnostic tests will be conducted to ensure statistical robustness. Multicollinearity will be assessed using the Variance Inflation Factor, with values below conventional thresholds indicating acceptable independence among predictors. Model fit will be evaluated through the likelihood-ratio test, comparing the full model against a null model with no predictors. Additional comparisons to multinomial logistic regression using metrics such as AIC and BIC will help confirm the suitability of the ordered logit framework.

The findings of these analysis, along with their implications for the study's hypotheses, will be presented in detail in Chapter 5.

Chapter V

Results and Discussion

This chapter describes the statistical methods used in the study, the data analysis, and the interpretation of the findings. The gathered results enable the researcher to address the previously stated problem statements and draw a clear conclusion.

Reliability Test Results

Table 2.

Cronbach Alpha Test

	Test Result
The Perceived Effectiveness of Anti-Smoking Policies of College Students in the Mendiola Consortium	0.721

The first empirical result concerns the reliability test for the perception scales used in the study. The Cronbach Alpha value of 0.721 indicates acceptable internal consistency for the items measuring perceived clarity and enforcement of anti-smoking policies. Cronbach Alpha values above the 0.70 threshold are generally deemed reliable in social science research, as they reflect coherent measurement of a single construct. This means the Likert-scale items employed in the study were interpreted consistently by respondents and reliably captured their perceptions of institutional anti-smoking policies. This aligns with Field's (2018) guidelines for reliability testing and Presser et al.'s (2004) assertion that pretested survey questions typically achieve reliability scores above the minimum acceptable level.

Demographic Profile of Respondents

Table 3.

Descriptive Statistics for the Demographic Profile of Respondents

AGE	Total Frequence (n=150)	% of Total
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19	8	5.33%
20	9	6%
21	46	30.67%
22	47	31.33%
23	18	12%
24	10	6.67%
25	7	4.67%
28	5	3.33%
GENDER		
Female	72	48
Male	78	52

Following the reliability test, the demographic profile of respondents is presented. The majority of participants fall within the age bracket of 21 to 22, accounting for 62% of the sample. This age distribution aligns with the findings of the World Health Organization (2021), which indicate that nicotine experimentation peaks during early adulthood when individuals experience heightened independence, reduced parental oversight, and increased exposure to peer influence. This age group also corresponds to the period in which coping mechanisms and habitual behaviors solidify, making them particularly relevant to studies involving nicotine consumption. Gender distribution among respondents is nearly equal, with 52% male and 48% female. While global and Philippine studies have traditionally shown that males consume more nicotine, recent trends, including the growing popularity of vaping, suggest that nicotine use is becoming more gender-neutral in younger populations. A balanced gender sample thus strengthens the representativeness of the study.

Socio-economic Profile of Respondents

Table 4.

Descriptive Statistics for the Socio-economic Profile of Respondents

ESTIMATED MONTHLY ALLOWANCE	Total Frequency (n=150)	% of Total
Below ₱3,000	2	1.33%

₱3,000 - ₱4,999	26	17.33%
₱5,000-₱7,999	39	26%
₱8,000-₱9,999	24	16%
₱10,000-₱14,999	13	8.67%
₱15,000-₱19,999	20	13.33%
₱20,000 and above	26	17.33%
WEEKLY SPENDING ON NICOTINE-BASED PRODUCTS		
Less than ₱100	25	16.67%
₱100 - ₱299	23	15.33%
₱300 - ₱599	63	42%
₱600+	39	26%
CONSUMED PRODUCT NICOTINE-BASED PRODUCTS		
Vape	98	65.33%
Cigarette	21	14%
Vape and Cigarette	31	20.67%
YEAR LEVEL		
1 st Year	0	0%
2 nd Year	8	5.33%
3 rd Year	34	22.67%
4 th Year	108	72%
COLLEGE/UNIVERSITY		
Centro Escolar University	51	34%
La Consolacion College	48	32%
San Beda University	51	34%

The socio-economic profile of respondents further clarifies the context of nicotine consumption within the Mendiola Consortium. A majority of respondents receive a monthly allowance ranging from ₱5,000 to ₱20,000 and above. This level of financial support generates considerable disposable income, which, according to Consumer Choice Theory, increases an individual's ability to purchase discretionary goods such as nicotine products. Empirical studies by Quimbo et al. (2020), Sangalang et al. (2021), and White et al. (2018) similarly emphasize

that higher allowances correlate with higher frequency and diversity of nicotine use among young adults. This economic capacity directly affects both the quantity and type of nicotine consumed, which is further supported by the weekly spending patterns observed. Nearly half of the respondents spend ₱300 to ₱599 per week on nicotine products, suggesting regular and sustained consumption typical of users exhibiting moderate to high levels of dependence.

Rational Addiction Theory (Becker & Murphy, 1988) explains that once consumption becomes habitual, price increases, such as those imposed by sin taxes, have only a limited deterrent effect, particularly among individuals with sufficient financial resources.

The type of nicotine product consumed also reflects broader regional trends. The majority of respondents (65.33%) use vapes, followed by those who consume both vapes and cigarettes. This pattern is consistent with Southeast Asian data showing a shift from traditional cigarettes to electronic nicotine delivery systems due to lower perceived harm, greater accessibility, variety of flavors, and lower cost per use. The Global Youth Tobacco Survey and Hu et al. (2018) attribute the rise of vaping to its appeal among younger consumers, who view it as more socially acceptable compared to traditional smoking. This emerging preference for vapes has important implications for regulatory action, as ENDS products often fall outside the full scope of traditional tobacco control mechanisms.

Demographic Profile by Institution

Table 5.

Descriptive Statistics of Demographic Profile by Institution

INSTITUTION	Centro Escolar University (n=51)	La Consolacion College (n=48)	San Beda University (n=51)
AGE	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
19	1.96%	6.25%	7.84%

20	3.92%	10.42%	3.92%
21	25.49%	33.33%	33.33%
22	33.33%	33.33%	27.45%
23	17.65%	10.42%	7.84%
24	11.76%	0.00%	7.84%
25	3.92%	4.17%	5.88%
28	1.96%	2.08%	5.88%
GENDER			
Male	41.18%	56.25%	58.82%
Female	58.82%	43.75%	41.18%

The demographic profile per institution reveals that the majority of respondents across the Mendiola Consortium are aged 21 and 22, accounting for approximately 58.82% in CEU, 66.66% in La Consolacion College, and 60.78% in SBU. There is a distinct institutional variation in gender distribution. Centro Escolar University is predominantly female (58.82%), whereas La Consolacion College (56.25%) and San Beda University (58.82%) are predominantly male.

Socio-economic Profile by Institution

Table 6.

Descriptive Statistics of Socio-economic Profile by Institution

INSTITUTION	Centro Escolar University (n=51)	La Consolacion College (n=48)	San Beda University (n=51)
ESTIMATED MONTHLY ALLOWANCE	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)
Below ₱3,000	0.00%	0.00%	3.92%
₱3,000 - ₱4,999	17.65%	16.67%	17.65%
₱5,000-₱7,999	13.73%	35.42%	29.41%
₱8,000-₱9,999	15.69%	20.83%	11.76%
₱10,000-₱14,999	13.73%	6.25%	5.88%
₱15,000-₱19,999	15.69%	8.33%	15.69%
₱20,000 and above	23.53%	12.50%	15.69%

WEEKLY SPENDING ON NICOTINE-BASED PRODUCTS			
Less than ₱100	7.65%	16.67%	15.69%
₱100 - ₱299	13.73%	12.50%	19.61%
₱300 - ₱599	47.06%	43.75%	35.29%)
₱600+	21.57%	27.08%	29.41%
YEAR LEVEL			
2 nd Year	1.96%	2.08%	11.76%
3 rd Year	15.69%	39.58%	13.73%
4 th Year	82.35%	58.33%	74.51%

This socio-economic Profile by Institution highlights the diverse financial capacities within the consortium. CEU students exhibit the highest financial capacity, with 23.53% belonging to the highest allowance bracket (₱20,000 and above). Conversely, La Consolacion College shows a strong middle-income concentration, with 35.42% receiving between ₱5,000 and ₱7,999. Spending patterns are relatively consistent across the three schools, with the ₱300 - ₱599 bracket being the most frequent choice (reaching 47.06% in CEU). San Beda University has the highest percentage of heavy spenders (29.41% at ₱600+). The sample is heavily weighted toward 4th-year students, particularly in CEU (82.35%) and SBU (74.51%).

Perception of the Respondents on Policy Clarity

Table 7.

Descriptive Statistics for Respondents' Perception of Policy Clarity

Statement No.	Statement	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)	Mean	Verbal Form
1	I am aware that my school implements a campus-wide anti-smoking policy.	76	53	18	3	3.35	AGREE
2	The school clearly	62	55	24	9	3.13	AGREE

	communicates the rules and coverage of the anti-smoking policy.						
3	Information about anti-smoking policies is easily accessible (e.g., posted online or on bulletin boards).	46	66	28	10	2.99	AGREE
4	The school conducts campaigns, seminars, or announcements about anti-smoking regulations.	41	62	30	17	2.85	AGREE
5	The objectives and purpose of the school's anti-smoking policy are clearly explained to students.	29	74	38	9	2.82	AGREE
6	I feel that the school takes enough effort to raise awareness about its anti-smoking policy.	38	72	26	14	2.89	AGREE

The respondents' perceptions of policy clarity are summarized in Table 7. The mean scores, which range from 2.82 to 3.35, reveal a consistent but moderate level of agreement regarding institutional communication of anti-smoking policies. Students generally acknowledge the existence of campus-wide anti-smoking rules, but the moderate level of agreement suggests that communication efforts are insufficiently pervasive or compelling. The Health Belief Model posits that individuals require not only awareness but also a clear perception of benefits, severity,

and susceptibility before modifying behavior. The results indicate that, although policies are communicated, they may not be internalized by students at a meaningful level. This gap between awareness and behavioral change is consistent with Park et al. (2014), who found that students exposed to policy information without accompanying cues to action often fail to adjust their consumption behavior.

Perception of the Respondents on Policy Enforcement

Table 8.

Descriptive Statistics for Respondents' Perception of Policy Enforcement

Statement No.	Statement	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)	Mean	Verbal Form
1	The school enforces its anti-smoking policy consistently across all students.	46	60	35	9	2.95	AGREE
2	I often see students smoking on campus.	49	50	37	14	2.89	AGREE
3	Penalties for violations are clear and fairly implemented.	21	82	34	13	2.74	AGREE
4	I have witnessed or heard of students being penalized for violating anti-smoking rules.	27	62	38	23	2.62	AGREE
5	Most students comply with the school's	31	61	36	22	2.67	AGREE

6	anti-smoking policy. I believe the school's enforcement discourages students from smoking or vaping on campus.	31	61	51	7	2.77	AGREE
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The assessment of policy enforcement shown in Table 8 reveals a similar pattern. Mean values range from 2.62 to 2.95, suggesting that enforcement is present but not consistently perceived as strict or effective. Students report frequently seeing peers smoke or vape on campus, indicating gaps in monitoring and sanctions. This suggests that the school rules might exist mostly 'on paper' without being strongly enforced, wherein institutions implement policies in principle but fail to enforce them adequately in practice. Institutional Theory explains that policies require consistent monitoring and sanctions to achieve legitimacy. Without these, students may regard the rules as nominal rather than authoritative. Prior work by Simbulan (2021) observed similar inconsistencies in university environments, especially in urban zones with high commercial access to nicotine products, such as Mendiola.

Supplementary Variables (Influence of School Policies on Nicotine Consumption Behavior)

Table 9.

Descriptive Statistics of Supplementary Variables

Statement No.	Statement	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)	Mean	Verbal Form
1	The school's anti-smoking policy has influenced me to reduce my nicotine use.	33	34	46	37	2.42	DISAGREE

2	I smoke or vape less frequently within or near campus because of the school's policy.	42	37	48	23	2.65	AGREE
3	I am more conscious of my smoking/vaping habits due to awareness of the anti-smoking rules.	39	26	50	35	2.46	DISAGREE
4	My nicotine consumption tends to increase when I have a higher allowance or extra money.	39	45	39	27	2.64	AGREE
5	I would continue using nicotine products even if campus enforcement became stricter.	25	61	38	26	2.57	AGREE
6	The school's anti-smoking policy has made me more aware of the health risks of nicotine use.	38	61	38	13	2.82	AGREE

The supplementary variables in Table 9 further illuminate the interplay between institutional policies and nicotine consumption. While students moderately agree that they tend to smoke or vape less near campus due to policy presence, they disagree that the policy has led them to reduce their overall usage. This shows that students mainly adjust their behavior only in places where they might get caught but do not exhibit fundamental changes in consumption

behavior. Rational Addiction Theory accounts for this, which proposes that addicted people consider long-term costs but continue to engage in behavior when immediate utility outweighs perceived future harm. Students also agree that increased allowance leads to increased consumption, which directly supports the empirical findings in the regression analysis.

Ordinal Logistic Regression

Table 10.

Ordinal Logistic Regression Results

Variable	Coefficient	Std. Error	z-value	p-value	
log_Allowance	0.8233	0.2232	3.6887	0.000225	***
Policy Clarity	-0.4890	0.3238	-1.5102	0.131	
Policy Enforcement	-0.2011	0.4271	-0.4707	0.638	

The ordinal logistic regression results in Table 10 provide deeper insight into the direction and magnitude of the relationships. The coefficient for log-transformed monthly allowance is positive and statistically significant, indicating that increases in allowance are associated with higher odds of falling into a higher consumption category. This variable exhibits a strong effect size and a p-value well below 0.001, demonstrating that financial capacity is a robust predictor of nicotine consumption. In contrast, the coefficients for policy clarity and enforcement are negative but statistically insignificant. Although the negative coefficients imply a theoretical tendency for better policies to reduce consumption, the lack of statistical significance indicates that, in practice, these policies have not meaningfully influenced behavior within the sample. The insignificance aligns with the descriptive data, which show that while students acknowledge policy presence, they do not perceive it as compelling enough to alter habits formed around autonomy, peer environments, and disposable income.

Likelihood-Ratio Test

Table 11.

LR Test

Statistic	Value
Likelihood-Ratio Test	$\chi^2(3) = 18.84, p = 0.000296$

The LR test yields $\chi^2(3) = 18.84$ with $p = 0.000296$, which is less than 0.05, so we reject the null hypothesis, meaning the full regression model performs better than a model with no predictors. This confirms that the variables collectively contribute meaningful explanatory power to nicotine consumption patterns. The result supports the validity of including monthly allowance, policy clarity, and policy enforcement in the analysis, even though only allowance emerged as individually significant. The test indicates that nicotine consumption is not random but systematically related to observable characteristics, with financial capacity being the main driver. The result also strengthens the reliability of the model by showing that its predictive ability is robust and not dependent solely on chance. Overall, the likelihood-ratio test supports the conclusion that the regression model captures real behavioral relationships among the variables, particularly the strong influence of economic resources.

Variance Inflation Factor (VIF) Test

Table 12. VIF Test Results

Variable	VIF
log_Allowance	1.04
Policy Clarity	1.42
Policy Enforcement	1.43

Table 12 presents VIF values that are all well below common thresholds of 5, showing that there is no problematic multicollinearity among the predictors. This means the variables do not overlap excessively and each contributes unique information to the model. Because the VIF scores are low, the insignificance of policy clarity and enforcement cannot be attributed to

statistical interference or correlation with allowance but instead reflects their genuinely weak influence on nicotine consumption. The results indicate that economic and institutional variables operate independently in the model, allowing the regression coefficients to be interpreted with confidence. In effect, the VIF outcomes confirm that the study's findings are stable and that the strong impact of allowance is not an artifact of multicollinearity but a true behavioral pattern within the consortium.

Multinomial Logit (Comparison Model)

Table 13.

AIC/BIC Comparison

Model	AIC	BIC
Ordered logit	383.39	401.45
Multinomial logit	388.80	424.93

Table 13 compares the AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion) values of the ordered logit model and the multinomial logit model, and the results show that the ordered logit model provides a more efficient and parsimonious fit. AIC and BIC are model selection criteria that balance goodness-of-fit with model complexity. When comparing models on the same data, the model with the lower AIC or BIC is preferred, as it achieves better fit with fewer parameters. BIC penalizes complexity more heavily than AIC, so it generally favors simpler. The ordered logit model has lower AIC (383.39) and BIC (401.45) values compared to the multinomial logit model, which has higher scores on both criteria. Since lower AIC and BIC values indicate a better balance of model accuracy and simplicity, this confirms that the ordered logit model is the most appropriate statistical approach for analyzing nicotine consumption levels in the Mendiola Consortium. This makes theoretical sense because consumption categories in the study are ordinal in nature, meaning they follow a ranked structure

rather than independent categories. The comparison strengthens the validity of the study's methodology by showing that the chosen model is not only statistically sound but also maximizes predictive efficiency with fewer parameters. Overall, Table 13 reinforces confidence in the regression results by demonstrating that the selected analytical framework is both the most economical and the best-fitting option for the data.

Test of Hypothesis

Table 14.

Test of Hypothesis

Null Hypothesis (H_{01})	p-value	Result
There is no significant relationship between the monthly allowance of students and their level of nicotine consumption within the Mendiola Consortium.	0.000225	Reject
There is no significant relationship between students' perception of anti-smoking policy clarity.	0.131	Accept
There is no significant relationship between students' perception of anti-smoking policy enforcement.	0.638	Accept

The hypothesis tests further clarify the relationships among variables. Referring to Table 14, monthly allowance significantly influences nicotine consumption, leading to the rejection of the null hypothesis. In contrast, both policy clarity and policy enforcement show no significant relationship with nicotine consumption, which validates the acceptance of the corresponding null hypotheses. The significance level used was 0.05, and only the monthly allowance variable exhibited a p-value below this threshold. This finding reveals that, within the Mendiola Consortium, economic capacity exerts the strongest influence on nicotine-related behavior, whereas institutional policy mechanisms do not significantly contribute to changes in consumption.

Synthesis of Findings

The results of the study reveal a coherent pattern in which monthly allowance emerges as the most influential factor affecting nicotine consumption among students, while policy clarity and enforcement remain weak predictors of behavior. Descriptive data show that a large proportion of respondents receive moderate to high monthly allowances, which directly translates into greater spending on nicotine products, particularly vapes. The regression analysis confirms this trend by identifying monthly allowance as the only statistically significant predictor of consumption. In contrast, although students generally acknowledge the existence of anti-smoking policies and indicate moderate agreement that these are communicated and enforced, such awareness does not lead to significant reductions in nicotine use. This reflects a disconnect between institutional policy efforts and actual student behavior. The demographic characteristics of the respondents further support the findings, as most students belong to the age group associated with higher experimentation, autonomy, and peer influence. The strong preference for vaping mirrors broader national and regional trends that point to the popularity of electronic nicotine devices among young adults, driven by perceived lower harm, greater accessibility, and a wider range of flavors. Additional results also show that students tend to adjust their nicotine use only when they are near campus but continue their typical consumption outside these boundaries. Taken together, the findings indicate that nicotine consumption in the Mendiola Consortium is shaped primarily by financial capacity and personal motivations rather than by institutional efforts to regulate behavior.

Discussion in Relation to the Theoretical Framework

The findings of the study align closely with the theoretical framework that guided the analysis, particularly Consumer Choice Theory and Rational Addiction Theory, which

emphasize the role of economic resources in enabling continued consumption of addictive goods. The significant effect of monthly allowance supports these theories by demonstrating that students with higher financial capacity are more capable of sustaining nicotine use regardless of policy restrictions or health information. This indicates that economic access plays a central role in shaping how frequently and consistently students consume nicotine products. In contrast, the Health Belief Model helps explain why policy clarity and enforcement did not show significant influence on behavior. Although students are generally aware of campus anti-smoking policies, awareness alone does not translate into behavioral change unless individuals perceive strong cues to action and a heightened sense of personal risk. The moderate levels of agreement across policy-related items indicate that these essential components are weak within the Mendiola Consortium. Institutional Theory further clarifies this gap by suggesting that policies lose their ability to shape behavior when enforcement is inconsistent or viewed as symbolic rather than authoritative. The findings reveal that institutional structures within the consortium do not provide the level of monitoring or sanctioning necessary to create a meaningful deterrent effect. Overall, the theoretical framework illustrates why economic capacity exerts a strong influence on nicotine use while institutional policies have limited practical impact.

Comparison With Previous Studies

The results of this study are consistent with several local and international studies that highlight the growing influence of disposable income on nicotine consumption among youth. Similar to the findings of Quimbo et al. (2020) and White et al. (2018), this study confirms that higher allowances increase the likelihood of purchasing nicotine products, supporting the idea that financial capacity directly shapes consumption patterns. The dominance of vaping among respondents also aligns with the Global Youth Tobacco Survey and research by Hu et al. (2018),

both of which document the rapid rise of electronic nicotine products among young adults due to flavored variants, lower cost per use, and strong peer influence. Furthermore, the weak influence of policy clarity and enforcement echoes Simbulan's (2021) observations that university anti-smoking policies often function symbolically, with inconsistent monitoring and limited sanctions that fail to modify behavior. Prior literature has also emphasized that awareness of policies does not necessarily translate into reduced consumption unless accompanied by strong institutional cues, which mirrors the insignificant results for policy variables in this study. Collectively, the alignment with previous studies reinforces the validity of the findings and situates the Mendiola Consortium within broader national and regional trends in youth nicotine use.

Chapter VI

Summary, Conclusions, and Recommendations

This chapter synthesizes the major findings of the study and integrates them with the theoretical and empirical literature discussed in earlier chapters. It aims to provide a cohesive understanding of how monthly allowance, policy clarity, and policy enforcement influence the nicotine consumption behavior of college students within the Mendiola Consortium. The discussion weaves together descriptive results, supplementary variables, student perceptions, and econometric analysis to develop grounded conclusions and targeted recommendations.

Summary of Findings

The study's findings show a consistent pattern in which economic capacity emerges as the most powerful predictor of nicotine consumption. The demographic profile shows that most respondents are aged 21 to 22, the developmental stage when autonomy peaks and peer environments exert strong influence. Literature has long emphasized that early adulthood is a key period for establishing behavioral habits, including nicotine use, as young adults experience reduced parental oversight, increased independence, and exposure to stressors inherent in academic life (World Health Organization, 2021). Gender distribution was almost equal, mirroring recent national trends where vaping has contributed to narrowing gender gaps in nicotine consumption. According to Hu et al. (2018), the social acceptability and design-oriented appeal of electronic nicotine delivery systems (ENDS) have made them attractive to both male and female students, which is consistent with the finding that 65.33% of respondents consume vapes as their primary nicotine product.

In terms of socio-economic characteristics, most respondents receive allowances ranging from ₱5,000 to ₱20,000 and above, providing substantial disposable income. Consumer Choice

Theory posits that higher disposable income expands an individual's ability to purchase discretionary goods (Mankiw, 2021), and despite its addictive properties, nicotine is still consumed within the constraints of income and preference. Quimbo et al. (2020) similarly found that Filipino youth with higher allowances are more likely to experiment with premium or multiple nicotine products. This pattern is visible in the study: nearly half of the respondents spend ₱300 to ₱599 per week on nicotine, representing moderate to high-level consumption consistent with rational addiction dynamics (Becker & Murphy, 1988).

Perception data reveal that students moderately agree that their schools communicate anti-smoking rules, but the level of agreement does not reach the threshold necessary for policy internalization. Mean scores for policy clarity ranged from 2.82 to 3.35, indicating awareness but not deep engagement. While respondents observe signage, online postings, and reminders, many still perceive gaps in accessibility and relevance of communication. According to the Health Belief Model (Rosenstock, 1974), awareness alone does not translate into behavioral change unless students also perceive vulnerability, severity of consequences, and clear cues to action. Carpenter's (2010) meta-analysis supports this: preventive behaviors necessitate more than cognitive awareness; they necessitate motivational triggers, which students in the sample appear to lack.

Perceptions of policy enforcement exhibit a similar pattern. Mean scores from 2.62 to 2.95 suggest that students recognize the existence of enforcement mechanisms but do not perceive them as consistent or strict. Respondents report frequently seeing peers smoke or vape on campus, suggesting that monitoring is uneven and sanctions are applied inconsistently. This aligns with Simbulan's (2021) argument that many university policies in urban environments function "symbolically," with rules that exist in principle but lack the operational rigor needed to

influence behavior. Institutional Theory (DiMaggio & Powell, 1983) explains that policies must be consistently implemented to gain legitimacy; otherwise, students interpret them as formalities rather than authoritative rules.

The supplementary variables provide more nuanced insight into students' behavioral responses to institutional rules. Students disagreed that anti-smoking policies reduced their overall nicotine use (mean 2.42), yet they agreed that they smoke or vape less near or within campus boundaries (mean 2.65) to avoid penalties. This illustrates adaptive but not transformative behavior: students avoid detection rather than reducing consumption. Rational Addiction Theory supports this, which claims that people balance short-term benefits like stress relief or social bonding against long-term repercussions, and often choose short-term satisfaction despite awareness of health risks (Becker & Murphy, 1988). Notably, students also agreed that their nicotine use increases when they "have more money" (mean 2.64), directly supporting the regression results and reinforcing the significance of income elasticity among young consumers.

The ordinal logistic regression confirms that monthly allowance is the only statistically significant predictor of nicotine consumption ($\beta = 0.8233$, $p < 0.001$). Policy clarity ($p = 0.131$) and policy enforcement ($p = 0.638$), though negatively signed, are not statistically significant predictors. Their negative coefficients point in the theoretical direction of greater policies reducing consumption, but their insignificance shows minimal real-world influence. The model's overall significance ($\chi^2(3) = 18.84$, $p = 0.000296$) demonstrates that the predictors collectively hold explanatory value, but allowance overwhelmingly drives the variation.

Overall, the results show that students' nicotine use is mainly influenced by how much money they have, the people around them, and whether the rules are enforced in certain areas, rather than institutional deterrence.

Conclusions

Based on the integration of empirical results and theoretical frameworks, three overarching conclusions are drawn.

First, the study concludes that financial capacity is the most decisive factor influencing nicotine consumption among Mendiola students. The strong statistical significance of monthly allowance aligns with a broad body of literature indicating that youth consumption of addictive goods increases when financial constraints are loosened (Quimbo et al., 2020; Sangalang et al., 2021). The Income Effect suggests that individuals with higher allowances can more easily absorb the cost of nicotine products, especially vapes, which are widely accessible around the consortium. Rational Addiction Theory further explains that once nicotine habits are established, individuals continue consuming even as prices rise, provided they have the income to support the behavior. Thus, allowance serves as the primary enabling condition for nicotine use.

Second, The study suggests that school rules don't strongly affect how much students actually use nicotine, they mostly just change where they use it. Although respondents are aware of campus rules and agree that enforcement exists, their behaviors suggest that policies function more as boundary markers than behavioral interventions. Students adjust where they smoke, not whether they smoke. This "location-based compliance" is consistent with findings from Shang et al. (2017), who observed that smoke-free policies reduce visible smoking in designated areas but rarely translate to reduced aggregate consumption without robust enforcement and sustained educational efforts. The moderate agreement scores for both clarity and enforcement highlight shortcomings in communication strategies and monitoring efforts. Institutional Theory suggests that without consistent sanctions and credible authority, institutional rules lose their regulatory power.

Third, vaping has become deeply normalized among students in the Mendiola area. The dominance of ENDS products reflects broader regional trends and reinforces the idea that institutional policies have not adapted to the evolving nicotine landscape. As Foulds et al. (2006) and Serra (2023) emphasize, the modern appeal and perceived lower harm of vapes often make them exempt from traditional anti-smoking stigma. The normalization of vaping, combined with students' financial ability and the dense retail environment of Mendiola, creates a consumption ecosystem where policies have difficulty penetrating personal routines and social practices.

Recommendations

The findings point to the need for a multifaceted and evidence-grounded intervention strategy that recognizes the interplay between students' financial capacity, institutional structures, and behavioral motivations. Drawing from the study's theoretical framework and global best practices, the following recommendations are proposed.

Recommendations for Educational Institutions

The persistence of nicotine consumption despite policy presence suggests that current campus regulations function more symbolically than effectively. Institutional Theory argues that rules influence behavior only when institutions consistently implement coercive, normative, and mimetic pressures (DiMaggio & Powell, 1983; Scott, 2001). Therefore, institutions must strengthen the credibility of their policies.

Strengthen Monitoring and Enforcement in Hotspots.

Studies show that students are more likely to comply with anti-smoking rules when enforcement is visible, consistent, and predictable (Graham & McNeill, 2015; Wackowski et al., 2016). Universities such as those in Korea achieved measurable

declines in smoking behavior once monitoring was intensified around campus boundaries (Lee et al., 2020). This supports the recommendation to increase campus patrol presence, especially in known hotspots within the Mendiola area.

Standardize Sanctions Across the Consortium

Inconsistent enforcement creates “policy leakage,” weakening student deterrence.

International campus tobacco-free initiatives, particularly those under the International Tobacco Control (ITC) Project, emphasize uniformity of sanctions to maintain policy legitimacy (Fong et al., 2006). A consortium-wide standardized sanction system increases institutional cohesion and prompts normative compliance.

Create Anonymous Reporting Mechanisms

Anonymous reporting systems align with the Health Belief Model's (HBM) “cue to action” principle, enabling students to participate in enforcement without social cost (Carpenter, 2010). U.S. universities implementing digital reporting tools have observed improved compliance because students feel involved in maintaining smoke-free spaces.

Improve Messaging Through Behaviorally Informed Signage and Digital Communication

Behaviorally informed interventions, such as loss-framed communications, visible cues, and simple rule reminders, have successfully reduced on-site smoking on Mexican and Uruguayan campuses (Thrasher et al. 2012). Using signage derived from behavioral economics strengthens perceived susceptibility and benefits (HBM), improving policy clarity.

Provide Student-Centered Cessation Pathways

Research consistently shows that quit support (counseling, nicotine replacement therapy, peer groups) enhances policy effectiveness (Ickes et al., 2013; Trinidad et al., 2019).

Rational Addiction Theory explains that addicted individuals require alternative long-term utility sources to replace nicotine-driven satisfaction (Becker & Murphy, 1988).

Integrating counseling and peer support addresses both physiological dependence and social reinforcement.

Recommendations for Local Government Units (LGUs) and Regulatory Agencies

The urban context of the Mendiola Consortium plays a crucial role in shaping student nicotine access. The World Health Organization (2021) highlights that areas with high retailer density exhibit higher youth smoking and vaping prevalence.

Intensify Monitoring of Vape Shops and Informal Retailers

Evidence from Southeast Asia shows that illicit and informal markets thrive when enforcement is weak, contributing to stable youth consumption despite tax increases (Hu et al., 2018; DOH, 2020). LGU enforcement crackdowns in Singapore and Thailand significantly reduced youth access to flavored and disposable vapes. Manila LGUs must adopt similar monitoring models to address enforcement gaps.

Strictly Implement Retail Licensing Requirements

Studies in Latin America demonstrate that licensing systems, when strictly applied, decrease retailer density near schools (Chelwa et al., 2019). Enforcing licensing rules around Mendiola addresses environmental accessibility outlined in Institutional Theory.

Coordinate With BIR and DOH on Excise Tax Enforcement

Weak excise tax enforcement consistently leads to price distortions and product shifting (Quimbo et al., 2016; Department of Finance, 2023). Income Effect theory shows that if

cheap vapes remain widely available, youth consumption persists. Strengthened inter-agency collaboration ensures taxation policies effectively deter youth use.

Recommendations for the Academic Community

Peer influence is a dominant factor in youth nicotine behavior (Sangalang et al., 2021). Students interpret health messages more credibly when delivered by peers with shared experiences.

Develop Peer-Led Health Communication Programs

Peer-led education has been successfully applied in Turkey, the U.S., and the Philippines, showing increased receptiveness to cessation messaging (Nichter et al., 2011). This reinforces HBM's emphasis on *perceived norms and cues to action*.

Conduct Financial Awareness Workshops on Nicotine Spending

Economic studies show students underestimate cumulative spending on nicotine (Smith et al., 2019). When made aware, consumption declines temporarily because of increased perceived cost (Krugman & Wells, 2018). Workshops operationalize Consumer Choice Theory by altering perceived opportunity costs.

Recommendations for Future Researchers

Explore Additional Predictors (Peer Dynamics, Stress, Marketing Exposure)

The current findings support further investigation into variables commonly highlighted in international youth smoking research (Cohen et al., 2016; Foulds et al., 2006). These variables would deepen understanding of Rational Addiction pathways.

Use Qualitative Methods to Capture Motivations and Attitudes

Qualitative approaches such as interviews and focus groups enrich quantitative findings by revealing nuanced rationalizations (Palinkas et al., 2015; Guest et al., 2006). This responds to Institutional Theory's emphasis on subjective interpretation of rules.

Consider Time-Series Studies

Longitudinal tracking aligns with behavioral economics research on addiction progression (Grossman, 2004). Monitoring change over time improves causal inference.

Disaggregate Cigarette, Vape, and HTP Consumption in Future Models

International evidence shows that policy sensitivity varies across product types (Gallagher et al., 2020; Hu et al., 2018). Disaggregated modeling enhances policy specificity.

Final Synthesis

In sum, nicotine consumption in the Mendiola Consortium is shaped primarily by economic autonomy and personal motivations, with institutional policies influencing behavior only superficially. Students respond to policies by modifying the context of their consumption rather than the behavior itself, demonstrating adaptive strategies rather than deterrence-based reduction. The findings confirm that effective intervention involves more than just policy presence; it also necessitates persistent enforcement, focused communication, increased student engagement, and acknowledgment of the socioeconomic milieu that encourages nicotine use. By addressing these dimensions, institutions and policymakers can better align regulatory structures with the lived realities of students, ultimately fostering healthier campus environments.

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Appendix

Reliability Test: Cronbach's Alpha

Description	Values
# of Variables	18
Sum of Q _n Variances	16.44827586
Variance of Total Scores	51.56242568
Cronbach Alpha	0.7210616559

Consent Form and Survey Questionnaire

The Perceived Effectiveness of Anti-Smoking Policies of College Students in the Mendiola Consortium

Youth smoking in the Philippines remains a persistent public health concern, especially among young adults aged 18 to 24 who are vulnerable to long-term nicotine dependence. Despite national measures such as the Expanded Graphic Health Warning Law and higher sin taxes under RA 11346, smoking persists in adaptive forms, particularly with the rise of e-cigarettes marketed as safer alternatives (WHO, 2021). The 2021 Global Adult Tobacco Survey (GATS) reports an average smoking initiation age of 20.9, highlighting university years as a critical period influenced by autonomy, peer pressure, and financial factors. This study examines how university anti-smoking policies and students' monthly allowance affect nicotine consumption among students within the Mendiola Consortium in Manila, recognizing that policy effectiveness is often weakened by inconsistent enforcement, socio-economic constraints, and shifting consumption patterns. By focusing on this academic setting, the research aims to provide localized and data-driven insights to support more effective public health strategies.

Consent Form

You are invited to participate in this research study. The purpose of this study is to understand the effects and perceptions surrounding youth smoking behavior and related policies.

Participation in this study is **voluntary**. You may choose not to participate or withdraw at any time without any penalty or loss of benefits.

This survey is **anonymous** – **your name and any identifying information will not be collected**. All responses will be treated with **strict confidentiality** and used **only for academic purposes**.

In accordance with the **Data Privacy Act of 2012 (Republic Act No. 10173)**, your information will be handled responsibly and protected from unauthorized access, disclosure, or misuse. Data collected will be stored securely and accessible only to the researcher for analysis and reporting.

If you have any questions or concerns about this study, you may contact **Izaac Aquino (zacaquino6@gmail.com)** at any time.

By proceeding with the questionnaire, you acknowledge that: *

The purpose and procedures of this study have been clearly explained to you;

You voluntarily agree to participate; and

You understand that your identity will remain anonymous.

☐ I Agree to Participate

☐ I Do Not Agree to Participate

Section A: Demographic Profile

Age: _____

Gender:

☐ Male ☐ Female ☐ Prefer not to say

Year Level:

☐ 1st Year ☐ 2nd Year ☐ 3rd Year ☐ 4th Year or higher

Name of School:

☐ San Beda University ☐ Centro Escolar University ☐ La Consolacion College

Estimated Monthly Allowance:

☐ < ₱2,000 ☐ ₱2,000–₱4,999 ☐ ₱5,000–₱7,999 ☐ ₱8,000+

Smoking/Vaping Status: ☐ Current ☐ Former ☐ Occasional

Nicotine Products Consumed:

☐ Cigarettes ☐ Vapes/E-cigarettes ☐ HTPs ☐ Others: _____

Weekly Spending on Nicotine:

☐ < ₱100 ☐ ₱100–₱299 ☐ ₱300–₱599 ☐ ₱600+

Section B: Awareness of Anti-Smoking Policies

Scale: 1 – Strongly Disagree | 2 – Disagree | 3 – Agree | 4 – Strongly Agree

☐ I am aware that my school has a campus-wide anti-smoking policy.

☐ The anti-smoking policy was communicated clearly by the school.

☐ I have seen or read signage or materials regarding anti-smoking rules.

☐ I have attended any seminar, campaign, or event related to anti-smoking.

Section C: Perceived Effectiveness of Anti-Smoking Policies

Scale: 1 – Strongly Disagree | 2 – Disagree | 3 – Agree | 4 – Strongly Agree

☐ The policy discourages students from smoking or vaping on campus.

☐ The school enforces the policy consistently.

☐ Anti-smoking signage is visible and noticeable in school areas.

☐ Penalties or consequences are clearly communicated and applied.

☐ The presence of this policy affects my own nicotine use behavior.

Section D: Nicotine Consumption Behavior

Scale: 1 – Strongly Disagree | 2 – Disagree | 3 – Agree | 4 – Strongly Agree

☐ I smoke or vape more when I have more money.

☐ I often buy nicotine products from informal sources (street vendors or online).

☐ I've tried to reduce nicotine use because of school policies.

☐ I tend to buy cheaper nicotine products due to budget constraints.

☐ I believe I would still access nicotine products regardless of school policy.

Section E: Open-ended Question

Please describe your personal thoughts on your school's anti-smoking policies.

Google Collab: Coding of Econometric Model and Tests

```
# 1) Install/load required packages
pkgs <- c("dplyr","broom","car","VGAM","MASS","lmtest","pscl","nnet","tidyr","purrr")
install_if_missing <- function(p) if(!requireNamespace(p, quietly=TRUE)) install.packages(p, repos="https://cloud.r-project.org")
invisible(sapply(pkgs, install_if_missing))
library(dplyr); library(broom); library(car); library(VGAM); library(MASS)
library(lmtest); library(pscl); library(nnet); library(tidyr); library(purrr)

# 2) Load CSV from GitHub raw URL
url <- "https://raw.githubusercontent.com/apo-llo1/AQUINO_REGRESSION-MAIN/refs/heads/main/AQUINO_REGRESSION%20MAIN%20-%20Sheet1.csv"
df <- read.csv(url, stringsAsFactors = FALSE)

cat("Dataset loaded. Dimensions (rows, cols):", dim(df), "\n\n")
cat("Original column names:\n"); print(names(df))

# 3) SANITIZE COLUMN NAMES
names(df) <- make.names(names(df)) # replaces spaces, parentheses, special chars with .
cat("\nSanitized column names:\n"); print(names(df))

# 4) Log-transform allowance (re-introducing this step)
df$log_Allowance <- log(as.numeric(df$Estimated.Monthly.Allowance) + 1)

# 5) SET dependent variable and predictors
# Replace with sanitized column names
dv_name <- "Weekly.Spending.on.Nicotine.based.Products" # Corrected DV name
predictors <- c("log_Allowance", "Policy.Clarity", "Policy.Enforcement") # Corrected predictor names to use log_Allowance
```

```

▶ # Check they exist
missing_cols <- setdiff(c(dv_name, predictors), names(df))
if(length(missing_cols) > 0) stop(paste("Columns not found:", paste(missing_cols, collapse=" ")))

# Ensure DV is numeric / ordered factor
df[[dv_name]] <- as.numeric(df[[dv_name]])
df[[dv_name]] <- factor(df[[dv_name]], ordered=TRUE, levels=sort(unique(na.omit(df[[dv_name]]))))

cat("\nDV summary:\n"); print(table(df[[dv_name]], useNA="ifany"))

# Convert small-character predictors to factor
for(nm in predictors){
  if(is.character(df[[nm]]) && length(unique(na.omit(df[[nm]]))) <= 12){
    df[[nm]] <- factor(df[[nm]])
    cat("Coerced", nm, "to factor\n")
  }
}

# =====
# 6) Ordered Logit (polr)
formula_ord <- as.formula(paste(dv_name, "~", paste(predictors, collapse=" + ")))
cat("\nOrdered logit formula:\n"); print(formula_ord)
ord_model <- MASS::polr(formula_ord, data=df, Hess=TRUE, na.action=na.omit)
ord_sum <- summary(ord_model)
print(ord_sum)

# Compute p-values - REVISED using broom::tidy
ord_coef_table <- broom::tidy(ord_model) %>%
  dplyr::mutate(p = 2 * pnorm(abs(statistic), lower.tail = FALSE))
cat("\nOrdered logit coefficient table:\n"); print(ord_coef_table)

```

```

▶ # Likelihood ratio test & McFadden pseudo-R2
null_model <- MASS::polr(as.formula(paste(dv_name, "~1")), data=df, Hess=TRUE)
ll_full <- as.numeric(logLik(ord_model))
ll_null <- as.numeric(logLik(null_model))
lr_stat <- -2*(ll_null - ll_full)
lr_df <- attr(logLik(ord_model), "df") - attr(logLik(null_model), "df")
lr_p <- pchisq(lr_stat, df=lr_df, lower.tail=FALSE)
cat("\nLR test: stat =", lr_stat, " df =", lr_df, " p =", lr_p, "\n")
cat("McFadden pseudo-R2 =", round(1 - (ll_full/ll_null), 4), "\n")

# =====
# 7) Parallel-Lines Check
# Create binary outcomes
df$y1 <- as.integer(as.numeric(as.character(df[[dv_name]])) > 1)
df$y2 <- as.integer(as.numeric(as.character(df[[dv_name]])) > 2)
df$y3 <- as.integer(as.numeric(as.character(df[[dv_name]])) > 3)

glm1 <- glm(as.formula(paste("y1 ~", paste(predictors, collapse=" + "))), data=df, family=binomial)
glm2 <- glm(as.formula(paste("y2 ~", paste(predictors, collapse=" + "))), data=df, family=binomial)
glm3 <- glm(as.formula(paste("y3 ~", paste(predictors, collapse=" + "))), data=df, family=binomial)

coefs1 <- tidy(glm1) %>% dplyr::select(term, estimate) %>% rename(est_y1=estimate)
coefs2 <- tidy(glm2) %>% dplyr::select(term, estimate) %>% rename(est_y2=estimate)
coefs3 <- tidy(glm3) %>% dplyr::select(term, estimate) %>% rename(est_y3=estimate)
coef_compare <- purrr::reduce(list(coefs1, coefs2, coefs3), full_join, by="term") %>% filter(term != "(Intercept)")
cat("\nCoefficient comparison across y1/y2/y3:\n"); print(coef_compare)

# Odds ratios
coef_compare_or <- coef_compare %>% mutate(or_y1=exp(est_y1), or_y2=exp(est_y2), or_y3=exp(est_y3))
cat("\nOdds ratios across y1/y2/y3:\n"); print(coef_compare_or)

```

```

# =====
# 8) Multicollinearity: VIF

# Create a dummy numeric dependent variable for VIF calculation to avoid warnings
df$vif_dummy_dv <- as.numeric(df[[dv_name]])
# Use the dummy DV for lm_for_vif
lm_for_vif <- lm(as.formula(paste("vif_dummy_dv ~", paste(predictors, collapse=" + "))), data=df)

# Diagnostic for factor levels (potential cause of VIF issues if single level)
cat("\nUnique levels for Policy.Clarity:"); print(unique(na.omit(df$Policy.Clarity)))
cat("Unique levels for Policy.Enforcement:"); print(unique(na.omit(df$Policy.Enforcement)))

vif_results <- tryCatch(car::vif(lm_for_vif), error=function(e)e)
cat("\nVIF results:\n"); print(vif_results)

# =====
# 9) Generalized Ordered Logit (VGAM)
gologit <- tryCatch({
  vglm(as.formula(paste(dv_name, "~", paste(predictors, collapse=" + "))),
    family=cumulative(link="logitlink", parallel=FALSE),
    data=df)
}, error=function(e)e)
if(inherits(gologit,"error")){
  cat("VGAM generalized ordered logit failed:\n"); print(gologit)
}else{
  cat("\nVGAM summary (generalized ordered logit):\n"); print(summary(gologit))
}

# =====
# 10) Multinomial logit (nnet::multinom)
multinom_mod <- tryCatch({
  nnet::multinom(as.formula(paste(dv_name, "~", paste(predictors, collapse=" + "))), data=df, trace=FALSE)
}, error=function(e)e)
if(inherits(multinom_mod,"error")){
  cat("Multinomial logit failed:\n"); print(multinom_mod)
}else{
  cat("\nMultinomial logit summary:\n"); print(summary(multinom_mod))
  cat("AIC ordered:", AIC(ord_model), "AIC multinom:", AIC(multinom_mod), "\n")
  cat("BIC ordered:", BIC(ord_model), "BIC multinom:", BIC(multinom_mod), "\n")
}

# =====
# 11) Save outputs for thesis
write.csv(ord_coef_table, "ordered_logit_coefficients.csv", row.names=FALSE)
write.csv(coef_compare_ord, "parallel_lines_coef_compare_oddsratios.csv", row.names=FALSE)
if(!inherits(vif_results,"error")) write.csv(data.frame(var=names(vif_results), vif=as.numeric(vif_results)), "vif_results.csv", row.names=FALSE)
cat("\nCSV files saved: ordered_logit_coefficients.csv, parallel_lines_coef_compare_oddsratios.csv, vif_results.csv\n")
cat("\nScript complete. Outputs are ready for interpretation.\n")

```

Google Collab: Result of Econometric Model and Tests

```

... Dataset loaded. Dimensions (rows, cols):
    150 4

Original column names:
[1] "Weekly.Spending.on.Nicotine.based.Products"
[2] "Estimated.Monthly.Allowance"
[3] "Policy.Clarity"
[4] "Policy.Enforcement"

Sanitized column names:
[1] "Weekly.Spending.on.Nicotine.based.Products"
[2] "Estimated.Monthly.Allowance"
[3] "Policy.Clarity"
[4] "Policy.Enforcement"

DV summary:

  1  2  3  4
25 23 63 39

Ordered logit formula:
Weekly.Spending.on.Nicotine.based.Products ~ log_Allowance +
    Policy.Clarity + Policy.Enforcement
Call:
MASS::polr(formula = formula_ord, data = df, na.action = na.omit,
    Hess = TRUE)

Coefficients:
                Value Std. Error t value
log_Allowance    0.8233    0.2232  3.6887
Policy.Clarity  -0.4890    0.3238 -1.5102
Policy.Enforcement -0.2011    0.4271 -0.4707

```

```

*** Intercepts:
      Value Std. Error t value
1|2  3.6897  2.1316    1.7310
2|3  4.6074  2.1404    2.1527
3|4  6.5933  2.1850    3.0176

Residual Deviance: 371.3857
AIC: 383.3857

Ordered logit coefficient table:
# A tibble: 6 × 6
  term          estimate std.error statistic coef.type      p
  <chr>          <dbl>    <dbl>    <dbl> <chr>    <dbl>
1 log_Allowance    0.823    0.223     3.69 coefficient 0.000225
2 Policy.Clarity  -0.489    0.324    -1.51 coefficient 0.131
3 Policy.Enforcement -0.201    0.427    -0.471 coefficient 0.638
4 1|2              3.69    2.13     1.73 scale    0.0835
5 2|3              4.61    2.14     2.15 scale    0.0313
6 3|4              6.59    2.18     3.02 scale    0.00255

```

```

LR test: stat = 18.83556 df = 3 p = 0.0002956585
McFadden pseudo-R2 = 0.0483

```

```

Residual Deviance: 364.7989
AIC: 388.7989
AIC ordered: 383.3857 AIC multinom: 388.7989
BIC ordered: 401.4495 BIC multinom: 424.9265

```