CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Tropical AgriSciences

From Aromatic Pleasure to Health and Environmental Concerns in the Philippines

MASTER'S THESIS

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Objectives of thesis

The main purpose of this study is to detect and understand the relationship between the impact of coffee consumption among young consumers on health and environmental aspects
The research seeks to accomplish the following specific objectives by focusing on the context of the Philippines:
1. Examine the Health Consequences: Investigate the link between sweetened coffee intake and obesity.
2. Assess the Environmental Impact: Evaluate the prevalence of overuse of plastic cups in coffee consumption.
3. Understand Behavioural Factors: Inquire about the motives and barriers that influence individuals' decisions about sugary coffee intake and the use of disposable plastic cups.

Methodology

This master's thesis investigates the health and environmental impacts of the consumption of sweetened coffee among young consumers in the Philippines.

A structured questionnaire will be used as the study's methodological approach. The data will be collected via an online questionnaire survey of students of the Visayas State University (the Philippines).

A multi-dimensional approach to analyzing the factors that influence the attitudes toward sweet coffee consumption will be applied. The data collection will be focused on examining consumers' awareness of potential health impacts and investigating the relationship between obesity, usage of plastic cups, and sugary coffee consumption. The impacts of socioeconomic factors on attitudes and awareness will be also evaluated.

The proposed extent of the thesis

50 pages

Keywords

Coffee arabica, SE Asia, drinking habits, sugar, health issues, plastic cups usage

Recommended information sources

Liu, C., Thang Nguyen, T. and Ishimura, Y. (2021). Current situation and key challenges on the use of single-use plastic in Hanoi.

Surma, S. and Oparil, S. (2021). Coffee and Arterial Hypertension.

Thomson, N. et al. (2017). Country context, personal values and nutrition trust: Associations with perceptions of beverage healthiness in five countries in the Asia Pacific region.

Tumanan, M.A.R. and Lansangan, J.R.G. (2012). More than just a cuppa coffee: A multi-dimensional approach towards analyzing the factors that define place attachment.

Utama, A. et al. (2021). Influences of Product Attributes and Lifestyles on Consumer Behavior: A Case Study of Coffee Consumption in Indonesia.

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Declaration

I hereby declare that I have done this thesis entitled From Aromatic Pleasure to Health and Environmental Concerns in the Philippines independently, all texts in this thesis are original, and all the sources have been quoted and acknowledged using complete references and according to Citation rules of the FTA.

In Prague 24.04.2024.

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Acknowledgements

Abstract

The global consumption of coffee has increased significantly, becoming an integral part of everyday life and a key economic factor. However, in the Philippines, there are concerns about the potential health impacts of coffee consumption, particularly the popularity of sweetened coffee, obesity rates and environmental issues such as plastic waste, which exacerbate environmental problems. The main aim of this study was to explore the complex links between coffee consumption, obesity and the environmental impact of single-use plastics in the Philippines. A cross-sectional survey was conducted online, involving 301 respondents, using convenience sampling method of data collection. Data were analysed using descriptive statistics, Mann-Whitney U test for rural-urban and gender differences, ANOVA for group comparisons with BMI of the respondents, and multiple regression to analyse the motivating factors of coffee consumption. The findings revealed non-significant gender differences in motivation to consume coffee, however, significant differences between rural and urban respondents. From the environmental point of view, urban residents demonstrated a willingness to bring their own cups in order to receive discounts, yet they were increasingly utilising disposable plastic cups, particularly women. In contrast, rural areas exhibited higher rates of personal cup use. Furthermore, individuals in the higher obesity and BMI groups were significantly concerned about the healthfulness of sweetened coffee, which correlated with increased awareness of obesity and its health effects. Overall, gender was found to have a significant negative association with motivation to consume coffee, whereas sweetening coffee had a positive association. In addition, awareness of the health consequences and negative effects of black coffee was found to have a significant positive association, highlighting the key role of health considerations in influencing coffee consumption behaviour.

In the context of global coffee consumption trends, this study illuminated the intricate interplay of individual behaviours, societal health concerns, and environmental stewardship. It provided insights for fostering sustainable practices in the Philippines.

Keywords: Caffeine consumption, environment, health issues, obesity, plastics, Visayas State University

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1.   Introduction

Coffee is widely consumed globally, second only to water. It has taken on many different forms, often with added sweetness to cater to diverse tastes. Coffee is enjoyed as a daily source of energy and a means of socializing, while also playing a significant role in cultural traditions and economic growth. The global consumption of coffee is on the rise, and this trend is also noticeable in the Philippines, where coffee has become an essential part of daily life (Surma & Oparil 2021; Cote et al. 2020).

The coffee industry has a significant impact, spanning from urban centres to coffee-growing areas, creating a vast and intricate supply chain. The coffee industry is characterised by a continuous drive for innovation in consumption methods and an ever-growing emphasis on sustainability across economic, social, and environmental domains. These trends are contributing to the expansion of the coffee market, as demonstrated by notable rises in global consumption. The International Coffee Organization reports that global coffee consumption increased by 3.7% in 2019 compared to the previous year. It is worth noting that Asia and Oceania experienced an annual growth of approximately 4.6%, which reflects the growing coffee culture in traditionally non-coffee drinking regions (ICO 2021; Surma & Oparil 2021).

There has been a noticeable shift in coffee consumption habits in the Philippines in recent years. It has been observed that Filipinos are gradually integrating coffee into their daily routines. This increase in consumption has been accompanied by a heightened awareness of the potential health benefits of coffee, such as its ability to reduce the risk of chronic diseases like cardiovascular illnesses and diabetes. However, there are concerns regarding the health implications of certain sugar-enhanced coffee beverages. Studies from Lipoeto & Agdeppa (2013) have suggested that these drinks may be contributing to the increasing rates of obesity in the country.

Furthermore, there is growing awareness of the coffee industry's environmental impact, particularly its use of single-use plastics, which has become a significant concern. The Philippines is among the countries that contribute significantly to oceanic plastic waste, and it is currently facing pressing environmental challenges that are intertwined with consumer behaviour and industrial practices. The coffee industry's frequent use of

disposable plastic cups has been under scrutiny due to its detrimental effects on pollution, resource depletion, and long-term sustainability (Geyer et al. 2019; Paler et al. 2019; Jambeck et al. 2015).

The objective of this paper was to examine the interrelated dynamics of coffee consumption, obesity, and the environmental impact of disposable plastic cups in the Philippines. The study aimed to provide a comprehensive understanding of the implications of these complex relationships for individuals, communities, the wider environment, and public health. The aim of this research was to inform and promote sustainable practices and provide strategic directions to address health and environmental sustainability challenges (Mathis et al. 2022).

While there is ample evidence linking diet to obesity, there is a significant knowledge gap regarding the impact of sugary coffee on weight gain and obesity risk, as well as the harmful effects associated with single-use plastic cups. This study aimed to fill the information gap by examining the relationships between sweetened coffee consumption, the health effects of coffee drinking, environmental problems associated with plastic cups, and the prevalence of obesity in the Filipino population.

2.   Literature Review

As coffee gains popularity worldwide, attention is also being paid to its wider implications, including not only health but also environmental sustainability. Consumers are becoming more conscious of the environmental impact of their consumption, particularly the excessive use of disposable coffee cups, which significantly contribute to global waste. Simultaneously, there is an increasing interest in maintaining a healthy lifestyle, which involves considering dietary choices such as coffee consumption.

A comprehensive review of the literature reveals that while many studies have examined the health effects of coffee, including its advantages and disadvantages, and the environmental impact of coffee-related waste, few have successfully connected these factors. Most research tends to separate health aspects from environmental impacts. A holistic view that considers the interrelationship between these factors is neglected. For example, the role of coffee consumption in promoting a lifestyle that balances personal health and environmental sustainability is underexplored.

This gap indicates an important area for further investigation: how coffee consumption affects both health outcomes and environmental sustainability. It is important to explore the synergies between coffee-related health practices and environmental impacts to understand the relationships between them.

2.1.   Attitudes to coffee consumption

Drinking coffee is not just about consuming the beverage itself. It involves pleasure, lifestyle, and status in society. The evolution in consumer behaviour has been made possible by three characteristics that distinguish the consumer product coffee: enjoyment, health, and sustainability over the long term (Samoggia et al. 2018; Global Coffee Forum 2015). Table 1 provides a summary of the factors that influence coffee consumption.

Worldwide, coffee consumption is on the rise, with significant regional variations. In the United States, the largest consumer of coffee, an estimated 26,982 thousand 60kg bags will be consumed in 2020-21. Brazil is a close second, consuming 22,400 thousand 60kg bags. Approximately 42 million 60kg bags of coffee are consumed annually in the

European Union, with Finland being the world's highest per capita coffee consumer, which is approximately 12 kilograms of coffee per year (International Coffee Organization 2021; Samoggia et al. 2018).

The Philippines is experiencing remarkable growth in coffee consumption in Asia. In 2021, Filipinos consumed an average of 3.05 kilograms of coffee per person. It is predicted that this figure will increase to 3.78 kilograms per person by 2025, reflecting a broader shift in dietary habits and an emerging preference for coffee over traditional local beverages. The coffee market in the country is expected to grow significantly, driven by the population's growing affection for coffee and rising living standards that allow for greater spending on coffee (ICO 2021; Surma & Oparil 2021).

2.1.1. Influencing factors

Consumers' health beliefs play a key role in shaping attitudes towards coffee consumption. There is a dichotomy in perceptions of coffee, with coffee both valued for its beneficial properties, such as increased energy and mental clarity (Samoggia et al. 2019), and criticised for the potential health risks associated with excessive consumption, including anxiety and insomnia (Lee et al. 2015). Furthermore, attitudes by gender reveal nuances in health-related coffee consumption. For example, Aguirre (2016) highlights that gender is an important determinant of coffee-drinking behaviour, with women more likely than men to prioritise health-related motives. This complex interplay suggests that educating consumers about the health impacts of coffee is key and can significantly influence market trends, as consumers seek to align their health beliefs with their coffee consumption habits.

Environmental issues and sustainability have become an integral part of coffee consumption decisions. With growing awareness of the environmental footprint of coffee production, consumers have a strong preference for brands that are committed to sustainable practices. This shift is also reflected in the growing trend towards products such as fair trade and organic coffee, which are seen as more environmentally friendly and ethical (Andorfer & Liebe 2015). In addition, the story of coffee presented by companies is often similar to that of luxury goods, where sustainability is part of the quality experience (Euromonitor International 2017).

On the other hand, according to a study on the motives behind caffeine consumption in different beverages such as tea, coffee and energy drinks, the result showed that taste is equal and important for all types of caffeine consumers. Bhumiratana et al. (2014) showed that the taste motive is related to the emotion type called 'positive-lower energy feelings', where consumers want to discover pleasant emotions associated with pleasure and sensory enjoyment. Similar research by Labbe et al. (2015) shows that consumers who consume coffee for sensory pleasure place more importance on the smell and taste of coffee, and find the experience much more enjoyable. For example, Richelieu and Korai (2014) found that visitors to coffee shops are more associated with the feeling of pleasure, in contrast to Aguirre (2016), who pointed out that taste motives appear in up to the eighth place among all the elements that influence drinking behaviour. Other elements are to stay awake, to improve work performance and for feelings of a focused mental state such as being motivated, in control, productive or clear-minded (Ágoston et al. 2017; Spinelli et al. 2017; Aguirre 2016; Bhumiratana et al. 2014; Hsu & Hung 2005).

Personal preferences determine not only the type of coffee consumed but also the way it is consumed, illustrating the depth of individuality in coffee preferences (Samoggia et al. 2020). The different flavour profiles of coffee, ranging from strong bitterness preferred by some to mild acidity preferred by others, highlight the role of individual taste in coffee selection. Lifestyle choices, such as the time of day when coffee is consumed or the choice between a quick espresso and a quiet latte, further individualise coffee consumption patterns (Sousa et al. 2016).

Social and cultural aspects are deeply woven into the fabric of coffee consumption, influencing not only the types of coffee preferred but also when and how they are consumed (Samoggia et al. 2018). Coffee's role as a social lubricant is manifested in different cultures, where different rituals and customs accompany its consumption. In many societies, coffee drinking is a communal activity that promotes social interaction and is embedded in daily routines (Richelieu & Korai 2014; Bookman 2013).

Furthermore, gender differences in coffee consumption have been observed, with men reportedly consuming more speciality coffees than women, suggesting that cultural norms intersect with individual preferences. Recognising these social and cultural differences is essential for coffee brands looking to build a loyal customer base and adapt to local and global market trends (Van der Merwe & Maree 2016).

The landscape of coffee buying trends and innovations is constantly changing, with a clear trend towards quality, artisanal experiences and convenience (Euromonitor International 2021). The speciality coffee movement, which emphasises flavours and high-quality coffee, is gaining strength, leading consumers to seek out unique coffee experiences (World Coffee Portal 2021). Innovations in coffee brewing technology, such as the rise of single-serve coffee capsules and sophisticated home coffee machines, reflect a shift towards convenience without compromising on quality. As a result, the industry is seeing demand for both high-end, quality-focused coffee products and those that offer a quick and convenient caffeine fix, suggesting diverse opportunities for market growth and consumer engagement (Lanfranchi et al. 2016; Sousa et al. 2016).

2.1.2.   Buying behaviour

Coffee marketing strategies are a dynamic combination of health messages, convenience promotion and emotional targeting that resonate with different consumer groups. Influencer endorsement, engaging content and compelling brand experiences play an important role in shaping how consumers perceive and choose coffee (Samoggia et al. 2020). Brandenburger (2023) emphasises that targeted messaging that plays to these diverse consumer preferences can effectively drive coffee consumption and increase market engagement.

Price sensitivity is a key factor in consumer behaviour towards coffee, especially when it comes to sustainable and speciality coffee. Consumers show a willingness to pay more for coffee with sustainability labels or unique characteristics that indicate higher quality (Sepúlveda et al. 2016; Lee et al. 2015). However, the price of fair trade products is often a barrier, suggesting a tension between ethical commitments and personal financial considerations (Cailleba & Casteran 2010). The price elasticity of speciality coffee suggests that price increases may discourage purchases, suggesting that affordability remains an important factor (Andorfer & Liebe 2015).

The influence of brand reputation and consumer loyalty on coffee purchases cannot be overstated. In a coffee market characterised by a plethora of choices, consumers have gravitated towards brands that have built strong reputations and generated consumer in the minds of consumers, resulting in a loyal customer base that values both the brand image and the consistent quality it represents.

The growing trend towards home brewing reflects a shift towards personalised coffee experiences and highlights the importance of accessibility and convenience. In addition, consumers' coffee shop experiences significantly influence preferences, suggesting that the location and environment of coffee consumption are as important as the beverage itself. The physical environment of coffee shops contributes to the overall sensory experience and can therefore significantly influence consumer behaviour (Schneider et al. 2020; Lee et al. 2015)

2.1.3.   Quality parameters

Freshness, health aspects, preparation procedures, sensory characteristics, aroma, and texture are all important factors in determining customer preferences and perceptions of coffee. Preference for freshly roasted coffee beans is frequently related with improved flavor quality, with freshness playing an important role in influencing consumer satisfaction (Spence & Carvalho 2020). Consumers carefully analyze the potential health advantages and dangers of coffee intake (Samoggia & Riedel 2019). The complexity of coffee preparation, such as bean selection, roasting grade, temperature, and brewing time, influences the flavour profile and strength of coffee, and hence the entire consumer experience (Caprioli et al. 2015). Furthermore, sensory experience, notably flavour and acidity, is a significant element in customer choice since it directly determines the perceived quality and enjoyment of the beverage (Samoggia et al. 2020). Coffee scent is also an important factor in how consumers perceive and enjoy coffee, according to a number of studies (Labbe et al. 2015). Finally, the texture or taste of coffee, which is affected by the brewing technique and the quality of the beans, is crucial to customer preferences since it contributes to the tactile experience of drinking coffee.

2.1.4.   Socio-economic factors

Socio-economic factors such as education level, household size and income have a significant impact on coffee consumption. Individuals with higher levels of education often show more interest in the ethical and sustainable aspects of coffee production, which is reflected in a preference for fair trade and organic varieties (Aksoy et al. 2019). Conversely, household size determines consumption volumes and coffee preparation preferences, with larger households gravitating towards bulk purchases and convenient

preparation methods to meet collective needs (Singh & Gupta 2020; Koman et al. 2019). Income level not only influences the ability to purchase premium coffee products but also shapes consumer choice, with wealthier segments of the population often associating more expensive coffee with social status and luxury experiences (Laurico et al. 2021).

Nationality and cultural background dictate different rituals and preferences in coffee consumption, demonstrating the diversity of global coffee culture. These preferences are manifested in preferred flavours, preparation techniques, and ritual aspects of coffee consumption that are unique to different cultures. In addition, an individual's occupation also plays a role, with professionals often using coffee as a tool to increase productivity, in contrast to other demographic groups who may indulge in coffee for leisure or social engagement (Han et al. 2018).

Consumption patterns have revealed significant differences in the way urban and rural populations consume the beverage. Urban dwellers often gravitate towards convenience and choose instant or takeaway coffee to suit their faster-paced lifestyles (Lo & Fryxell 2005). This trend is reflected in their higher consumption of disposable plastic cups, as confirmed by research from Smith (2018). Although rural consumers are not immune to the convenience of instant coffee, they generally maintain traditional coffee practices and prefer home-brewed options. This reflects a broader pattern of globalization where traditional distinctions between urban and rural diets are becoming increasingly fluid. Concurrently, urban coffee culture is being enriched by speciality coffee trends that emphasize the quality and origin of coffee that rural areas have traditionally celebrated (Reardon & Timmer 2007).

The adoption of urban lifestyles is often accompanied by an increase in waste production, including disposable coffee cups, which contributes to a larger ecological footprint compared to rural lifestyles. Furthermore, research from the U.S. Census Bureau (2016) indicates that differences in household income and poverty between urban and rural areas can influence the affordability and accessibility of healthier coffee options, such as coffee from organic or sustainable sources (Mendez et al. 2010).

Table 1 Factors affecting consumer attitudes towards coffee

Type	Factor	Key finding	Supporting literature
Influencing Factors	**Health beliefs**	Coffee is appreciated for its perceived benefits like increased energy and alertness. Excessive consumption may lead to anxiety, sleeplessness, and other health concerns.	(Samoggia et al. 2019; Lee et al. 2015)
	Environmental aspects & sustainability	Consumers are increasingly selecting coffee options that promote sustainable practices.	(Lee et al. 2015)
	Motives	Such as habit, social, taste, mood, and pleasure play significant roles in factors to drink coffee.	(Spinelli et al. 2017)
	Personal preference	Taste preferences, caffeine sensitivity, and lifestyle decisions are personal preference factors that influence coffee intake.	(Samoggia et al. 2020)
	Social & cultural aspects	Coffee drinking is often a social activity, and the beverage choice reflects this aspect. Traditional practices and regional preferences strongly influence coffee consumption habits.	(Samoggia et al. 2018; Lee et al. 2015)
	Buying trends & innovations	The growing popularity of speciality coffees reflects a shift towards quality. There is a trend towards home brewing and using speciality coffee-making equipment.	(Euromonitor International 2021; World Coffee Portal 2021)
Buying Behaviour	**Marketing strategies**	Coffee marketing promotes consumption by sending targeted messages that appeal to health, convenience, emotions, and various preferences across populations. As well as branded efforts assistance from influencers, interesting content, and immersive events all influence how customers view and approach their coffee choices.	(Samoggia et al. 2020)
	Price	Consumers are willing to pay for a speciality coffee or coffee with sustainable labels. Also, the perceived quality, unique characteristics, cost in comparison to opponents, and other benefits that buyers obtain for their money all have an impact on its value.	(Sepúlveda et al. 2016; Lee et al. 2015)
	Brand	Brand reputation and loyalty influence consumer choices in the coffee market.	(Sepúlveda et al. 2016)

	Place & accessibility	The rise in home coffee brewing indicates a trend towards more personal coffee experiences. Also, the experience offered by coffee shops plays a significant role in consumer preferences.	(Schneider et al. 2020)
Quality parameters	**Freshness**	Freshly roasted coffee beans are preferred for their flavour quality.	(Spence & Carvalho 2020)
	Health aspects	It claims both health benefits and health risks, which influence consumer perceptions toward coffee.	(Samoggia & Riedel 2019)
	Preparation	Varieties in the coffee bean, roast level, grind size, brewing temperature, brewing duration, preparation techniques, and coffee varietals all have an impact on the flavour profiles, strength, and general preferences of the consumer.	(Caprioli et al. 2015)
	Sensory (taste, acidity)	The flavour profile of coffee is a primary factor affecting consumer preference.	(Samoggia et al. 2020)
	Smell	Numerous studies have been conducted on the aroma of coffee, and the results indicate that the aroma is very important in determining how customers perceive and enjoy the beverage.	(Labbe et al. 2015)
	Texture	Coffee mouthfeel is heavily impacted by characteristics such as the brewing process and bean quality, which have a substantial impact on consumer preferences.	(Labbe et al. 2015)
	Age	Younger demographics show a preference for specialized coffee drinks, while older individuals often opt for traditional methods.	(Lee et al. 2020; Aguirre 2018)
	Gender	Coffee consumption tendencies vary by gender, with men often consuming larger amounts and favouring stronger brews, while women prefer lighter roasts and are more impacted by social elements. However, other studies did not find any correlation.	(Giacalone et al. 2019; Aguirre 2016)
	Cultural background	Cultural norms and traditions shape coffee preferences, with specific practices and regional tastes influencing choice and consumption.	(Chang et al. 2020; Shin et al. 2020)
	Education level	Those with higher education levels often have increased awareness of coffee's origins and are more considerate of ethical and sustainable practices in their coffee choices.	(Shin et al. 2020)

Socio-economics factors	**Household size**	Increasing coffee consumption in larger homes may lead to a preference for convenient brewing techniques or purchasing in large quantities.	(Koman et al. 2019)
	Income level	A higher income level is associated with a willingness to invest in premium coffee products, with consumers valuing quality and brand reputation.	(Laurico et al. 2021)
	Nationality	Coffee preferences vary by nationality, with different cultural groups having distinct favoured flavours, brewing techniques, and rituals.	(Huse et al. 2023)
	Occupation	Occupation affects coffee consumption; professionals often use coffee for productivity, while other occupations may have varying coffee-drinking patterns.	(Laurico et al. 2021)
	Urbanisation	Urban residents are more likely to frequent speciality cafes and exhibit a preference for gourmet and artisanal coffee experiences.	(Clark & Wu 2021)

2.2.   Benefits of drinking coffee

Coffee offers various health benefits attributed to its bioactive components, including caffeine, cafestol, kahweol, chlorogenic acid, and essential micronutrients such as magnesium, niacin, and vitamin E. These constituents contribute to its reported advantages, including its antioxidant properties, antibacterial effects, and potential to mitigate chronic diseases such as obesity, diabetes, and neurodegenerative conditions. Moreover, coffee has garnered increasing attention in recent research due to its possible health benefits. The consumption of coffee has also been associated with a reduced risk of various diseases, including cancer, obesity, cardiovascular illnesses, and neurodegenerative disorders. In summary, coffee's health advantages are linked to its rich blend of bioactive compounds, contributing to its antioxidant, antibacterial, anti-obesity, anti-diabetic, and anti-inflammatory properties, and its potential role in reducing the risk of various chronic diseases (Chang et al. 2020; Gökcen et al. 2019; Pan et al. 2016; Schmit et al. 2016; Bharath et al. 2015; Messina et al. 2015; Higdon & Frei 2006). Recent research on the benefits of drinking coffee is provided in Table 2.

The International Agency for Research on Cancer (IARC 2016) classified it as a non-carcinogenic chemical for humans. Its use and the associated cancer risks have been well examined. Many studies on the anticancer properties of coffee have identified kahweol as one of the key compounds implicated in cancer chemoprevention. Kahweol is an antioxidant that protects DNA against oxidative damage. Polyphenols in coffee, such as chlorogenic acid, have antioxidant and anti-inflammatory properties in addition to kahweol. It inhibits cancer by eliminating pro-carcinogens, reducing oxidative damage, and activating cellular defence in the initiation phase of carcinogenesis, removing injured cells, and exerting an anti-inflammatory impact in the progressive stage of carcinogenesis (Gökcen et al. 2019; Park et al. 2016; Hashibe et al. 2015; Bøhn et al. 2014; Cárdenas et al. 2014; Fukushima et al. 2014).

Coffee prevents cancer by removing pro-carcinogens, inhibiting oxidative damage, stimulating cellular defence in the early stages of carcinogenesis, removing damaged cells, and exerting an anti-inflammatory effect in the progressive stages of carcinogenesis (Bøhn et al. 2014).

There is a statistically significant linear association between the amount of coffee consumed and the relative risk, and several case-control studies on coffee and the risk of

endometrial cancer conducted in Italy and Japan have produced data indicating a 50–60% lower risk for coffee consumption of three or more cups per day. Comparable findings were reported in a Japanese population-based cohort study, which showed that daily coffee consumption of at least three cups was associated with a 60% decreased risk compared to daily consumption of less than two cups (Gökcen et al. 2019).

Coffee and its primary bioactive constituent, caffeine, have been associated with protective effects against neurological disorders such as Parkinson's and Alzheimer's disease. Studies recommend a similar consumption level, as mentioned about cancer prevention, to also protect against these neurological conditions (Yamada-Fowler & Söderkvist 2015).

Caffeine, in particular, is believed to play a crucial role in reducing the risk of Parkinson's and Alzheimer's by exerting a neuroprotective effect that may slow the progression of these diseases. Researchers discovered that those who frequently drink coffee have a 31% reduced chance of Parkinson's disease compared to people who do not drink coffee, in addition to also having a lower risk of Alzheimer's disease (Rodak et al. 2021; Butt & Sultan 2011).

Coffee drinking is linked to a lower risk of type 2 diabetes and improved glucose tolerance. More than 20 prospective cohort studies undertaken in the United States, Asia, and Europe have found a link between type 2 diabetes and coffee intake. According to Yarmolinsky et al. (2015), coffee may reduce the risk of diabetes in adults. There is growing evidence that drinking 3 to 4 cups of coffee each day reduces the risk (Alperet et al. 2016; Yarmolinsky et al. 2015).

Regular ingestion of chlorogenic acid, the major coffee polyphenol, decreases body fat, particularly abdominal fat, including visceral fat. While caffeine inhibits fat absorption, chlorogenic acid lowers triglyceride levels in the liver. Lee et al. (2015) found that chlorogenic acid and caffeic acid have anti-obesity actions in the liver by lowering cholesterol and fatty acid oxidation. Lee et al. (2013) discovered in another study that moderate coffee consumption effectively lowered energy intake throughout the day and after meals. The green coffee extract has been found to have an anti-obesity effect, resulting in weight loss by modulating adipogenesis and genes and proteins linked with lipid and liver metabolism (Gökcen et al. 2019; Cho et al. 2018; Lee et al. 2015; Lee et al. 2013; Onakpoya et al. 2011).

More recently, caffeine has been shown to possess positive effects on long-term retention by enhancing memory consolidation. While some research demonstrates that caffeine improves short-term memory, others show that caffeine has little effect on memorizing performance or rather worsens short-term memory. However, other studies have found that drinking coffee improves memory over the next 24 hours (Ludwig et al. 2014).

Caffeine has also been proven to boost performance on tasks that rely on working memory. Several research including both humans and animals have shown that caffeine consumption influences cognitive function. Angelucci et al. (2002) for example, used the Morris water maze task to examine the effects of coffee on memory in rats. Caffeine was given to the rats in this study either immediately after training, 30 minutes before training, or 30 minutes before the maze test. The study concluded that caffeine ingestion improves memory retention in rats. Rats given caffeinated coffee showed much faster reaction times than rats given decaffeinated coffee. According to this study, a low amount of coffee (65 mg) reduced simple reaction time and enhanced the encoding of new information (Angelucci et al. 2002).

Current research, however, indicates that when caffeine does alter mood, the most substantial changes are seen in anxiety. Caffeine does not appear to have a substantial influence on attention, but it does appear to play a role in enhancing processing speed, according to studies. The majority of the studies looked at the effects of caffeine on memory. Caffeine appears to improve both short- and long-term memory in adults and older populations (Fiani et al. 2021; Smith 2013; Angelucci et al. 2002).

Table 2 Recent research on the benefits of drinking coffee

Type of health benefit	Key findings	Supported reference
Anti-obesity	Coffee's capacity to regulate body fat storage has stimulated research into its potential methods, which include inhibiting adipocyte growth, modulating transcription factors and proteins involved in fat production, and altering gut microbiota makeup. These multiple procedures show potential for tackling obesity concerns. However, Sarriá et al. (2018) discovered a twist: despite the favourable benefits of both green and roasted coffee on metabolic markers, they did not result in substantial reductions in patients' body weight.	(Tajik et al. 2017; Pan et al. 2016; Ludwig et al. 2014; Mejia et al. 2014)
Alzheimer's and Parkinson's	In terms of cognitive health, coffee appears to be an effective ally against neurodegenerative disorders such as Alzheimer's and Parkinson's. Coffee drinking reduces the risk of Alzheimer's disease by 65 % in persons aged 65+. Furthermore, each additional cup of coffee is associated with a 7% reduction in Parkinson's risk. Notably, three cups per day provide the best advantages for Parkinson's patients, demonstrating caffeine's neuroprotective potential in delaying disease development.	(Mejia et al. 2014; Cano-Marquina et al. 2013)
Booster for energy	Coffee, with its high caffeine concentration, acts as a central nervous system stimulant by blocking adenosine, boosting energy levels, alertness, attention, and athletic performance in the short term, while also improving mood, cognitive function, and stress response, stimulating the brain.	(Ruxton 2008)
Cancer	In 2016, the International Agency for Research on Cancer (IARC) reviewed more than 1,000 articles on coffee and cancer. While no direct correlation was discovered, strong coffee consumers had a lower cancer risk, with a 26% drop in colorectal cancer, particularly distal colon cancer. This shows coffee's ability to prevent colorectal cancer.	(Poole et al. 2017; Loomis et al. 2016)
Central Nervous System	The benefits of regular and moderate coffee drinking are on the neurological, digestive, and cardiovascular systems, as well as kidney function.	(Surma et al. 2021; Ludwig et al. 2014)
Long term memory	Caffeine has stimulatory effects on the central nervous system as well as a favourable influence on long-term memory.	(Ludwig et al. 2014)
Mortality	Coffee drinking was connected with a lower risk of death overall in Asian populations, as well as a lower risk of death from cardiovascular disease and cancer.	(Shin et al. 2022; Laurico et al. 2021)

Stroke	The relative risk of stroke was shown to be 5% lower for a median daily consumption of 5 cups and 15% lower for 3.5 cups in comparison with a median intake of zero cups, according to a comprehensive meta-analysis of 36 cohort investigations into cardiovascular illnesses, including stroke. A Korean study found that women have greater impacts than men, which can be attributed to specific hormones (estradiol) that reduce caffeine absorption in women.	(Park et al. 2020)
Type-2 Diabetes	Coffee polyphenols help to enhance glucose and insulin metabolism, which reduces the risk of developing type 2 diabetes. This protective effect is particularly prominent in women. Drinking three to four cups of coffee each day lowers the risk by 25% compared to minimal caffeine use. Furthermore, each additional cup consumed per day is associated with a 6% reduction in the risk of developing type 2 diabetes.	(Freeman et al. 2018; Grosso et al. 2017; Ding et al. 2014)

2.3.   Challenges in drinking coffee

When considering the health effects of coffee consumption, a comprehensive assessment of the physiological and psychological effects of caffeine reveals both the potential for adverse effects and the extent of individual differences. Regular use of caffeine can lead to tolerance and dependence, while high levels of consumption (1000-1500 mg per dose) can cause anxiety, tremors and sleep disturbances. The average caffeine intake per person per day varies widely between countries, ranging from 210 mg in the US and Canada to 400 mg in Sweden and Finland (Santos et al. 2019; O'Callaghan et al. 2018).

Although the acute cardiovascular effects of caffeine, such as increases in heart rate and blood pressure, are temporary in habitual coffee drinkers, they can be significant in infrequent consumers. These effects result from caffeine's interaction with adenosine receptors, which vary widely between individuals due to genetic factors (Fiani et al. 2021; Smith 2013; Angelucci 2002). In terms of bone health, caffeine can inhibit calcium absorption, which can affect bone mineral density and increase the risk of fractures, particularly in older adults. However, adequate calcium and vitamin D intake may counteract this potential risk (Higdon et al. 2006).

In addition, caffeine can cause restlessness and anxiety, and overdose can cause headaches and nervousness. Withdrawal symptoms following cessation of regular consumption include headaches and cognitive impairment, reflecting the profound effects of caffeine on human health (O'Callaghan et al. 2018; Smith 2013). Furthermore, the antioxidant capacity of coffee is influenced by the degree of roasting, with medium-roasted coffee having the highest antioxidant activity (Rodak et al. 2021; Bae et al. 2014).

Table 3 Recent research on challenges of drinking coffee

Type of health challenges	Key findings	Supported reference
Addiction and Tolerance	Caffeine consumption regularly might lead to tolerance, which means that greater amounts are required to produce the same results over time. This can lead to increasing reliance and difficulty in reducing or quitting caffeine usage.	(Santos et al. 2018)
Anxiety and Hypertension	The complex metabolism of caffeine, which is controlled by individual enzyme activity, is a major contributor to anxiety and hypertension. Its addictive nature also encourages chronic caffeine cravings and causes withdrawal symptoms such as headaches and irritability. Higher amounts (400-800 mg per dose) considerably worsen anxiety and insomnia, confounding the link between coffee consumption and mental health.	(Khan et al. 2021; Wasim et al. 2020; Mejia et al. 2014)
Blood pressure	Acute caffeine consumption, particularly among occasional coffee drinkers, can temporarily elevate blood pressure. Furthermore, heavy or prolonged coffee drinking may raise the risk of hypertension in some people. This highlights the significance of coffee's effect on blood pressure and the potential risk of arterial hypertension, creating an ongoing discussion about its safety for hypertensive people.	(Surma et al. 2021; Tajik et al. 2017; Mejia et al. 2014)
Bone fracture	There is a negative correlation between coffee drinking and bone fractures in women; high coffee users had a 14% higher risk of bone fractures than low coffee drinkers. This risk is most likely associated with the way that coffee affects the density of bone minerals and the absorption of calcium. Nevertheless, Wikoff et al.'s systematic study found that a 400 mg daily dose of coffee had no negative effects on calcium metabolism, density of bone minerals, or fractures.	(Poole et al. 2017; Wikoff et al. 2017; Lee et al. 2014; Heaney 2002)
Dehydration	Dehydration can result from the diuretic effects of caffeine, which increase urine production and can lead to fluid loss, especially with excessive intake. Anxiety and nervousness are common side effects of high doses of caffeine.	(Grandjean et al. 2000)
Headache and Diarrhoea	Headache, diarrhoea and complications in higher doses for a person with a sensitive stomach are causing harm regarding drinking coffee. Since coffee contains the chemical element caffeine, consuming too much of it might produce headaches.	(Tajik et al. 2017; Mejia et al. 2014; Bigal et al. 2002)

Increased cholesterol levels	Coffee contains chemicals including kafestol and kahweol, which can elevate cholesterol levels, particularly in unfiltered or brewed coffee. High cholesterol increases the risk of heart disease.	(Chang et al. 2020)
Sleeplessness and Restlessness	High caffeine intake, often from coffee, can cause sleep disturbances like insomnia and restlessness. The recommended daily limit is 400 milligrams, equivalent to about 4 cups of coffee. Chronic caffeine consumption may disrupt sleep patterns and diminish pineal gland function, impacting sleep quality later in life. Therefore, individuals experiencing sleep issues should avoid evening coffee consumption.	(Wasim et al. 2020; Wachamo 2017; Bell et al. 2011; George et al. 2008)

2.4. Obesity-related to Cofee Consumption

Obesity and overweight are described by the World Health Organization (WHO) as "abnormal or excessive fat accumulation that poses a health risk." A body mass index (BMI) of 25 or higher is considered overweight, and a BMI of 30 or more is considered obese. The Body Mass Index (BMI) is a frequently used statistic for categorizing people into different groups based on their body composition and relative health risks. These groups, defined by specific BMI ranges, provide a framework for comprehending and resolving a variety of health issues. BMI is classified into four categories: underweight (BMI < 18.5), normal weight (BMI 18.5-24.9), overweight (BMI 25-29.9), and obese (BMI ≥ 30). Each classification represents a different level of adiposity, with underweight people at risk of malnutrition, whereas overweight and obese people are more likely to develop chronic conditions like cardiovascular disease, diabetes, and some cancers. (WHO 2024; Barros et al. 2022).

It is a continuing global health crisis, with prevalence rising rapidly, particularly in low- and middle-income countries. According to a recent World Obesity Federation (WOF) projection, approximately one billion people will be obese worldwide by 2030, including one in every five women and one in every seven men. Between 2010 and 2030, it is expected that the prevalence of obesity will double across South and Southeast Asia. By the same year, 45 million South and Southeast Asian children over the age of five may be affected by childhood obesity, which is rising sharply in the region along with adult rates (Tham et al. 2023).

An estimated 27 million Filipinos are fat, with 3.6 million being young people in their twenties. These figures come from the Department of Science and Technology's Food and Nutrition Research Institute (DOST-FNRI). Consumption of "highly processed food" as well as sweetened beverages, as well as a lack of physical activity, are the root causes. According to World Obesity, the national risk of obesity for Filipinos is 6 out of 10, where women are more prone to obesity than men (Torres-Ticzon et al. 2020).

This is related to the fact that the number of fast-food chains in the Philippines has increased dramatically in recent years. These restaurants provide convenience, but the food they serve is heavy in sugar, salt, and harmful fats. Fast-food restaurants appear to be able to meet the public's increasing need for affordable, easily available nourishment. The majority of Filipinos eat fast food at least three times a week, according to a survey

by the Food and Nutrition Research Institute (FNRI), which contributes to excessive calorie intake and nutritional imbalances. The Philippine fast-food market saw a significant 28.23% shift in transactions in 2012. (Ilic 2024; Ramos & Bulusan et al. 2019; UNICEF 2019).

Fast food chains including Jollibee, McDonald's, Mang Inasal, Chowking, KFC and Greenwich are major players in the market, where Jollibee is actually the biggest fast-food company in the Philippines and routinely outperforms its rivals. One thousand of Jollibee Food Corporation's out of the total of 3,555 locations worldwide were located in the Philippines as of May 2017, demonstrating the nation's competitive fast-food market. The widespread intake of sugary beverages, such as sodas and sweetened iced coffee, has also been connected to obesity. These drinks exacerbate diabetes, obesity, and other metabolic diseases. Because fast food restaurants are so prevalent in the Philippines, they are often the first choice for many Filipinos when it comes to eating out (Wu et al. 2021; Ramos & Bulusan et al. 2019).

The rise in popularity of processed foods like candies, chips, and instant noodles, as well as all-you-can-eat, low-cost sweets and excessively sweetened drinks, is another factor that leads to obesity. These foods are loaded with chemical additives and preservatives, and they frequently lack important nutrients (Ramos & Bulusan et al. 2019).

The government of the Philippines suggested taxing sugar-sweetened beverages, including sweetened coffees, in 2018 in response to the country's rising obesity rates. The study's findings, however, indicate that the overall advantages will not be as great as planned. They further claim that it will result in lobbying. Generally, it is anticipated to have positive impacts on public health after all (Huse 2023).

2.4.1. Preferences for Instant Coffee among Filipinos: Exploring Convenience, Affordability, and Cultural Factors

The popularity of instant coffee among Filipinos is rooted in a combination of factors that make it a preferred choice over freshly brewed coffee. This preference is driven by convenience, affordability, and cultural influences. While the Philippines does cultivate high-quality coffee beans, the ease of access, simplicity in preparation, and cultural significance of instant coffee contribute to its prominence in the Filipino coffee

consumption landscape. The Philippines is one of the major players in the instant coffee business (Mina & Campos 2021).

Convenience emerges as a key factor motivating the inclination towards instant coffee. The rapid pace of modern life and the need for on-the-go solutions align with the ease of preparation that instant coffee offers. The straightforward process of dissolving a pre-packaged sachet of instant coffee in hot water contrasts with the labour-intensive nature of preparing coffee beans, which necessitates sun-drying and grinding before consumption (Mina & Campos 2021).

Affordability also plays a significant role in the prevalence of instant coffee consumption among Filipinos. The cost-effectiveness of instant coffee compared to freshly brewed alternatives makes it an accessible option for a broader demographic. This economic advantage further reinforces its popularity, particularly in areas where freshly brewed coffee might be relatively more expensive or less accessible due to geographical constraints (Laurico et al.2021).

Cultural considerations contribute to the preference for instant coffee as well. Embedded within Filipino culture, the consumption of instant coffee has become emblematic of daily routines, often serving as a staple choice for breakfast or a mid-day pick-me-up. The prevalence of small local stores, known as "sari-sari stores," selling instant coffee sachets attests to its cultural integration and availability within communities. This cultural context fosters a sense of familiarity and comfort associated with instant coffee consumption. While instant coffee provides a convenient and affordable option for Filipinos, it is important to acknowledge that not all individuals favour this choice. Many Filipinos still hold an appreciation for the traditional process of freshly brewed coffee, recognizing the labour and time invested in its preparation (Laurico et al. 2021).

2.5.   Environmental Concerns Related to Coffee Consumption

Worldwide situation

Regulatory initiatives for plastic waste management have been developed in a number of countries, each with its own strategy for limiting environmental harm. Bangladesh stands out in this area, having banned thinner plastic bags as early as 2002. Morocco followed suit in 2016, though with a minor time lapse. Meanwhile, Australia became a pathfinder in 2011 when it passed legislation prohibiting the circulation of single-use, lightweight plastic bags, albeit only in retail establishments (Kibria et al. 2023).

Within the Philippine context, common plastic usage trends highlight the importance of addressing plastic waste management methods. Notably, the most common plastic products include straws (66%), labo bags (65%), polystyrene food containers (64%), juice packs (59%), drinking cups (56%), plastic cutlery such as spoons and forks (54%), and plastic bottles (41%) (Plastic 2024).

Against this context, public perception and consumer behaviour regarding plastic use have shifted significantly. A nationwide study done by Social Weather Stations in partnership with the Global Alliance for Incinerator Alternatives (GAIA) indicated that 40% of respondents support corporations' development of plastic alternatives. Furthermore, 60% of consumers prefer to buy food condiments in reusable or recyclable packaging rather than plastic bags. These findings highlight the Philippine population's increased awareness and openness to sustainable packaging options, indicating a developing paradigm of environmental stewardship and responsible consumption practices (Plastic 2024).

Situation in the Philippines

Marine plastic pollution (MPP) is a continuous and universal issue with significant worldwide and national consequences due to the interconnection of the oceans. Plastics that have been improperly disposed of leach into coastline and aquatic ecosystems, making recovery difficult. They therefore present environmental and health risks to people in general, creatures, as well as to ecosystems (Alindayu et al. 2023; (Bamunuarachchige & De Zoysa 2022; Alejos et al. 2021).

A plastics regulatory strategy has to be developed and enforced because the Philippines is one of the biggest pollutants of plastics, both macroplastics and microplastics, in the marine coastal environment. One of the nations in the Western Pacific with the highest concentration of plastic waste in the marine coastal environment has long been mentioned: the Philippines. Population expansion, the anticipated usage of plastics, and their improper disposal have all been blamed for this. One of the main causes of uncontrolled plastic waste disposal is thought to be bag management in both marine and terrestrial coastal environments. Nonetheless, it is indisputable from a scientific standpoint whether this is the primary cause of designating the Philippines as a plastic polluter of the marine ecosystem. Research on macro plastics along specific Philippine coasts has revealed that the most common waste are plastic bags, cups, and packaging (Galarpe et al. 2023; Ritchie 2022; Esquinas et al. 2020; Kalnasa et al. 2019; Lebreton et al. 2019; Paler et al. 2019; Jambeck et al. 2015).

At the regional level, there are a number of plans of action that target particular areas. At the regional level, many strategies have been created with a specific topic in mind. With the implementation of the Marine Strategy Framework Directive, or MSFD, Europe was among the first to enact regulations intended to reduce marine litter and microplastics. Asia quickly adopted this strategy, with separate marine litter action plans for the Northwest Pacific, South Asian, as well as for the East Asian Seas (Hermawan & Astuti 2021; Otero et al. 2021),

The Department of Environment and Natural Resources (DENR) of the Philippine government created a National Action Plan for the Prevention, Reduction, and Management of Marine Debris in 2021 as a solution to this situation. This document outlines the nation's strategies, which are mostly focused on lowering plastic and other forms of marine pollution. The primary objective is to attain "zero waste in Philippine waters by 2040" and to realize the Philippine vision of "zero marine litter" through collaborative efforts (Alindayu et al. 2023; Bueta et al. 2023).

Environmental issues have become a never-ending research topic, yet there are a number of countries in Europe and around the world that are putting an emphasis on green laws. In 2020, the local government area of Odiongan in Romblon imposed a "no single-use plastic" legislation in all establishments, including restaurants, as part of a sustainable

waste management strategy that has been implemented throughout the Philippines (Vicente et al. 2023).

Obtaining support and correct information on single-use plastics is one of the problems dining establishments encounter. Searching for providers of single-use plastic replacements proved to be difficult for the participants. Restaurants have found it difficult to switch to paper products because of complaints from clients, impracticability, and increased expenses that eventually reduce sales (Vicente et al. 2023).

Disposable cups

The expansion of coffee shops around the world has resulted in a significant increase in coffee consumption, both at these facilities and at home. According to research forecasts, the market for disposable paper cups suited for hot coffee consumption will grow significantly, reaching 294 billion units by 2025. This projection assumes a compound annual growth rate (CAGR) of 1.8% from an expected 118 billion units per year in 2018. Notably, there has been a noticeable increase in demand for disposable coffee cups, with a 16% increase documented between 2012 and 2017, indicating an ongoing trend set for long-term expansion (Espin et al. 2018).

The increase in demand can be linked, in part, to changing consumer lifestyles marked by greater demands for convenience and mobility, which are exacerbated by rising disposable income levels. As a result, the number of customers using disposable out-of-home (OOH) cups has increased proportionally. Concurrently, consumer concern about the environmental consequences of their product choices has risen to the forefront of public debate, particularly among the millennial and Generation Z cohorts. These generational cohorts, noted for their inclination toward sustainability and eco-conscious consumer patterns, have a significant impact on market dynamics and driving demand for environmentally responsible alternatives (Dybka-Stępień et al. 2021).

3.   Aims of the Thesis

The major goal of this thesis was to fill a significant gap in the existing literature, in which various arguments about coffee consumption, obesity, and environmental concerns were widely dispersed. Despite the amount of scholarly discourse, which includes according to Web of Science around 17,685 papers on coffee, 124,852 articles on environmental issues, and 95,301 articles on obesity, there is a noticeable lack of integration of these topics in the context of the Philippines. Notably, just 31 papers in the Philippine context focus on obesity, 22 on coffee, and 40 on environmental concerns, but none of them analyse the links between these key topics in depth (Web of Science 2024).

Against this backdrop, the primary goal of this thesis was to fill a scholarly gap by presenting a fresh perspective on the complex interplay between coffee consumption, obesity, and environmental sustainability. The resulting synthesis of these distinct but interconnected issues promises to provide significant insights into the many problems and opportunities associated with creating a more holistic and sustainable approach to consumption patterns and lifestyle choices.

Furthermore, this study aimed to identify and analyse the specific challenges and issues related to environmental awareness and healthy lifestyles of both students and staff on the campus of the Visayas State University, Leyte Island, the Philippines. Through in-depth investigation, the findings from this research highlighted the main reason why respondents drink or do not drink coffee, as well as their perceptions of coffee in terms of benefits versus harm, their impacts, and their perceptions of recycling and plastic disposable cups.

Key research questions were developed to guide inquiry and discovery within this thematic framework:

- What motivates coffee consumption and abstinence in the differences from the perspective of gender and residential area of the young generation?
- How do consumers perceive coffee-related health concerns?
- Do discounts influence reusable cup usage at coffee shops?
- Is obesity correlated with coffee sweetening?

4.   Methodology

4.1.   Survey design

This thesis used exploratory research as the main methodological approach. Its conceptualisation was based on previous research on coffee, the environment, the health effects of coffee drinking and obesity. The reason for choosing survey research was its usefulness in capturing different perspectives and tendencies of consumer behaviour.

The inclination towards younger demographic groups, specifically millennials and Generation Z, is supported by their receptiveness to embracing change, especially in the field of education. Existing literature suggests that this cohort exhibits increased environmental awareness and a propensity to adopt lifestyle changes that promote ecological balance (Smith et al. 2013). The research therefore focused on individuals aged 18 to 42, a group that was influential and therefore had the potential to initiate wider social change.

Given the dynamic nature of this segment of young adults, an online survey was created using Google Forms to facilitate accessibility and engagement. This method was adapted to capture the views of Filipinos living in the country, which is in line with the study's focus on domestic consumption patterns. To capture the full spectrum of coffee-related behaviours, the survey distinguished between coffee drinkers and abstainers.

This distinction is intended to reveal the underlying motivations and demotivations that influence coffee consumption. A comprehensive review of the existing literature informed the survey, which examined three main aspects: factors influencing coffee consumption, the environmental impact of coffee production, and the relationship between diet and health. These dimensions collectively form a comprehensive framework for understanding the complexities of coffee consumption within the Visayas State University campus.

The influencing elements for this study were carefully chosen, spanning a wide range of determinants such as health beliefs, marketing methods, motivations, personal preferences, price concerns, and established conventional practices. Among these, factors connected with coffee quality were given top priority, particularly freshness, health benefits, and rigorous preparation procedures. However, sensory qualities such as taste,

acidity, mouthfeel, aroma, and texture developed as essential principles of the quality paradigm, emphasizing their importance in determining customer perceptions and preferences.

The combination of these elements resulted in the identification of quality characteristics important for understanding and affecting coffee consumption trends. Socioeconomic parameters were also carefully included to provide a comprehensive picture of the socio-cultural context influencing coffee consumption. These included demographic characteristics such as age, gender, education level, and geographical context of residency, which served as critical lenses for exploring nuanced differences in consumer behaviour and preferences across distinct demographic cohorts.

The investigation identified the key reasons people drink coffee as being largely based on its taste and smell, which are the main drivers for consumers. Conversely, some avoid coffee due to its flavour, scent, and how acidic it can be. A thorough analysis was carried out to understand how well consumers recognised the health implications of their coffee habits, their preferences for adding sweeteners, and the popular types of coffee they choose.

Furthermore, the study examined regions with high coffee consumption to gain insight into the concerns of consumers regarding their health and the environmental impact of plastic. It also explored the preferences of consumers regarding cups or containers for their coffee. The primary objective of the research was to identify the factors that influence the willingness to reduce plastic, bring disposable cups and reduce sugar. Moreover, the impact on the environment, sustainability and health was investigated (Figure 1).
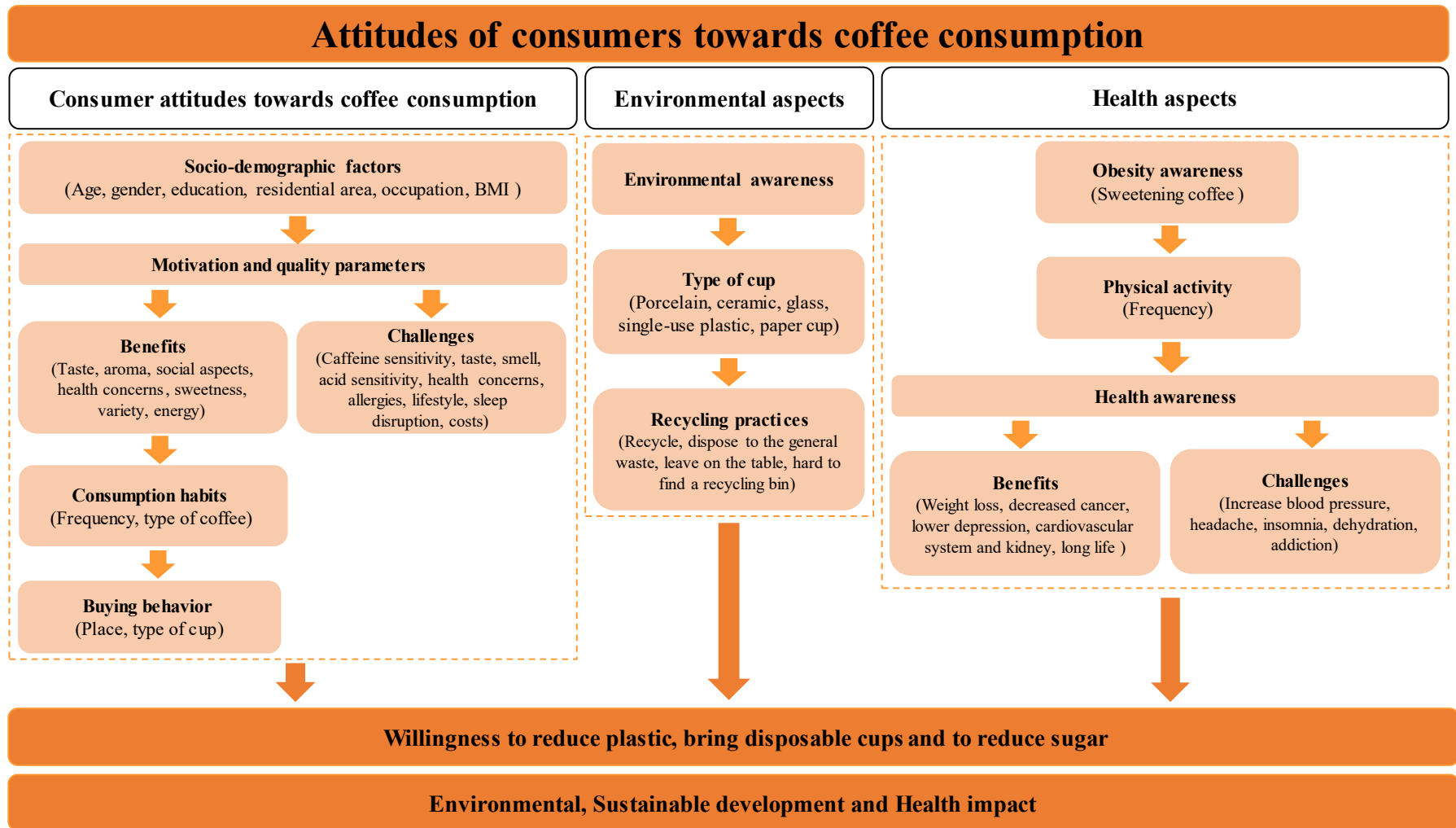
Figure 1 Conceptual design of consumer attitudes towards coffee consumption

4.2.   Data collection instrument

Quantitative data were collected through a questionnaire-based consumer survey among young respondents. The survey structure began with a brief introduction that outlined the research project's key aims (Annex 1). This preface was followed by an explanation of the academic institutions' collaboration, which suggested a cooperative effort in scientific study. In addition, respondents were given an expected timeline for completing the survey, which increased openness and moderated expectations about the time commitment required. The survey was carefully designed to allow for a systematic examination of all aspects of coffee-drinking behaviour and related factors. It was separated into three distinct sections. Each part was carefully constructed to uncover key components of coffee consumption dynamics, resulting in a thorough examination of customers' preferences and motives for coffee drinking.

The first section of the survey began with a broad and comprehensive question about general coffee consumption habits, allowing all respondents to participate regardless of their coffee consumption status. Non-coffee drinkers were then directed to skip the second part and move on to the survey's conclusion.

The second component of the poll used a more targeted approach, focusing on students' reasons for drinking coffee or abstaining from it. A detailed survey of favourite coffee varieties and related practices, such as added sugar and preferred drinking venues, was done. Respondents were also asked to reflect on their participation in physical exercise, putting coffee intake behaviour in the perspective of larger lifestyle concerns.

The survey's final section aimed to identify socioeconomic characteristics that influence coffee consumption trends. A thorough assessment of demographic characteristics such as gender, age, education level, and geographical location was conducted to identify potential associations with coffee-drinking preferences and behaviours. Furthermore, respondents were able to offer anthropometric data such as height and weight, allowing for a more in-depth investigation of the relationship between individual attributes and coffee consumption trends.

The survey was strategically divided into these different thematic sections, each of which was carefully designed to explore relevant aspects of coffee consumption behaviour and socioeconomic factors, to provide an in-depth comprehension of the

multifaceted dynamics underlying consumer preferences and motivations in coffee consumption.

The survey methodology was mostly organized, with a focus on closed-ended questions. Within this framework, a significant number of questions were written as Likert scale items, which were intended to assess respondents' opinions and views along a continuum of responses ranging from "1 = strongly disagree" to "5 = strongly agree". This format enhanced the quantification of subjective opinions and allowed for a deeper comprehension of respondents' perspectives on various aspects of coffee-drinking behaviours and related problems.

Furthermore, numerous questions were particularly designed to assess respondents' level of concern, using a graduated scale ranging from "1 = not concerned at all" to " 5 = extremely concerned". This scale, which represents a range of apprehension levels, provides insights into the relative importance of several aspects of coffee intake and related issues. In addition to Likert scales and concern-based assessments, a supplemental scale with categorical responses ranging from "always" to "never" was used. This scale, which was divided into defined categories, helped to clarify the frequency of various behaviours or practices linked with coffee intake, expanding the depth of insights gained from survey responses. Notably, binary yes-or-no questions were used to obtain brief responses about certain characteristics of coffee consumption habits or preferences.

Moreover, a subset of questions was purposefully designed as open-ended questions, allowing respondents to express their reasons, rationales, and experiences with coffee use in their own words. These open-ended prompts, such as inquiries about the participant's drives to drink or avoid coffee, as well as questions about individual traits such as weight or height, gave valuable qualitative insights to supplement the quantitative data received through arranged response designs.

The survey methodology used a multifaceted approach to capture the depth and range of respondents' perceptions and behaviours related to coffee consumption, and included a variety of question types such as closed Likert scales, concern-based ratings, binary yes/no questions and open-ended questions. This methodological diversity allowed for the understanding of many factors that influence coffee consumption patterns and related concerns, enhancing the comprehensiveness of the research findings.

4.3. Data collection

The study was conducted via an online survey administered in the Philippines, specifically on the island of Leyte at Visayas State University (VSU), from August 4th to October 30th, 2023. The study addressed an audience of 301 respondents, the majority of whom were university students and employees with a maximum age of 42 years old. Data collection was guided by a thorough examination of relevant literature, with a specific emphasis on studying the link between coffee consumption, sweetening techniques, plastic cup usage, and obesity among Filipino people from the VSU.

Given their increased climate awareness and willingness to reduce sugary beverage consumption, the study took a targeted approach with young students, notably millennials and Generation Z. Survey questions were designed to engage coffee users by investigating their awareness of coffee's health effects, motivating factors, environmental concerns regarding cup disposal behaviours, and respondents' body mass index (BMI). Furthermore, sociodemographic questions such as gender, age, educational achievement, and residence location were included to contextualize demographic profiles within the study framework.

A non-random convenience sampling method was used, with respondents urged to use the snowball technique to spread survey participation among their peers. Notably, the use of volunteer sampling may bring biases to the study's results. To ensure questionnaire comprehensibility and validity, the survey instrument was created in English and pre-tested at Visayas State University with comments from a selected group of volunteers. Iterative modifications were performed based on their suggestions to improve clarity and relevancy.

The Visayas State University, with a student population of over 8,000 across numerous academic units and campuses, was the principal site for survey distribution. The questionnaire link was distributed via university-affiliated Facebook groups, as well as printed fliers with a QR code that led directly to the poll. The latter option, which involved distributing over 80 fliers over the university campus, proved to be especially effective in inducing survey participation, outperforming digital methods of distribution alone.

Respondents aged 42 and older were deliberately excluded from the sample. The final analysis contained a total of valid responses. This purposeful exclusion was implemented to ensure homogeneity in the study sample and to reduce potential confounding factors linked with generational differences in coffee consumption habits as well as associated concerns.

4.4.   Data analysis

The data was extracted from Google Forms using a controlled approach and then organized in Microsoft Excel. Following this preliminary stage, thorough data cleaning techniques were used to correct any errors or anomalies, ensuring the dataset's integrity and trustworthiness for future study. Basic statistical studies, including descriptive statistics, were performed in Microsoft Excel to reveal underlying patterns and trends in the dataset. Furthermore, to allow for more comprehensive analysis and inferential testing, the data was exposed to more advanced statistical techniques using SPSS Statistics, a powerful statistical software suite produced by IBM.

Descriptive statistics were mainly utilized to examine socio-economic data and identify patterns in respondents' coffee intake and lifestyle behaviours. In specifically, a Likert scale with five ordinal response categories ranging from "Strongly Agree" to "Strongly Disagree" was used to assess the importance of various aspects, respondents' readiness to recycle, and their awareness of coffee health implications. The scale's simplicity and intuitiveness made it accessible to both researchers and responders.

The averages and standard deviations were then calculated to offer quantitative summaries of respondents' views and attitudes across the Likert scale dimensions. These statistical measurements allowed for a deeper comprehension of the importance and variety of respondents' opinions, which improved the study findings' understanding and robustness. Given the 95% confidence level, a p-value of less than 0.05 indicates that the factor is statistically significant in terms of the model.

For the comparison between two groups either the gender comparison between females and males or the residential area between urban and rural the Mann-Whitney U Test was used. The reason for this test is that the deviations from the bell-shaped curve, manifested as Skewness or Kurtosis, indicated that the data did not follow a normal

distribution, violating key assumptions necessary for traditional parametric tests such as the t-test. Thus, to address this problem, the Mann-Whitney U test was chosen as a suitable non-parametric alternative for which the assumption of a normal distribution is not required, ensuring the validity of the comparative analysis between two independent groups in this study.

To analyse the differences between the four distinct BMI categories, the ANOVA test was employed. Initially, BMI was calculated using height and weight measurements and then categorised into five official groups as detailed in Chapter 2.4, Table 4. Subsequently, for the purposes of this analysis, these categories were combined into four groups: The categories of underweight, normal weight, overweight, and obesity classes 1-3 were regrouped into four groups: underweight (0), normal weight (1), overweight (2) and obesity (3). This regrouping facilitated the application of the ANOVA test, allowing for an effective comparison across the redefined BMI groups. This methodological approach provides a clear and structured analysis and takes advantage of the ability of the ANOVA test to test differences in means between multiple groups simultaneously.

The multiple regression analysis was used to reveal the relationship between various predictors (independent variables) and the motivation for coffee consumption (dependent variable). The questions were clustered together by factors as Table 4 explained.

Table 4 Clustered data set from the survey (Appendix 1) used in Table 12

Factor	Statement + [Responds]	Category	Scale + Coding
Motivation for Coffee Consumption	I like the taste of coffee I like the aroma I like sweet drinks I like the variety of coffees I need energy I appreciate the social benefits I think it has health benefits	Dependent variable	1 – strongly disagree 2 – disagree 3 – neutral 4 – agree 5 – strongly agree
Gender	What's your gender?	Independent variables	1 – females, 0 - males
Weight	What is your weight?	Independent variables	Kg
Location	Where do you live?	Independent variables	1 – urban, 2 – rural
Age groups	What is your age?	Independent variables	1– 18-23 2– 24-28 3– 29-33 4 –34-38 5– 39-42
Occupation	Are you: [Bachelor's student (undergraduate)] [Master's student (graduate)] [PhD student] [Employee of the VSU]	Independent variables	1– student = Bachelor's student, Master's student, PhD student 0 – employee
Body Mass Index	What is your weight? What is your height?	Independent variables	Used formula: kg/m²
Physical Activity	How often do you do a physical activity (e.g., exercise, active hobbies)?	Independent variables	1 – strongly disagree 2 – disagree 3 – neutral 4 – agree

			5 – strongly agree
Sensory Preferences	What is your main motivation not to drink coffee?	Independent variables	1 – strongly disagree
	[Caffeine Sensitivity]		2 – disagree
	[Taste of coffee]		3– neutral
	[Smell of coffee]		4 – agree
	[Acid Sensitivity]		5 – strongly agree
Health Concerns	How much concerned are you about:	Independent variables	1 – not concerned at all
	[Health impact of drinking coffee]		2 – slightly concerned
			3 – concerned
	What is your main motivation not to drink coffee:		4 – very concerned
	[Health Concerns]		5 – extremely concerned
	[Allergies or Intolerances]		
	How much do you agree that:		
	[Sugary coffee consumption contributes to obesity]		
	[Using less sugar in coffee can positively impact your weight and health]		
Lifestyle and Practical Considerations	What is your main motivation not to drink coffee?	Independent variables	1 – strongly disagree
	[Lifestyle behaviour]		2 – disagree
	[Sleep disruption]		3 – neutral
	[Costs]		4 – agree
			5 – strongly agree
Sweetening Coffee	Do you sweeten your coffee?	Independent variables	1 – none
	I put sugar into my cup of coffee		2 – half of teaspoon
			3 – one teaspoon
			4 – two teaspoons
			5 – three teaspoons

Environmental Consciousness and Sustainable Practices	How much concerned are you about: [Environmental impact of using plastic cups for coffee]	Independent variables	
	What type of cup do you most often use when drinking coffee? [Porcelain/ceramic/glass cup] [One-used plastic cup] [Paper cup] [My own cup, while taking coffee away]		1 – never 2 – occasionally 3 – often 4 – most of the time 5 – always
	Where do you usually throw away the one-used cup? [I recycle it in a recycling bin.] [I dispose of it in the general waste/trash bin.] [I often leave in on the table/bench/etc.] [I try to find a recycling bin, but it is not always available.] How much do you agree that: [I bring my own cup if I buy coffee to go] [I would bring my own coffee cup to go if I got a discount]		1 – strongly disagree 2 – disagree 3 – neutral 4 – agree 5 – strongly agree
Awareness of Health Implications of Black Coffee Consumption	Are you aware that drinking black coffee: [Increase metabolic rate] [Play role in weight loss] [Decrease risk of developing certain cancers] [Can lower depression] [Can have beneficial effect on cardiovascular system and on kidney functions] [Can help to live longer]	Independent variables	1 – strongly disagree 2 – disagree 3 – neutral 4 – agree 5 – strongly agree

Awareness of the Negative Effects of Black Coffee Consumption	Are you aware that drinking black coffee:	Independent variables	1 – strongly disagree
	[Increase heart rate and blood pressure]		2 – disagree
	[Can cause headache]		3 – neutral
	[Can cause insomnia]		4 – agree
	[Can cause dehydration]		5 – strongly agree
	[Can lead to addiction]		

5.   Results

5.1.   Coffee Consumption Patterns

The current study, with a sample size of 301 participants, presented an assessment of coffee-drinking practices as well as demographic and lifestyle correlations (Table 5). The majority of respondents (61.1%) classified themselves as coffee users, whereas 35.5% reported abstaining from coffee drinking. Furthermore, a complex age distribution emerged among coffee drinkers, with the 18-23 age group having the highest reflection of coffee drinking, indicating a strong preference for caffeinated beverages among younger generations. Non-coffee consumers, on the other hand, had a more homogenous age distribution, indicating that coffee abstention is less age-dependent.

In addition to age, occupational position has emerged as an important demographic predictor of coffee intake. Both coffee drinkers and non-drinkers identified primarily as students, accounting for 86.7% and 85.4% of their respective cohorts. However, employees were present among non-coffee consumers, accounting for 2.5% of the sample, indicating potential differences in lifestyle and nutritional habits across professional sectors. Furthermore, residential localization provided unique insights into the geographical distribution of coffee consumption behaviours, with urban areas marginally preferred by both coffee drinkers (40.1%) and non-drinkers (10.8%), despite a significant rural representation in both categories. Furthermore, the analysis of Body Mass Index (BMI) status revealed fascinating patterns, with a significant prevalence of individuals classified as overweight among both coffee drinkers (21.9%) and non-drinkers (14.7%).

Table 5 Socio-demographic variables, coffee consumption and non-coffee drinkers and BMI

Variable	Total N	Sample %	Coffee drinkers %	Non-coffee drinkers %
Gender				
Female	184	61.1	84.8	15.2
Male	108	35.9	90.7	9.3
I do not want to specify**	9	3	88.9	11.1
Age				
18-23	153	50.8	84.3	15.7
24-28	90	29.9	92.2	7.8
29-33	28	9.3	82.1	17.9
34-38	12	3.9	91.7	8.3
39-42	13	4.3	84.6	15.4
Occupation				
Student	261	86.7	85.4	14.6
Employee	40	13.29	97.5	2.5
Residential Area				
Urban	120	40.1	89.2	10.8
Rural	179	59.9	85.5	14.5
BMI*				
Underweight (<18.5)	34	11.3	85.3	14.7
Normal weight (18.5-24.9)	171	56.8	86.6	13.4
Overweight (25 – 29.9)	66	21.9	84.9	15.1
Obesity Class 1 (30- 34.9)	25	8.3	96	4
Obesity Class 2 (35 – 39.9)	3	1	100	0
Extreme Obesity Class 3 (40<)	2	0.7	100	0

*Source: Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion, 2022
** For further research this group was excluded.

Motivation to drink coffee targeted on gender and residential area

In this study, the technique comprised examining respondents' motivations for their coffee consumption patterns (Table 6). Respondents were given alternatives to select from, indicating their reasons for drinking coffee, such as flavour, aroma, sweetness, variety, energy, and health advantages. An online poll revealed that respondents' primary motivations for drinking coffee were the aroma (M= 4.44) and the taste (M= 4.43). These characteristics had the highest mean values overall, regardless of gender, with females being slightly more influenced by aroma (M = 4.49) than males (M = 4.38), while this difference was not statistically significant (p = 0.219). On the other side, males agreed more about the health benefits of drinking coffee but were less

motivated to drink coffee for its sweetened variety than women in comparison (M= 3.58 to M=3.74) although this result wasn't significant with the p-value of 0.236.

An analysis by residential area indicates that individuals residing in both urban and rural areas value the taste and stimulating effects of coffee highly (Table 5). The highest reported averages in both categories, 4.48 in urban areas and 4.42 in rural areas emphasise the general enjoyment of the taste of coffee. Similarly, the energy provided by coffee was a key factor in its appeal, with mean values exceeding 4.14, suggesting the centrality of coffee in supporting daily energy needs. By contrast, the health benefits of coffee were of minimal interest to consumers, with the lowest mean values being 3.74 for urban dwellers and 3.53 for rural dwellers. This suggests that health considerations played a relatively minor role in influencing coffee consumption decisions.

The most significant difference arose in the preference for sugary drinks. This was the only factor for which a significant difference in motivation was observed (p = 0.007), with urban consumers showing a slightly higher mean (M = 3.86) compared to their rural counterparts (M = 3.79). This revealed a difference in taste preferences, with urban dwellers showing a greater preference for sweetness in coffee drinks. This finding indicated that sweetness is a significant differentiating factor in coffee consumption habits between urban and rural settings.

Table 6 Motivation of the coffee drinkers divided by gender and residential area

Motivation Factor	Total Sample N = 260 M ± SD	Female N = 156 M ± SD	Male N = 94 M ± SD	p-value*	Total Sample N = 260 M ± SD	Urban N = 107 M ± SD	Rural N = 153 M ± SD	p-value*
Aroma	4.44 ± 0.70	4.49 ± 0.68	4.38 ± 0.71	0.219	4.43 ± 0.651	4.47 ± 0.731	4.41 ± 0.622	0.397
Taste	4.43 ± 0.66	4.47 ± 0.64	4.40 ± 0.67	0.404	4.44 ± 0.698	4.48 ± 0.692	4.42 ± 0.675	0.205
Energy	4.21 ± 0.87	4.25 ± 0.81	4.19 ± 0.94	0.613	4.21 ± 0.872	4.14 ± 0.936	4.25 ± 0.823	0.433
Variety	4.02 ± 0.83	4.01 ± 0.83	4.06 ± 0.82	0.608	4.02 ± 0.826	4.06 ± 0.867	4.03 ± 0.928	0.426
Social benefits	3.99 ± 0.94	4.01 ± 0.89	3.94 ± 1.00	0.541	4.0 ± 0.936	3.94 ± 0.95	3.99 ± 0.799	0.434
Health benefits	3.76 ± 0.87	3.72 ± 0.85	3.86 ± 0.85	0.228	3.67 ± 1.013	3.74 ± 0.925	3.53 ± 1.026	0.754
Sweet drinks	3.66 ± 1.02	3.74 ± 1.00	3.58 ± 1.03	0.236	3.77 ± 0.866	3.86 ± 0.966	3.79 ± 0.824	**0.007**

N = total number, M = Mean of Likert scale answers, SD standard deviation of mean, * p-value was calculated from the Mann-Whitney U Test.

Motivation for not drinking coffee focused on gender and residential area

In addition to positive motives, respondents identified some barriers to coffee intake (Table 7). Acid sensitivity and sleep disturbance were more concerning (M = 3.94 and 3.89, respectively), with minor gender differences that were not statistically significant. Females evaluated acid sensitivity slightly higher (M = 4.16) than males (M = 3.56), suggesting that females are more sensitive to coffee's acidic characteristics.

In contrast, lifestyle compatibility with coffee intake is more relevant to males (M = 4.00) than females (M = 3.62), implying that daily routines and habits may influence male coffee consumption decisions. Allergies and intolerances are the least concerned reasons to avoid coffee, with an overall impact (M = 2.68) and a slight variation in concern between males and females. The statistics indicate that, while individual sensitivities and lifestyle variables are considered, they are not significant barriers to coffee intake for the examined group.

In the analysis of non-coffee drinkers, divided into urban and rural categories, identified noteworthy differences (Table 6). Across all subjects, acid sensitivity was perceived to be a significant deterrent, with a mean of 3.85. There was no notable variation between urban (M = 3.77) and rural (M = 3.88) areas.

In contrast, sleep disruption was a notable factor, particularly among rural non-coffee drinkers who rated it significantly higher (M = 4.04) compared to urban individuals (M = 3.31), as evidenced by a p-value of 0.037. Health concerns mirrored this pattern, showing a significant difference with rural respondents expressing greater concern (M = 4.00) than urban residents (M = 3.23), which corresponded with a p-value of 0.043. These figures suggested that rural inhabitants were more impacted by or aware of the health and sleep implications associated with coffee consumption.

The mean score for urban respondents was considerably lower (M = 2.85) than that of rural residents (M = 4.00), with a p-value of 0.003, indicating a significant difference. Rural non-coffee drinkers perceived that their lifestyle was more aligned with not consuming coffee, potentially influenced by cultural or environmental considerations that discourage coffee consumption.

Table 7 Motivation to not drink coffee focused on gender and residential area

Motivation Factor	Total Sample N = 39 M ± SD	Female N = 27 M ± SD	Male N = 12 M ± SD	p-value*	Total Sample N = 39 M ± SD	Urban N = 13 M ± SD	Rural N = 26 M ± SD	p-value*
Acid sensitivity	3.94 ± 1.06	4.16 ± 0.85	3.56 ± 1.33	0.127	3.85 ± 1.04	3.77 ± 1.01	3.88 ± 1.07	0.713
Sleep disruption	3.89 ± 1.02	3.84 ± 0.99	4.22 ± 0.97	0.325	3.79 ± 1.00	3.31 ± 0.95	4.04 ± 0.96	**0.037**
Health concerns	3.81 ± 1.09	3.92 ± 1.04	3.70 ± 1.16	0.587	3.74 ± 1.07	3.23 ± 1.01	4.00 ± 1.02	**0.043**
Caffeine sensitivity	3.76 ± 0.98	3.85 ± 0.95	3.56 ± 1.13	0.444	3.72 ± 0.97	3.46 ± 0.97	3.85 ± 0.07	0.219
Lifestyle behaviour	3.71 ± 1.17	3.62 ± 1.13	4.00 ± 1.32	0.425	3.62 ± 1.12	2.85 ± 0.90	4.00 ± 1.02	**0.003**
Taste of coffee	3.40 ± 1.06	3.44 ± 1.00	3.22 ± 1.30	0.609	3.36 ± 1.01	3.36 ± 1.01	3.54 ± 0.99	0.134
Costs	3.38 ± 1.10	3.46 ± 1.06	3.33 ± 1.22	0.775	3.33 ± 1.03	3.23 ± 1.24	3.38 ± 0.94	0.826
Smell of coffee	3.12 ± 1.20	3.17 ± 1.17	3.11 ± 1.36	0.908	3.310 ± 1.12	3.23 ± 1.30	3.04 ± 1.04	0.670
Allergies or intolerances	2.68 ± 1.20	2.58 ± 1.25	3.11 ± 0.93	0.259	2.59 ± 1.14	2.54 ± 1.199	2.62 ± 1.13	0.735

Note: N = total number, M = Mean of Likert scale answers, SD = standard deviation of mean, all the significant results are in the bolt, * p-value was calculated from the Mann-Whitney U Test.

Frequency and place of different types of coffee

The numerical analysis of survey data reveals significant trends in coffee drinking habits (Table 8). Notably, 37.56% of people drink "3 in 1 instant coffee" on a daily basis, demonstrating its popularity among the studied population. Furthermore, instant coffee emerges as a popular choice across a range of consumption frequencies, with 35.52% of respondents reporting daily use. In contrast, more complicated coffee preparations such as cappuccinos and lattes have lower daily consumption rates, with only 20.63% and 19.25% of respondents, respectively, partaking in these beverages every day and also those types of coffee were mostly selected as drinking "a few times a month" where cappuccino with the highest percentage of 53.13% and second in the row was a latte with 49.69%. The data showed a wide range of consumption behaviours, with differing frequencies reported across coffee types.

**Table 8 Frequency of different types of coffee**
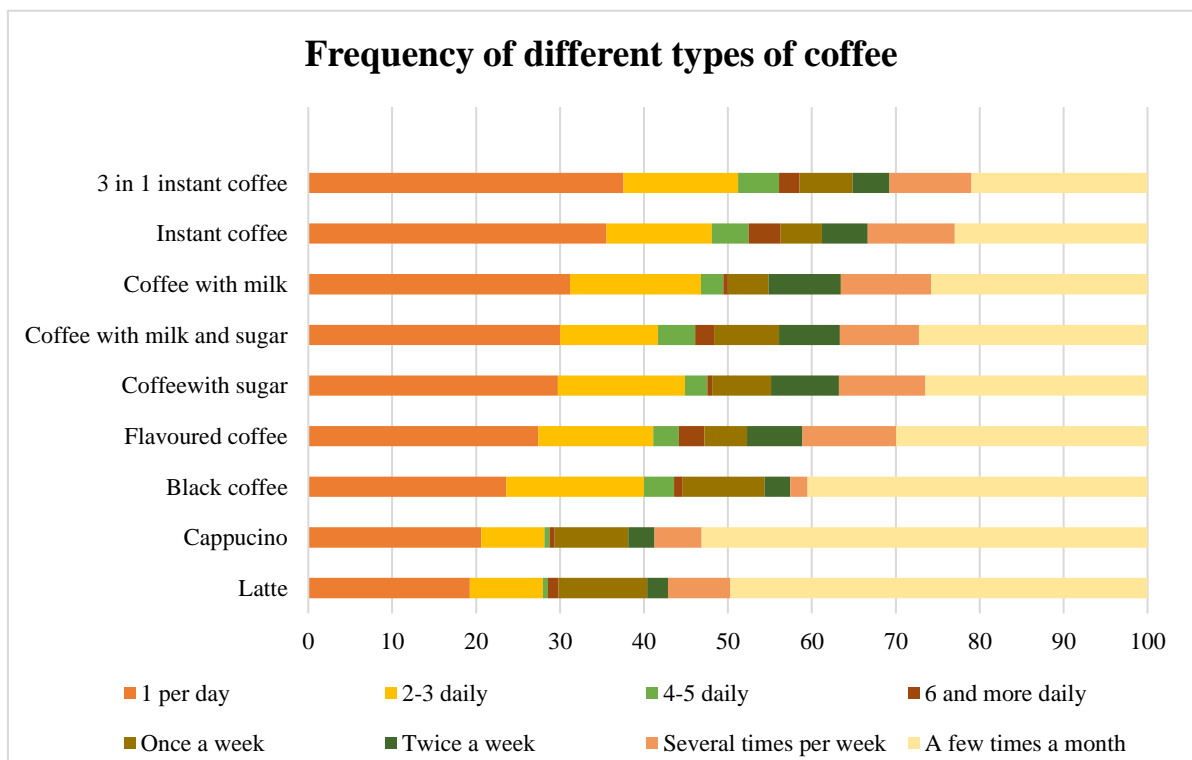
A place for drinking coffee

Concerning the place of drinking coffee the majority prefer to drink coffee at home, based on Table 9, it is 84% of men and 87% of women. On the other hand, only

46

15% of males and 22% of females buy coffee to go. The difference highlights the significant impact that homes have on people's coffee consumption habits.

Table 9 Place for drinking coffee divided by gender
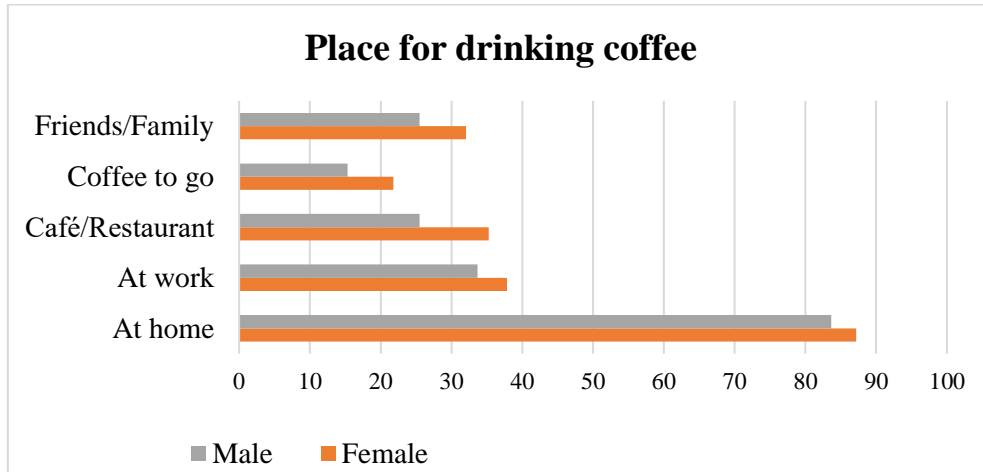
5.2. Factors Discovering the Environmental Concerns and Recycling

A gender-based analysis was conducted to examine the attitudes of individuals towards environmental concerns and recycling practices related to coffee consumption (Table 10). The results indicated that the average awareness of the environmental consequences of using plastic coffee cups was considerable, with an overall sample mean of 3.98 points (Table 9). A marginal difference was observed in the level of concern expressed by men (M = 4.08) and women (M = 3.92). However, this difference did not reach statistical significance (p = 0.118).

When examining recycling practices, a compelling pattern emerged: general waste disposal was more frequently chosen by men (M = 4.30) compared to women (M = 4.09), and this difference proved statistically significant (p = 0.023). Conversely, both genders exhibited comparable behaviours in terms of the utilisation of recycling bins and the exertion of effort to locate recycling bins when they were not immediately available. This indicates an overall consistent attitude of coffee consumers towards environmentally friendly practices.

Also, a study was conducted to analyse the attitudes of individuals from urban and rural areas towards environmental issues and recycling practices related to coffee

consumption. The mean score of concern about environmental consequences for urban (M = 3.29 ± 1.09) and rural (M = 3.46 ± 1.16) residents indicated moderate awareness, although the difference was not statistically significant (p = 0.180).

A significant difference was observed in the frequency of use of disposable plastic cups, with rural respondents reporting less frequent use (M = 2.18 ± 0.86) than urban respondents (M = 2.50 ± 1.11). This difference reached statistical significance (p = 0.022). In terms of proactive recycling behaviour, rural respondents reported more frequent use of recycling bins (M = 3.54 ± 1.27) than urban individuals (M = 3.17 ± 1.39), a finding that also reached statistical significance (p = 0.035). This indicates greater engagement in recycling practices among the rural population.

These findings demonstrated that although both urban and rural populations were aware of the environmental impacts of their coffee consumption, there were significant differences in their recycling behaviour. Rural individuals demonstrated a more proactive approach to environmental care in certain aspects.

Table 10 Comparison of Concerns and Practices Related to Coffee Consumption focused on Gender and Residential areas

	Total Sample N = 254 M ± SD	Female N = 156 M ± SD	Males N = 98 M ± SD	p-value*	Total Sample N = 254 M ± SD	Urban N = 103 M ± SD	Rural N = 151 M ± SD	p-value*
Factors discovering the concern								
Health concerns from coffee	3.39 ± 1.13	3.44 ± 1.13	3.31 ± 1.14	0.383	3.39 ± 1.13	3.29 ± 1.09	3.46 ± 1.16	0.180
Plastic cups' environmental impact	3.98 ± 0.98	3.92 ± 0.96	4.08 ± 1.01	0.118	3.98 ± 0.99	3.96 ± 1.04	4.00 ± 0.95	0.933
Using personal cup on purchases	3.17 ± 1.18	3.19 ± 1.10	3.16 ± 1.30	0.899	3.19 ± 1.18	3.17 ± 1.15	3.20 ± 1.20	0.843
Discount for bringing own cup	3.44 ± 1.15	3.51 ± 1.10	3.33 ± 1.21	0.265	3.44 ± 1.15	3.62 ± 1.08	3.32 ± 1.18	**0.042**
Cup Type								
Porcelain/ceramic/glass cup	4.02 ± 1.09	3.99 ± 1.07	4.07 ± 1.24	0.356	4.02 ±1.09	4.10 ± 0.99	3.97 ± 1.16	0.668
One-used plastic cup	2.31 ± 1.00	2.37 ± 0.89	2.23 ± 1.11	**0.045**	2.31 ± 0.98	2.50 ± 1.11	2.18 ± 0.86	**0.022**
Paper cup	2.62 ± 0.91	2.56 ± 0.78	2.71 ± 1.08	0.472	2.62 ±0.91	2.61 ± 0.95	2.63 ± 0.88	0.914
Personal cup for takeaway	3.39 ± 1.33	3.37 ± 1.34	3.44 ± 1.30	0.655	3.39 ± 1.33	3.17 ± 1.39	3.54 ± 1.27	**0.035**
Recycling practises								
General waste disposal	4.17 ± 0.91	4.09 ± 0.91	4.30 ± 0.90	**0.023**	4.17 ± 0.91	4.12 ± 1.01	4.20 ± 0.84	0.900
Recycling bin usage	4.00 ± 1.02	3.99 ± 0.85	4.03 ± 1.03	0.335	4.01 ± 0.92	3.92 ± 1.03	4.07 ± 0.84	0.479
Leave it on the table/bench/etc.	1.88 ± 0.95	1.83 ± 0.83	1.96 ± 1.11	0.797	1.88 ± 0.95	1.90 ± 1.04	1.87 ± 0.88	0.740
Search for a recycling bin (not always available)	3.37 ± 1.15	3.29 ± 1.09	3.48 ± 1.22	0.155	3.37 ± 1.15	3.30 ± 1.26	3.41 ± 1.07	0.542

Note: All the significant results are in the bolt, * p-value was calculated from the Mann-Whitney Test.

5.3.   Health Awareness in Coffee Consumption and Obesity

Furthermore, a detailed analysis of the variation in health knowledge about coffee drinking among four BMI groups, which were methodically classified from underweight to obese, was provided (Table 11).

Group 0, which represents underweight individuals, provides a basic perspective that is compared with the following groupings. Group 1, which represents responders of normal weight, may be expected to mirror conventional health awareness levels. Moving on to Group 2, persons classified as overweight may see an increase in health-related problems as a result of the heightened health risks connected with this category. The investigation concludes with Group 3, which includes respondents who have been diagnosed as obese.

The statistics showed a significant increase in health awareness moreover, this group is the most aware of the link between sugary coffee consumption and obesity (M = 4.32, p = 0.0152).

In addition to concerns over sugary coffee, higher BMI groups are becoming more aware of the benefits of cutting sugar from their diet. Also, Group 3 shows the greatest recognition of this benefit, with a mean score of 4.34, which is statistically significant (p = 0.0108). This evidence suggests that people in this category are not only aware of the risks associated with high-sugar diets but also know of the health benefits of sugar reduction.

The statistical significance found through ANOVA testing in Group 3's responses highlights a direct link between greater BMI and increased health awareness, particularly with the effects of dietary sugar. Furthermore, this group is distinct in recognizing the potential metabolic (M = 3.83, p = 0.0836) and length of life benefits (M = 3.68, p = 0.0338) of coffee drinking. The divergence of Group 3 from the other BMI groups shows that obesity-related experiences or concerns may lead to a more proactive engagement with dietary health information.

Table 11 Health Awareness in Coffee Consumption and Obesity

	BMI Group 0 N = 34 M ± SD	BMI Group 1 N= 171 M ± SD	BMI Group 2 N = 66 M ± SD	BMI Group 3 N = 30 M ± SD	ANOVA P-Value
Sugary coffee contributes to obesity	3.48 ± 0.98	3.90 ± 1.02	4.04 ± 0.94	4.32 ± 0.98	**0.015**
Using less sugar impacts health positively	3.54 ± 1.03	4.04 ± 0.90	4.04 ± 0.84	4.34 ± 0.81	**0.011**
Sweetening coffee*	2.40 ± 0.98	2.36 ± 1.03	2.42 ± 1.14	2.23 ± 1.13	0.881
Health benefits					
Increasing metabolic rate	3.39 ± 0.92	3.77 ± 0.79	3.88 ± 0.80	3.83 ± 1.04	0.084
Play a role in weight loss	3.55 ± 0.99	3.70 ± 0.84	3.67 ± 0.87	3.90 ± 1.01	0.512
Decrease cancer risk	3.18 ± 0.98	3.38 ± 0.87	3.49 ± 0.88	3.63 ± 1.04	0.257
Can lower depression	3.36 ± 0.87	3.44 ± 0.92	3.42 ± 0.99	3.62 ± 1.18	0.747
Have beneficial aspects	3.29 ± 0.94	3.38 ± 0.92	3.41 ± 0.80	3.76 ± 0.99	0.179
Can live longer	2.96 ± 0.88	3.21 ± 0.90	3.21 ± 0.99	3.68 ± 1.02	**0.034**
Health challenges					
Increase heart rate and blood pressure	3.71 ± 0.76	3.99 ± 0.79	3.64 ± 0.85	4.00 ± 1.00	**0.030**
Can lead to headache	3.14 ± 0.80	3.31 ± 0.98	3.39 ± 0.85	3.46 ± 1.17	0.589
Can cause insomnia	3.76 ± 0.91	3.75 ± 0.95	3.88 ± 0.88	3.97 ± 0.91	0.597
Can cause dehydration	3.50 ± 0.96	3.56 ± 0.98	3.66 ± 0.83	3.64 ± 1.13	0.869
Can lead to addiction	3.89 ± 0.85	3.93 ± 0.95	3.86 ± 0.89	3.96 ± 0.92	0.952
Physical activity	3.13 ± 0.99	3.03 ± 1.12	3.03 ± 0.89	2.93 ± 1.01	0.911

Note: Significant values are in the bolt, use of Likert scale from 1-5 (strongly disagree - strongly agree), Sweetening coffee* 1-5 (1- none sugar, 2 – half spoon, 2 – one spoon, 3 – one and half spoon, 4 – two spoons, 5- three spoons of sugar).

5.4.　　　　　　　**Factoring influencing coffee consumption**

The multiple regression analysis revealed the relationship between various predictors (independent variables) and the motivation for coffee consumption (dependent variable) in Table 12. Notably, the findings underscored the significance of several predictors in shaping consumers' coffee consumption motivations.

Of particular interest, gender exhibited a significant negative association with motivation for coffee consumption (β = -0.172, p = 0.018), suggesting that gender differences may influence individuals' propensity towards consuming coffee. Sweetening coffee emerged as a notable predictor positively associated with motivation for coffee consumption (β = 0.080, p = 0.007), indicating that individuals who sweeten their coffee tend to exhibit higher motivation levels. Furthermore, awareness of the health implications of black coffee consumption (β = 0.231, p < 0.001) and awareness of the negative effects of black coffee consumption (β = 0.099, p = 0.036) demonstrated significant positive associations with motivation for coffee consumption, highlighting the essential role of health-related considerations in driving coffee consumption behaviours.

Conversely, predictors such as weight (kg), location, age groups, occupation, body mass index, physical activity, sensory preferences, health concerns, lifestyle and practical considerations, and environmental consciousness and sustainable practices did not exhibit statistically significant associations with motivation for coffee consumption.

The model yields an R-squared value of 0.229, indicating that approximately 22.9% of the variance in motivation for coffee consumption was explained by the included predictors (all independent variables involved in the model). This suggests that while the examined predictors collectively contribute to explaining individuals' motivation for coffee consumption, there remain unaccounted factors influencing this behaviour.

Table 12 Multiple regression analysis of comparing motivational factors

Variables	M ± SD	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Gender	4.07 ± 0.55	-0.172	0.073	-2.37	**0.018**	-0.315	-0.029	**
Weight (kg)	0.44 ± 0.55	0.007	0.006	1.17	0.243	-0.004	0.018	
Residential area	60.3 ± 14.1	0.016	0.065	0.25	0.803	-0.112	0.144	
Age groups	1.59 ± 0.49	0.052	0.035	1.50	0.134	-0.016	0.121	
Occupation	1.81 ± 1.05	-0.078	0.096	-0.82	0.413	-0.267	0.110	
Body Mass Index	1.15 ± 0.36	-0.009	0.015	-0.56	0.578	-0.039	0.022	
Physical Activity	23.6 ± 4.79	-0.004	0.031	-0.14	0.891	-0.065	0.056	
Sensory Preferences	3.03 ± 1.07	-0.08	0.055	-1.45	0.149	-0.189	0.029	
Health Concerns	2.79 ± 0.80	0.014	0.069	0.20	0.841	-0.122	0.150	
Lifestyle and Practical Considerations	3.35 ± 0.58	-0.047	0.054	-0.86	0.39	-0.154	0.060	
Sweetening Coffee	3.02 ± 0.84	0.08	0.029	2.73	**0.007**	0.022	0.138	***
Environmental Consciousness and Sustainable Practices	2.42 ± 1.12	0.116	0.080	1.45	0.148	-0.041	0.274	
Awareness of Health Implications of Black Coffee Consumption	3.30 ± 0.42	0.231	0.046	4.97	**0.001**	0.140	0.323	***
Awareness of Negative Effects of Black Coffee Consumption	3.52 ± 0.72	0.099	0.047	2.11	**0.036**	0.007	0.192	**
Constant	3.69 ± 0.70	2.497	0.381	6.56	**0.001**	1.746	3.247	***

Note: Significant values are in the bolt.

Mean dependent var	4.074		
R-squared	0.229	SD dependent var	0.554
F-test	5.231	Prob > F	0
Akaike crit. (AIC)	395.31	Bayesiancrit. (BIC)	448.835

*** p<.01, ** p<.05, * p<.1

6.   Discussion

6.1.   Factors Determining Coffee Consumption

The consumption trends observed in the Philippines indicate a preference for convenient and sweetened coffee options, such as "3-in-1 instant coffee" and "coffee with milk and sugar." This preference aligns with the broader Asian market, where convenience and sweetness were identified as key factors influencing beverage choices (Euromonitor International 2021). This contrasted with European preferences for freshly produced varieties and an increasing interest in speciality coffee, indicating a difference in flavour and preparation methods (Specialty Coffee Association 2020).

Although the home remained the most popular site for coffee consumption in the Philippines, Filipino women were more likely than males to drink coffee in company outside the home. This tendency contrasts with Europe, where coffee culture is prevalent across all genders, reflecting the cultural tradition of public life and socialisation around coffee (European Coffee Federation, 2019). Nevertheless, the expansion of café culture in Asian metropolises, particularly in the Philippines, indicated a more European-like transformation in coffee consumption outside the home (Simpson 2008).

The results indicated that there are gender-specific preferences in coffee consumption. Women tend to prefer coffee with a strong flavour and aroma, and they were more inclined towards sweetened coffee. In contrast, men were focused more on the health benefits and variety of coffee. These observations were consistent with previous studies such as Yamazawa et al. (2007), which noted that women prefer sweeter coffee. These results contrasted with those of Samoggia et al. (2020) and Rodenburg et al. (2012), where health and functional benefits were emphasised but not specifically linked to gender as strongly as the findings suggested.

Moreover, studies such as Watson et al. (2018) demonstrate that there are no significant gender differences in health-focused food choices. This suggests that health motivations may be universally important for all genders. However, Carvalho and Spense et al. (2018) found that men tend to experiment more with coffee types, which supports the idea that men value variety in their studies. Furthermore, O'Neill & Williams (2015) and Martínez et al. (2019) demonstrated that cultural factors significantly influence

gender preferences in beverage consumption, indicating that the observed gender differences may also reflect cultural or regional specificities of the study group. This implied that while general trends in sensory and health motivation are noted, research findings highlighted more pronounced gender differences, particularly in how men value health and diversity.

In terms of coffee consumption motivation in the Philippines, it was shown that urban inhabitants had a significantly lower motivation to drink sweetened beverages, whilst rural residents had a larger preference for sweetened beverages in their coffee. This urban-rural divide contrasts with the findings of Yamazawa et al. (2007), who found no significant difference in sweetness preference between urban and rural Japanese coffee drinkers, implying that the Philippine context may have different cultural influences on flavour preferences.

The findings also revealed a considerable disparity in how coffee drinking fits into the lifestyles of urban and rural populations. Respondents from rural regions ranked coffee as a more important part of their daily lives, which is consistent with the findings of Pramudya et al. (2018), who identified coffee as a general staple in less urbanized groups. However, this rural emphasis contrasted with the smaller relevance of coffee in the urban lifestyle, which appeared to contradict the study by Lombardo et al. (2019), which revealed no significant difference in the integration of coffee intake into the lifestyle.

6.2. Factors Determining the Environmental Concerns and Recycling practises

Research on gender differences in environmental attitudes, particularly in relation to coffee consumption and recycling behaviour, has presented a mixed picture. Although women are commonly reported to exhibit higher levels of environmentally friendly behaviour and environmental concerns (Zelezny et al. 2000;Vainio & Paloniemi 2014), findings from a study in China suggest that men display more positive environmental attitudes and they have more substantial environmental knowledge (Mostafa 2007). This is in contrast to the gender trends observed in the study discussed, where men showed marginally more interest in the environmental impact of plastic cups.

The significance of these findings, particularly where men were more inclined to properly dispose of general waste, challenges the stereotype of women being more environmentally active and raises questions about social norms that may influence this behaviour. It has been argued that environmental behaviours have strong links to femininity and that behaviours such as energy conservation and carbon reduction are less associated with masculine traits such as ability and ambition (Brough et al. 2016). However, men's and women's different personal values contribute to their attitudes and motivations towards green consumption, and these attitudes are also greatly influenced by social norms (McCright & Sundström 2013;Alibeli & White 2011;Stern 2000).

A critical evaluation of gender-specific environmental behavior must therefore take into account both individual and sociocultural influences. Gender as a social construct includes different social norms, beliefs and behaviours that society deems appropriate for men and women, which can influence green consumption behaviour (Pickett-Baker & Ozaki 2008, World Health Organization 2002). Whether men or women are more environmentally friendly is still debated in academic research, as there are opposite conclusions (Pickett-Baker & Ozaki 2008;Mostafa 2007) suggesting a complex and sometimes contradictory relationship between gender and the environment. behaviour.

6.3. Factors Determining the Health Awareness in Coffee Consumption

A significant correlation was found between the consumption of sweetened coffee and weight concerns in the BMI 3 (obesity) group. This group demonstrated a notable awareness of the beneficial effects of reducing sugar intake, which correlated with global health guidelines aimed at reducing obesity (WHO 2024, Barros et al. 2022). A study by Schwingshackle et al. (2016) corroborates these concerns and identifies sugar-sweetened beverages as a dietary factor contributing to obesity. Another report by Wasim et al. (2020) confirms the link between high sugar consumption and the risk of developing obesity-related diseases.

Conversely, there was variability in coffee-related health awareness across BMI 0 (underweight) to 2 (overweight) groups. While the lower BMI groups recognised the

potential health benefits of coffee, such as increasing the metabolic rate and weight management, their concerns were less acute than in group 3. This difference in perception between the lower BMI groups is consistent with the findings of Jeukendrup & Randell (2011), who emphasise the role of coffee in energy metabolism.

The BMI 3 group demonstrated a notable awareness of coffee's potential to exacerbate health issues such as elevated heart rate and blood pressure. A study by Altesha et al. (2019) and Farkouh and Greenberg et al. (2009) on the cardiovascular risks associated with excessive caffeine intake suggests that individuals with obesity may possess greater awareness and a more cautious approach to coffee consumption due to potential health risks.

6.4.   Factors Determining the Motivational Factors on Coffee Consumption

The multiple regression analysis conducted in this study clarified the relationship between various predictors and motivation to consume coffee. Notably, the findings were corroborated by existing literature on the effect of gender on coffee consumption behaviour. A significant negative association was identified between gender and motivation to consume coffee, which is consistent with previous studies (Chen et al. 2021; Wee et al. 2020; Pham et al. 2019).

Furthermore, coffee alignment emerged as a significant predictor, positively associated with motivation to consume coffee. This finding is consistent with previous research suggesting that individuals who align their coffee tend to exhibit higher levels of motivation to consume (Choi 2020). Furthermore, a significant positive association was observed between awareness of the health consequences of black coffee consumption and motivation to consume coffee, in line with the findings of Gupta et al. (2017) and Wee et al. (2020).

In contrast, several predictors, including weight, location, age groups, occupation, body mass index, physical activity, sensory preferences, health concerns, lifestyle and practical considerations, and awareness of environmental and sustainable practices, did not show statistically significant associations with motivation to consume coffee. Although these findings appear to conflict with some previous studies (Torres-Collado et

al. 2021; Park et al.2018), they emphasise the complex nature of motivation to consume coffee and highlight the necessity for further investigation into the nuances of these variables.

6.5.   Limitations of Research

When considering the limitations of this research, it should be noted that we relied on self-reported data to assess health awareness and behaviour in relation to coffee consumption, which carried a potential risk of bias. Participants' responses may have not fully captured the complexity of their dietary habits or their understanding of the impact of coffee on health. The cross-sectional design of the study limited the ability to draw causal inferences between coffee consumption patterns and health outcomes based on the data provided.

In addition, the categorisation of respondents by BMI as an indicator of health status may have oversimplified the relationship between coffee consumption and overall health status. While body mass index is a useful tool, it may not always accurately reflect an individual's health status or risk factors (WHO 2024; Vera 2022). This categorisation could have potentially obscured the nuances of individual metabolic differences and the multifactorial nature of diseases such as obesity and diabetes.

The size of the study is also a factor to consider. Focused on the specific health benefits and problems of coffee, such as its association with obesity, cardiovascular health and neurodegenerative diseases, did not take into account all the health aspects of coffee consumption. In particular, the association between coffee consumption and sleep quality or its potential role in anxiety and bone density were not areas for further investigation (Santos et al. 2019; O'Callaghan et al. 2018).

The environmental context of the Philippines, with its increasing prevalence of fast-food consumption and availability of sugary drinks, also presented unique challenges that may influence study outcomes. These factors, coupled with current regulations on sugar-sweetened beverages, may have significantly influenced the dietary habits and perceptions of the population regarding coffee (Ilic 2023; Ramos & Bulusan 2020).

While these limitations provided critical insights for future research, they underscored the complexity of nutrition-related behavioural research and the multiple

influences on health attitudes and practices. They also highlighted the importance of a comprehensive approach that includes longitudinal designs, objective measures of health status, and consideration of broader dietary patterns for a more holistic understanding of the health consequences of coffee consumption.

Suggestions for Future Research

Building on the current study, future research could deepen the exploration of health consciousness in coffee consumption by adding qualitative data. Conducting individual interviews could provide a deeper insight into the personal attitudes, behaviours and reasons behind students' coffee choices. Thematic analysis of interview transcripts may identify common patterns and unique perspectives that quantitative methods alone may not reveal.

In addition, refining the survey with more targeted questions could focus on specific areas of interest uncovered in the initial research. Questions could address the nuances of students' health beliefs about coffee, such as their perceptions of the risks and benefits of caffeine, the impact of coffee on mental health, and their understanding of the impact of additives such as sugar and cream on health.

Finally, a longitudinal approach would allow us to track how students' attitudes and behaviours change over time, particularly as they are exposed to new information or changes in health trends. This could be particularly valuable in assessing the impact of health promotion efforts on coffee consumption habits over the course of their studies.

These methodological enhancements would not only address some of the limitations of current research but also provide a comprehensive understanding of health awareness in relation to coffee consumption, paving the way for more informed health interventions and education.

7.   Conclusions

The present study examined the multifaceted motives underlying coffee consumption among young individuals in the Philippines, illuminating their perceptions and behaviours related to coffee and its effects on health. The results indicated that taste and aroma were significant drivers of coffee consumption, while health concerns and the pursuit of variety often resulted in coffee abstinence. Additionally, the impact of discounts on promoting the use of reusable cups in cafés was less pronounced than anticipated, suggesting that financial incentives alone may not be sufficient to alter consumer behaviour.

When addressing health perceptions, a clear trend was observed where individuals with higher BMI levels showed greater concern about the relationship between sweetened coffee and obesity. This indicated an awareness of the potential health consequences of coffee and pointed to the importance of educating consumers about healthier coffee consumption habits.

Regarding the link between obesity and lifestyle choices such as sweetening coffee, the findings showed that individuals with obesity were indeed more aware of the adverse effects of adding sugar to coffee. This awareness could be employed to promote healthier lifestyles and support the development of public health strategies.

This work contributed to a more comprehensive understanding of the dynamics of coffee consumption within a specific cultural and educational environment. The findings may inform the design of health interventions and commercial strategies that align with the preferences and awareness levels of different consumer segments. Future research should examine the effectiveness of educational campaigns on healthier coffee consumption and the impact of environmental awareness on consumer choices. Furthermore, extending this research to encompass a more diverse demographic could provide insight into the applicability of these trends to the broader population.

In conclusion, the study's findings provided valuable insight into the factors affecting coffee intake and abstinence among Philippine university students. The findings pointed to a variety of complex motivation and health-related factors that were influenced by local circumstances but also represented global trends.

8.   References

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Appendix 1: Survey

Design of the questionnaire

From Aromatic Pleasure to Health and Environmental Concerns

Dear Madam/Sir,

I would like to kindly ask you to fill in a short questionnaire targeted at coffee consumers in the Philippines. This research is conducted in collaboration between the Czech University of Life Sciences Prague (the Czech Republic) and Visayas State University (Philippines).

It will take you only a maximum of 5 minutes to complete the survey questionnaire. The results of this study will be used for the scientific purposes of the master's thesis. All data will be treated anonymously in accordance with EU GDPR regulations. Feel free to share the survey.

Thank you very much for your responses.

Klára Navrátilová

1. **Do you drink coffee YES/ NO**

2. **What is your main motivation to drink coffee?**

Motivation to drink coffee	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I like the taste of coffee					
I like the aroma					
I like sweet drinks					
I like the variety of coffees					
I need energy					
I appreciate the social benefits (time with family and friends)					
I think it has health benefits					
Other reason: please specify					

3. What is your main motivation not to drink coffee?

Motivation to not drink coffee	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Caffeine Sensitivity					
Taste of coffee					
Acid Sensitivity					
Costs					
Health Concerns					
Allergies or Intolerances					
Lifestyle behaviour					
Sleep Disruption					
Other reason: please specify					

4. Choose which type of coffee do you drink.

I drink following type of coffee	1 per day	2-3 per day	4-5 per day	6-8 per day	9and more per day	Several times per week	Occasionally
Black coffee							
Coffee with milk							
Coffee with sugar							
Coffee with sugar and milk							
Instant coffee							
3 in 1 coffee							
Flavoured coffee (Caramel, vanilla, chocolate)							

5. Do you sweeten your coffee? YES/NO

How much sugar do you put into your cup of coffee?	Half of teaspoon	1 teaspoon	2 teaspoons	3 teaspoons	None
I put sugar into my cup of coffee					

6. Where do you mostly drink coffee?

At work	Café/ Restaurant	Coffee to go	At home	Friends/Family

7. How much concerned are you about:

	Extremely concerned	Very concerned	Concerned	Slightly concerned	Not concerned at all
Health impact on drinking coffee					
Environmental impact of using plastic cups for coffee					

8. What type of cup do you most often use when drinking coffee?

	Always	Most of the time	Often	Occasionally	Never
Porcelain/ceramic/glass cup					
One-used plastic cup					
Paper cup					
My own cup, while taking coffee away					

9. Where do you usually throw away the one-used cup?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I recycle it in a recycling bin.					
I dispose of it in the general waste/trash bin.					
I often leave in on the table/bench/etc.					
I try to find a recycling bin, but it is not always available.					

10. How much do you agree that:

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I bring my own cup if I buy coffee to go					
I would bring my own coffee cup to go if I got a discount					
Sugary coffee consumption contributes to obesity					
Reducing sugar in coffee can positively impact your weight					

11. Are you aware of:

Drinking coffee	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Lower risks of Parkinson's and Alzheimer's disease					
Play role in weight loss					
Decrease risk of developing certain cancers					
Has a beneficial effect on the functioning of the nervous system					
Has beneficial effect on cardiovascular system and on kidney functions					
Has effect on insomnia and sleep disruption					
Has effect on nervousness					
Increase heart rate and blood pressure					
Can lead to dehydration					
Can lead to addiction					

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13. How often do you do a physical activity (e.g., exercise, active hobbies)?

Very often (5 or more times a week)	Regularly (2-4 times a week)	Occasionally (1 a week)	Rarely (a couple times per month)	Never

14. Socio-economic factors of the respondents:

- Age:

- Gender:

- Height (cm):

- Weight (kg):

- Location (urban/rural):

- Occupation (Bachelor's student, Master's student, PhD student, Employee of the VSU)