

Master of Science in Public Health



***CUSTOMERS OPINION ON USAGE OF PLASTIC
BAGS WITH ENVIRONMENTAL FRIENDLY
BAGS AMONG GENERAL PUBLIC OF
ISLAMABAD***

By

(Alishba Javed)

**Al-Shifa School of Public Health, PIO,
Al Shifa Trust Eye Hospital
Quaid-i-Azam University
Islamabad, Pakistan**

(2021-2023)

*(Customers opinion on usage of Plastic Bags with
Environmental Friendly Bags among General Public of
Islamabad)*

(Alishba Javed)

(Registration Number:362875-PIO/MSPH-2021)

Dissertation submitted in partial fulfilment of the requirement for the
degree of:

MASTER OF SCIENCE IN PUBLIC HEALTH (2023)

To

**Al-Shifa School of Public Health, PIO, Al Shifa Trust Eye Hospital,
Faculty of Medicine
Quaid-i-Azam University,
Islamabad.**

Word Count: 10220

Declaration

In submitting this dissertation, I certify that I have read and understood the rules and regulations of DPH and QAU regarding assessment procedures and offences and formally declare that all work contained within this document is my own apart from properly referenced quotations.

I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

Dr Saman Waqar

(Name of Supervisor)

Date: 15-03-2023

Al-Shifa School of Public Health,
PIO, Al Shifa Trust Eye Hospital

Alishba Javed

(Name of Student)

(362875-PIO/MSPH-2023)

MSPH (2023)

Date: 15-03-2023

Abstract

Introduction

Despite the increasingly widespread popularity of plastic bags there are limited comprehensive studies on the effects of usage and frequency of plastic bags and its consequences on environment and public health. Therefore, this study finds out the perception of plastic bags ban and using environment friendly bags.

Objectives

The study was carried out to find out the prevalence of plastic bags and ecofriendly bags use and to find out the association of plastic bags ban with using environmental friendly bags.

Methods

A cross sectional study was conducted among general public of Islamabad. Data was collected by interview based adapted questionnaire with a Cronbach's alpha of 0.7. It contained questions regarding demographic characteristics, environmental impacts of using plastic bags and perception of respondents about using ecofriendly bags. Data was collected by simple random sampling method. Chi square test was applied to check the association of plastic bags ban and customers perception about environmental friendly bags.

Results

A total of 328 participants from general public took part in the study, among 58.2% males and 41, 2% females aged 18years and above completed the questionnaire. The results showed significant association of plastic bags ban and customers opinion of using environmental friendly bags with $p\text{-value} < 0.05$ which is significant.

Conclusion

The use of plastic bags is much common in Pakistan and it affects environment badly. The customer's opinion about ban on using plastic bags and using environmental friendly bags have significant association. The Government need to make policy to reduce plastic pollution curtailing with Sustainable developmental Goals.

Keywords

Plastic bags, Environmental pollution, biodegradable plastic bags, ecofriendly.

Acknowledgments

First and foremost, I am thankful to Allah WHO blessed me with strength and courage to show my potential in the field of public health.

I dedicate my thesis to my **parents**, Thank You so much for being with me through thick and thin and supporting me throughout my career.

To my supervisor **Dr Saman Waqar**, who is a beautiful human being, for believing in me and motivating me throughout the 2 years of MSPH Thank you Ma'am, I am indebted for life, for this huge support from you.

I owe thanks to my friends for their continued and unfailing love, support and understanding during my pursuit of Master's degree that made the completion of thesis possible.

I also place on record, my sense of gratitude to all who, directly or indirectly, have lent their helping hand in this venture.

Table of contents

Chapter	Page
	ii
Declaration	iii
Abstract	iv
Introduction	iv
Methods	iv
Results	iv
Conclusion	iv
Keywords	iv
Acknowledgments	v
Table of contents	vi
List of tables	viii
List of figures	ix
Acronyms	x
CHAPTER I: INTRODUCTION	1
1.1 Rationale	4
1.2 Objectives	4
CHAPTER II: LITERATURE REVIEW	5
2.1 Pollution and Public opinion on plastic bags usage	5
2.2 Plastic pollution and urban flooding	5
2.3 Environmental impacts of plastic bags usage	6
2.4 Plastic bags and danger to sea life	6
2.5 Pollution taxes and bans	7
2.6 People; using ecofriendly bags	8
2.7 Plastic bags and public health	8
2.8 Beating plastic pollution, REDUCE, REUSE, RECYCLE	9
2.9 Operational definitions	10
2.9.1 Plastic bags	10
2.9.1 Opinions	10
2.9.3 Plastic pollution and environment	10
2.9.4 Biodegradable bags	10
2.9.5 Environmental friendly	10
CHAPTER III: METHODOLOGY	11
3.1 Study design and duration	11
3.2 Study setting	11
3.3 Study participants	11
3.4. Objectives	11
3.4.1 Inclusion criteria	11
3.4.2 Exclusion criteria	11
3.5 Sample size calculation	12
3.6 Sampling strategy	12
3.7 Study variable	13
3.8 Data collection instrument	13
3.9 Pilot testing	13
3.10 Reliability and validity	13
3.11 Data collection procedure	13
3.11.1 Data analysis procedure	14

3.12 Ethical consideration	14
CHAPTER IV: RESULTS	15
4.1 Sociodemographic profile of respondents	15
4.2 Frequency and percentage of Environmental impacts of plastic bags	17
4.3 Frequency and percentage of use of plastic bags by professionals	20
INFERENTIAL STATISTICS	21
4.4 Association of plastic bags usage with environmental friendly methods	21
	22
CHAPTER V DISCUSSION	23
5.1 Strengths	26
5.2 Limitations	26
CONCLUSION	27
RECOMMENDATION	28
REFERENCES	29
Annexure –A Questionnaire	32
Annexure B -Consent form	35
Annexure- C IRB Letter	37
Annexure –D Budget	38
Annexure –E GANTT Chart	39

List of tables

Table	Page
Table 1 Socio demographic profile of respondents	15
Table 2 Frequency and percentage of environmental impacts of plastic bags	19
Table 3 Frequency and percentage of consumption of plastic bags by respondents	20
Table 4 Association of plastic bags usage with environmental friendly methods	21

List of figures

Figure	Page
Figure 1 Effects of micro plastics in Aquatic eco system(La Daana, Asmath et al. 2022)	7
Figure 2 Reason of plastic bags usage	17
Figure 3 Frequency of market visits by respondents	17
Figure 4 Usage of plastic bags by Respondents	18
Figure 5 Use of alternatives by respondents	18
Figure 6 Impacts of Plastic waste	20

Acronyms

WHO	World health organization
UN	United Nations
GOP	Government of Pakistan
PCR	Post-Consumer Recycled
PVC	Poly Vinyl Chloride
SPSS	Statistical package for the social sciences

CHAPTER I: INTRODUCTION

The plastics bags has revolutionized the industrial world and there is no phase in manufacturing to utilization, where plastic bags are not used. This is convenience and cost of the plastic bags is so low that everyone uses it in daily households. Plastic bags are the most preferred product of choice till today. From food manufacturing industry to food stores, from cloths manufacturing to outlets in everything we use; there is a big role of plastic bags to carry the stuff easily.(Joseph, Kumar et al. 2016)

In olden time when there was no concept of plastic bags, people use to have traditional cloth bags ; in which they use to carry things, but with the advancement in science and technology and in the time of industrialization, plastic bags become the point of attraction both for the buyers and sellers. The industries after making its product use to pack their products in fancy plastic packing for marketing of their products. However, the use of plastic bags are this much that we are addicted to use it almost daily, and this very practice is common around the globe.(Yalwaji, John-Nwagwu et al. 2022)

Every year around 1 trillion plastic bags are made as they are cheap and versatile. The most important thing about plastic bags is that they can be re cycled over and over to create valuable post-consumer recycled resins.(Ganesan, Ruendee et al. 2022) These resins can be converted in other forms as a host of other products. Plastic bags are made from **polyethylene**, which begins as ethylene extracted from natural gas or oil. It is specially treated to become a polymer. Polyethylene is changed to fit how it will be used and the different types of bags to be produced.(Kochanska, Wozniak et al. 2022)

Furthermore, in last decade the use of plastic bags has become a serious concern about environmentalist and public health professionals, a rethinking about its impact on environment and sustainability is gradually putting a break on its continuous use. The research based on plastic bags use proves its bad effects on nature and towards health in many direct and indirect ways. The materials like phthalates are esters of phthalic acid are mainly used as substances added in formation of plastic bags. Similarly PVC is widely used material. (Nikiema and Asiedu 2022)

Furthermore, plastic bags play an increasing role in packaging and consumer products, it has also taken the up growing percentage of municipal solid waste streams and pose environmental challenges. Plastics also have attracted severe criticism from environmentalist as it is not bio degradable. However, plastic materials take about 100 to 1000 years to degrade, till that time the landfills become polluted and air pollution and water pollution also destroys the environment.

The availability of land will put a challenge in many countries if landfills practice is continued and restrictions on this are being imposed to stop the use of plastic bags.(Horton 2022)

The plastic bags which are made so thin of 20 microns thick film are choking the drains of many places, this causes un controlled floods during rainy season as the sewage system gets blocked. Furthermore, the plastic bag in garbage are estimated killing a million creatures in sea every day. The plastic bags littering has led to banned use of thin plastic bags by the consumer industry during retail and sale of products.(Bailey 2022)

Globally there was an extensive use of plastic bag in industrialized world but now the European parliament has put a ban on single use plastic bag across the Europe. This ban includes plastic bags, plates, straws and other products. Around 80 million tons of plastic end up in ocean at a rate of a dump truck every minute. A member of the European Parliament from Belgium, Frederique Rise, helped craft the bill and called the EU ban on single-use plastic "a victory for our oceans, for the environment and for future generations.(Sheridan, Fonvielle et al. 2022)

Regionally, the widely used single-use plastic bag is a major source of non-degradable solid waste across South Asia. In the absence of proper management, plastic waste pollutes the soil, and gets deposited in water sources. (Jehangir, Imtiaz et al. 2022)It reduces the scenic beauty of the landscape and clogs drainage, which might result in urban flooding. When plastic is burnt, it pollutes the air and, when buried in a landfill site, it remains for a long time. Realizing the potential negative impacts of plastic bags, many countries are using command and control as well as market-based approaches to reduce their usage.(Williams and Rangel-Buitrago 2022)

The literature suggest that the effectiveness of these various interventions are situation specific and depend very much on how they are implemented, despite a ban on the production, distribution and usage of plastic bags in Bangladesh and parts of India, violations of these regulations are common. Plastic bag charges and bans are not uniformly positive. The plastic bag bans affect consumer behavior on reducing the use of such bags, it has some negative implications like job losses, the substitution costs and increased use of reusable plastic bags. (Afrin, Rahman et al. 2022)

Moreover, in Nepal, plastic bags have been identified as a cheap and convenient replacement for paper bags since the early 1990s. Retailers do not charge separately for plastic bags, thus discouraging consumers from carrying their own bags. As a result, the contribution of plastics to Nepal's solid waste stream is increasing. The government of Nepal started to regulate the use of plastic bags by enforcing the Plastic Bag Reduction and Regulation Directive. This Directive restricts both the use and the production of plastic bags that are less than 20 microns thick. At

the local level, several municipalities have also been regulating the use of plastics bags, using a variety of approaches for the past few years. (Khanal 2022)

The authorities are implementing a partial ban based on color and thickness. However, the effectiveness of the bans varies significantly across the municipalities. The results of the study indicate that a strict enforcement of a complete ban on plastic bag use will reduce the number of plastic bags used by consumers by around 95% and the weight of plastic bags used by retailers by almost 100% as compared to a poorly enforced complete ban, a partial ban, or no ban.(Arriagada, Lagos et al. 2022)

Despite broad public sentiment that plastic is harmful to the environment, it is proving hard for the global economy to quit producing new plastic products. Unlike other ecologically friendly practices, attempts to eliminate plastics have not been directly helpful to the bottom line of many consumer companies. S&P Global Ratings forecast that plastic packaging is unlikely to be replaced in the near future for many of its current uses, as plastic holds advantages over some alternative packaging options like paper or glass. Changes to plastic production are more likely, including a possible increase in the amount of recycled plastic over time.(Bailey 2022)

In Pakistan, there is an excessive consumption of plastic bags usage and people are used for the single use plastic bags. In last decade the use of plastic bags has fueled the plastic pollution leading to considerable adverse consequences for human health and environment. To control the wide use of plastic bags, the government puts ban on single use plastic bags in Islamabad and other big cities on August 2019, but got no significant output from the public. However, if we look into the situation of big cities like Lahore and Karachi, the public is still addicted to use plastic bags and as a consequence there is urban flooding and choking of pipes.(Tamoor, Samak et al. 2022) Because of this, incidence of Malaria is so much raised in peak season that effects population as the plastic bags gives mosquitos a plat form for nourishment.(Ashraf Hussain, Chaudhary et al. 2022)

It is very unfortunate that, although plastic bags have been seen to have reduced agricultural production worldwide, there has been little significant awareness-raising to undertake proper, effective and concrete proactive action. Indeed, few serious scientific investigations have been made by international organizations and the international community to reduce the ever-increasing consumption of plastic bags.(Khan, Siddiqi et al. 2022)

Plastic bags should be prohibited globally and their biodegradable equivalent should be implemented to address these gross and harmful issues.

1.1 Rationale

Unfortunately, plastics account for **65 per cent of the total waste in Pakistan**; 55bn plastic bags are being used in the country with an expected annual increase. The adverse use of plastic bags followed by unfavorable discard methods is causing serious harm to human life, marine life and the ecosystem. On the other side, after campaigns on consequences of plastic bags and legislations by Government, many brands and marts are using paper or cloth bags for retail purposes in Pakistan but they use to charge it from public, because of this the public use to deny buying bags and they prefer using plastic bags. This study aimed to find out the association of plastic bags ban with customer opinions on use of environmental friendly bags so that this trigger of environmental pollution could be reduced. (Ashraf Hussain, Chaudhary et al. 2022)

1.2 Objectives

1. To find out the prevalence of plastic bags use among general population of Islamabad.
2. To find out the prevalence of environmental friendly bags use among general public of Islamabad.
3. To find out the association of plastic bags ban with use of environmental friendly bags among general population of Islamabad.

CHAPTER II: LITERATURE REVIEW

The plastic bags pollution has many drastic effects around the globe, every year around 500 billion plastic bags are used worldwide, So many that over one million bags are being used every minute and they're damaging our environment. Big numbers can be daunting. Every man, woman and child on our planet uses around 83 plastic bags every year. That's one bag per person every four and half days. Of those 500 billion bags, 100 billion are consumed in the United States alone.(Penn, Bastola et al. 2022)

2.1 Pollution and Public opinion on plastic bags usage

The general public uses too much plastic bags and the situation is alarming. A literature shows that majority of population have considered plastic waste serious and recommended ways to reduce it. A study concluded in USA suggests that annually, a large number of used plastic shopping bags are released into the environment, posing significant threats to public health and wildlife.(Yalwaji, John-Nwagwu et al. 2022) Owing to these concerns, many local, regional, and national governments around the world have passed legislation to ban or restrict the use of plastic shopping bags. However, in the USA there are only 18 states that have approved plastic bag bans/fees, and even within these states these regulations do not cover all cities or counties. The general public responded that use of plastic bags by them is convenient and cheap, if the retailers provide other replaceable free of cost then they can minimize use of plastic bags.(Borg, Lennox et al. 2022)

2.2 Plastic pollution and urban flooding

The Urban floods are entirely manmade with poorly maintained drains, plastic bags, shrinking open spaces and climate change contributing to accumulation of water on roads after a heavy downpour. The study concluded in Pakistan suggested that General public's buying capacity increases the problems for city's sanitary staff, evidenced by the poor waste collection facilities.(Ashraf Hussain, Chaudhary et al. 2022) There is one sanitary cleaner for 900 people, and as the drainage network of Gujrat is poorly constructed, this number is not justifiable. The vehicles which government has provided for solid waste management and drains cleaning are not efficient. Lack of social acceptability of sanitary workers discourages them and they do not perform their duty efficiently. People do not want to be recruited in TMA department because of the low wages and overburdening of work. This research has proved the inability of TMA Gujrat in the department of SWM. Despite being the only responsible authority for SWM, it does not have a strategy to properly dispose the city's waste and keep the drains free from waste

accumulation.(Ahmed, Padda et al. 2023) The drainage system is not covering 40% residential area which makes the whole system more problematic. This study concludes that installation of new waste dumping sites and sewerage facilities is unavoidable. Furthermore the excessive use of plastic bags and they are discarded by individuals add to the issue of urban flooding.(Ahmad Kaker and Anwar 2022)

2.3 Environmental impacts of plastic bags usage

Plastic bag is causing irreparable damage to the environment especially to the agriculture all over the world. The environment including its soil, water and air is seriously affected by the use of plastic bags. Plastic bags are manufactured with fossil fuel which emits toxic gas which has become detrimental to the various life forms in the planet. Inconsiderate disposal of plastic bags after use and lack of proper management in non-industrial countries are also causing trouble to the environment.(Gómez and Escobar 2022) The disposal of plastic bags clog drain pipes, thus contributing to massive floods which have already cost thousands of lives and billions of dollars lost just to repair the damage and restore the public infrastructural facilities. Plastic bags are also problematical to the livelihoods of local people and national governments, both in terms of the loss of agricultural potentials and negative impacts on the tourism industry, in addition to the high cost of cleaning up process which falls on the local and national governments.(Khan, Haq et al. 2022)

2.4 Plastic bags and danger to sea life

The research shows that Pollution has become a major environmental concern in recent years. An environmentally friendly atmosphere is critical for a healthy society. Plastic garbage is dumped directly into the environment by various industries, including automotive, textiles, power plants, and many more. (Nikiema and Asiedu 2022)These plastic/synthetic wastes emit various toxic gases into the environment, posing a serious threat to humankind. As a result of this environmental influence, many airborne infections have emerged and pose a health risk. Life cycle assessment is especially crucial for analyzing the recycling process of plastic waste. As a concern marine life is badly affected as this waste including plastic bags is ultimately thrown in to the sea, which become the source of death for water life. The literature shows that if plastic bags are accidently eaten by fish or other aquatic animals take bag may take its life. Furthermore, the life cycle of many aquatic animals are also getting disturbed and many specie came to extinct. This situation is alarming as reported by environmental scientists.(Amena 2022)

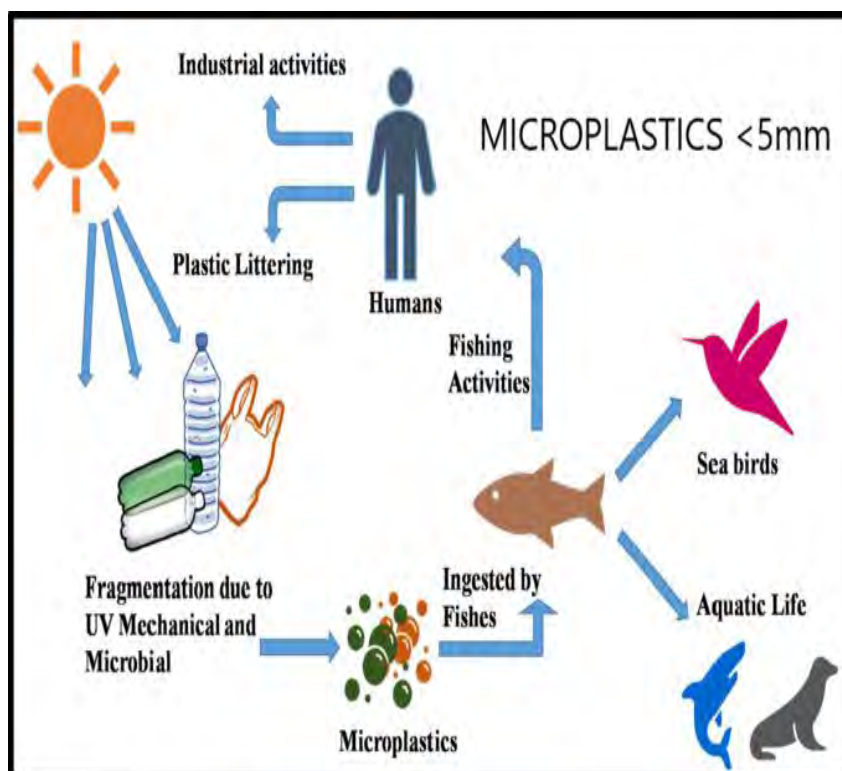


Figure 1 Effects of micro plastics in Aquatic eco system(La Daana, Asmath et al. 2022)

2.5 Pollution taxes and bans

Plastic products are used for a variety of services and are then dumped into the earth after use. These dumped plastics affect our health, socioeconomic conditions, coastal and marine environments, as well as our climate. A study shows the potential opportunities and challenges of plastic products under the umbrella of banning and taxing. The discourse analysis approach was used in this study to critically analyze and summarize 42 relevant studies. The study developed two different storylines. The first storyline used taxing plastic products as an alternative strategy.(Monast and Virdin 2022) The second storyline used banning plastic products as an opposing alternative strategy. The findings of the study show that taxing plastic products is frequently observed in developed countries, whereas banning plastic products is frequently observed in developing countries. Benefits in regards to revenue generation, creating public awareness, employment opportunities, industrial processes, construction processes, and recycling growth are highlighted under the taxing policy. (Lim 2022)On the other hand, a cleaner environment, tourism attraction, eco-friendly shopping, and a reduced ecological footprint are highlighted under the banning policy.in developed countries there are less to no economic crises and a proper municipal services exist there so people are willing to reduce use of plastic bags and also willing to pay the carbon tax, however the situation is worst in developing and under

developed countries. Population of these countries use plastic bags as they as cheap otherwise they have to pay for the alternative bags like fiber bags, paper bags and biodegradable bags. Similarly, they are not willing to pay the tax because of economic crises and the environmental pollution is more a threat in these countries including Pakistan. However, Governments and policymakers play a critical role in developing and implementing the necessary legislative framework for dealing with plastic products and their proper disposal.(Aldieri, Makkonen et al. 2022)

2.6 People; using ecofriendly bags

The rapid growth of employing single-use plastic delivery bags (SPDBs) as express delivery packaging has led to serious resource depletion and environmental pollution. To mitigate these environmental threats, reusable plastic delivery boxes (RPDBs) were developed as an alternative option. This study utilized the life cycle assessment method to compare the environmental impacts of RPDBs and SPDBs.(Zaman, Iftikhar et al. 2022) The results indicated that RPDBs cause fewer environmental impacts than SPDBs during intra-city delivery but higher impacts during inter-city delivery. Greenhouse gas emissions from plastic production were found to be the largest impact contributor, mainly from fossil energy generation during primary plastic pelleting. Increasing the average number of reuse cycles of RPDBs to 50, by 2025, would generate 6.24 million kg CO₂-eq but could reduce CO₂-eq emissions by 309.3 million kg and tons of plastic wastes by 0.96 million, compared to using SPDBs.(Moresco, Charatzidou et al. 2022)

2.7 Plastic bags and public health

Plastic, one of the most preferred materials in today's industrial world is posing serious threat to environment and consumer's health in many direct and indirect ways. Exposure to harmful chemicals during manufacturing, leaching in the stored food items while using plastic packages or chewing of plastic tethers and toys by children are linked with severe adverse health outcomes such as cancers, birth defects, impaired immunity, endocrine disruption, developmental and reproductive effects etc. Promotion of plastics substitutes and safe disposal of plastic waste requires urgent and definitive action to take care of this potential health hazard in future(Metcalf, Oliver et al. 2022). Humans are exposed to a large variety of toxic chemicals and micro plastics through inhalation, ingestion, and direct skin contact, all along the plastic lifecycle. According to WWF, an average person could be ingesting approximately 5 grams of plastic every week. While the health impacts of plastics is still a rather new research area, scientific results to-date

do indicate that the toxic chemical additives and pollutants found in plastics threaten human health on a global scale. Scientifically-proven health effects include causing cancer or changing hormone activity (known as endocrine disruption), which can lead to reproductive, growth, and cognitive impairment. Many of the toxic chemical additives have several other known health impacts, persist in the environment, and bio accumulate in exposed organisms. Research also revealed that micro plastics can harm our health, and act as vessels for pathogens to enter our system, increasing the spread of diseases.

Health impacts are also observed all along the plastic value chain. Examples include pollution at extraction sites, workers exposure to chemicals, air pollution from waste incineration, and water and soil contamination. Vulnerable groups, including children, workers in the informal waste sector and marginalized communities are particularly exposed, thus raising concerns of human rights and environmental injustice. Finally, plastics contribute to the numerous health risks associated with warming temperatures and extreme weather events due to climate change.

2.8 Beating plastic pollution, REDUCE, REUSE, RECYCLE

If we get this right – if we win the battle against plastic pollution – it will not only be a tangible victory for people and planet, but a clear example of how the United Nations is relevant to the lives of citizens around the world.

MARÍA FERNANDA ESPINOSA GARCÉS, PRESIDENT OF THE GENERAL ASSEMBLY

With the advent of plastic revolutionized every aspect of human existence, there is the use of plastic. The surge in use of plastic bags and single use of plastic bags led to global environmental catastrophe. About 12 million plastic is being swept in oceans to make the islands as Islands of Plastic.(Krantz 2022)

The National Action Plan on Plastic Waste Management is prepared based on a preventative approach and using 3R (Reduce, Reuse and Recycle) related waste hierarchy. This approach is in line with the national policies of the government based on the policy statement, “Vistas of Prosperity”,(Bui, Tseng et al. 2022) as well as the view (as stated in “Sustainable

Environmental Policy”) that “The linear economy in which manufacturers produce goods using the existing raw materials and dispose of waste into the environment will be replaced with the circular economy in which waste in one industry can be used as raw material in another (Re-Use, Recycle, Re-Purpose). This will create eco-industrial zones and pave the way for a green economy”(Scells, Zhuang et al. 2022)

2.9.1 Operational definitions

2.9.1 Plastic bags

A plastic bag, poly bag, or pouch is a type of container made of thin, flexible, plastic film, nonwoven fabric, or plastic textile. Plastic bags are used for containing and transporting goods such as foods and other products.

2.9.1 Opinions

An opinion is a judgment, viewpoint, or statement that is not conclusive, rather than facts, which are true statements assessed by asking relevant questions by participants.

2.9.3 Plastic pollution and environment

Plastic pollution is considered to be plastic that is discarded, disposed of, or abandoned in the environment. In an environmental context, plastics are often categorized by size, with macro plastics being larger than 5 millimeters (mm) and micro plastics being less than or equal to 5 mm.

2.9.4 Biodegradable bags

Biodegradable are often still plastic bags that have microorganisms added to break down the plastic.

2.9.5 Environmental friendly

Environmental friendly products or services are those which do not harm environment in on or other way.

CHAPTER III: METHODOLOGY

3.1 Study design and duration

A quantitative research approach using cross-sectional study design was used for the current study. Study period for the current research was six months from September 2022 to March 2023.

3.2 Study setting

The study was conducted by adapted questionnaires by non-probability random sampling and markaz were selected by simple random sampling. The data was collected from G9, G10, G11, F10 and F11 Markaz in Islamabad, the capital of Pakistan.

3.3 Study participants

The general public including retailors and customers in the study setting were the participants of this study.

3.4. Objectives

1. To find out the prevalence of plastic bags use among general population of Islamabad.
2. To find out the prevalence of environmental friendly bags use among general public of Islamabad.
3. To find out the association of plastic bags ban with use of environmental friendly bags among general population of Islamabad.

3.4.1 Inclusion criteria

- All of the retailors and customers present at the time of Data collection.
- All those who are physically and mentally fit.

3.4.2 Exclusion criteria

- All those who are not willing to participate.
- Those having language barrier were excluded from study.

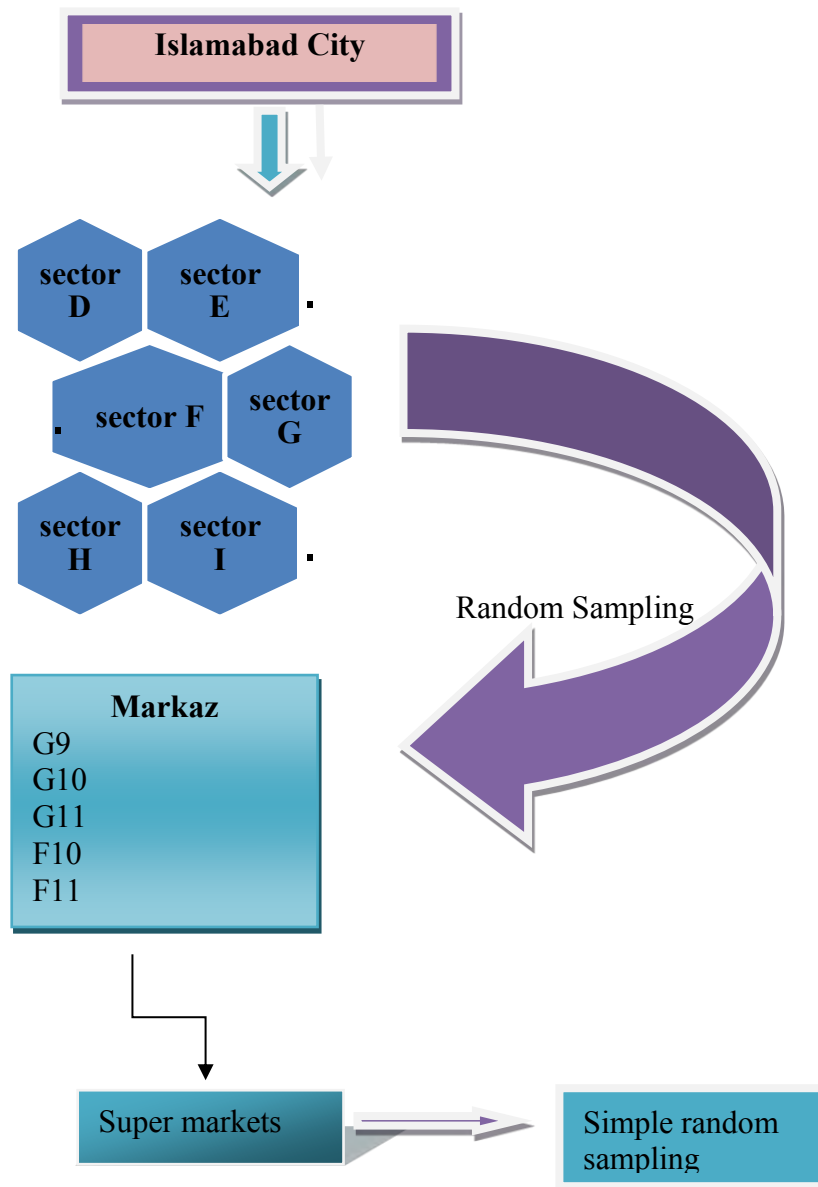
3.5 Sample size calculation

Sample size was calculated using Cochran's formula.(Jehangir, Imtiaz et al. 2022)

$N = z^2 p q / e^2$	
69% prevalence	Z=1.96 at 95% CI
e=5%	
Sample size (N)=328±5%	

A total of 328 individuals participated in the study.

3.6 Sampling strategy



The sample size was calculated using simple random sampling technique. Islamabad, the capital of Pakistan consists of sectors D, E, F, G, H, I. Among these sectors G9,G10,G11,F10,F11 markaz were selected by lottery method and data was collected by simple random sampling from super markets.

3.7 Study variable

Independent variables  Customer's opinion on Plastic bags use
Dependent variables  Environmental friendly methods

3.8 Data collection instrument

An adapted questionnaire was administered to the study population. Data was collected after briefing individuals about the study from selected individuals. The first section of the questionnaire included socio demographic factors. The second section contained environmental effects and opinion of customers about alternative methods. The third section included frequency of usage of plastic bags by different professionals.

3.9 Pilot testing

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Performa was tested for future changes; no major changes were done after pilot testing.

3.10 Reliability and validity

The Cronbach's alpha of the questionnaire is 0.7, while the validity was assessed by pilot testing i.e. the questionnaire was pre-tested for its completeness and correctness before the final data collection process.

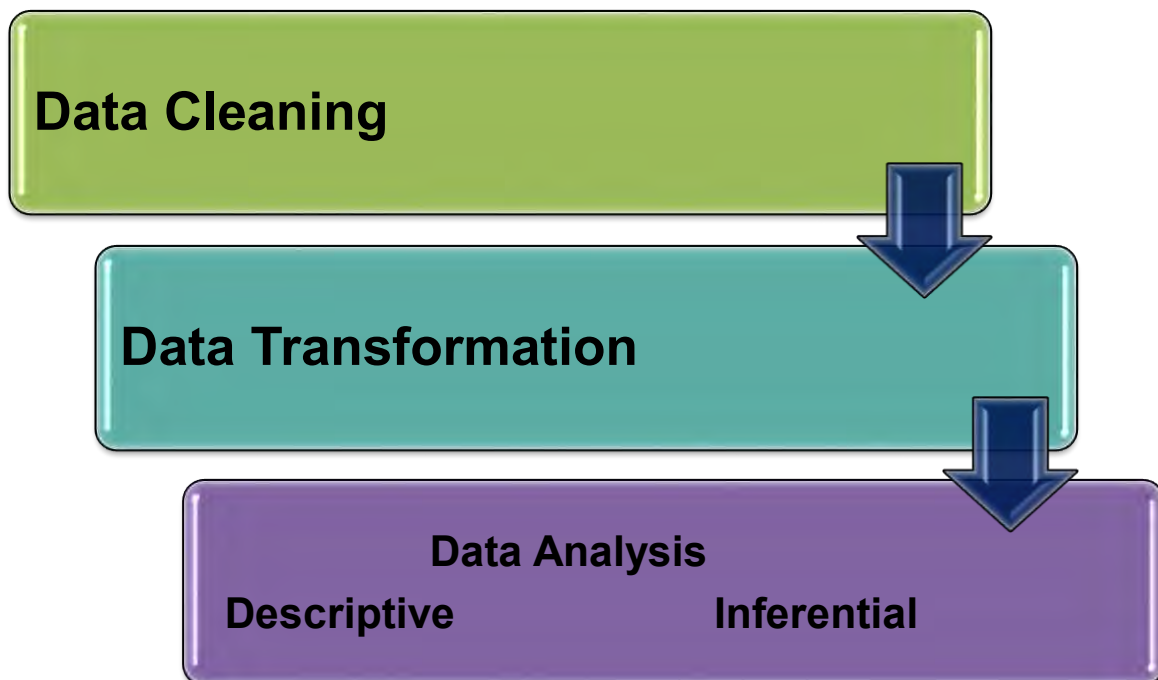
3.11 Data collection procedure

After carrying out a pilot study from relative small sample of the same population which was 10% (N=34) of the total sample size, and adjusted for the changes required in data collection procedure, data collection was done by first asking the permission of the sampled population and then the permission of the respondents satisfying the inclusion norms. An informed consent was taken from all participants.

Once all questionnaires were filled by the participants, the data was then safely secured for further analysis and interpretation.

3.11.1 Data analysis procedure

Data was collected by using adapted questionnaires .It was checked for accuracy and completeness, coded and entered to SPSS version 22.0 for further statistical analysis. All errors and discrepancies were eliminated to clean the data by running frequencies and tabulation. The results of categorical variables were expressed as frequencies and percentages. The Chi square test was used to assess univariate associations between sociodemographic variables and opinions on plastic bags ban and using environment friendly bags. The p-value of <0.05 was considered significant.



3.12 Ethical consideration

Ethical approval was sought from the ethical review committee of Pakistan institute of ophthalmology, Al-Shifa school of public health prior to the commencement of this study. A formal letter from the ethical review committee was used to get permission from administration of sampled population.

Confidentiality and anonymity was maintained after gaining informed consent of the participants. Personal identification data was not collected. All participants had the right to withdraw from the study at any time. Participants were given basic information on the purpose of the study, data required for this research, and how their data will be used. The data access was given only to authorized personals.

CHAPTER IV: RESULTS

4.1 Sociodemographic profile of respondents

In this study 328 respondents were included among them 58% were males and 24% of respondents were 18 to 22 years old, 41% were in the age group of 23 to 27 years, 25% were of age 28 to 32 years and around 8 % were of 33 years and above. Among respondents 53% were married and 41% were unmarried. Seventeen percent of the respondents get income less than 20,000, 70 % earn between 20,000 to 40,000, around 18 % earn around 50,000. The most prevalent among respondents were retailers contributing to (136)41% of the sample size. 7% were students, around (59)17 % were government employes and 33% belonged to other professions. Among respondents 72% did matric, 15 % had intermediate education, and only 4.5% studied up to graduation. Among respondents 82% visit market daily, 10% visit 3 to 5 times a week, around 3.9 % visit once per month. The reason which participants give about the use of plastic bags were that cheap bags responded by 46% of the sampled population, 33% said that it is easily available and 19% said that there is lack of alternatives to plastic bags. Fifty five percent of respondents use more than 10 bags a week while 39 % use less than 10 bags a week. Around 49% respondents reported that they will stop using plastic bags if alternatives would be available. About the frequency of usage of plastic bags for domestic waste 60% reported that they use more than 10 bags a week and 56% of them use less than 5 bags per day.

Table 1 Socio demographic profile of respondents

Variables		Total n (%)
Gender	1. Male 2. Female	192(58.2) 136(41.2)
Age	1. 18 to 22 years 2. 23 to 27 years 3. 28 to 32 years 4. 33 years and above	81(24.5) 136(41.2) 83(25.2) 28(8.5)
Marital status	1. Married 2. Unmarried 3. Widow/divorced	176(53.3) 138(41.8) 14(4.2)
Monthly income	1. <20,000 2. 20,000 to 40,000 3. 41,000 to 50,000 4. >51,000	17(5.2) 232(70.3) 62(18.8) 17(5.2)
Occupation	1. Students 2. Govt employees 3. Retailor 4. Others(housewife, servants etc)	23(7.0) 59(17.9) 136(41.2) 110(33.3)
Educational status	1. Do not read and write 2. Matric 3. Higher secondary 4. Graduation and above	25(7.6) 238(72.1) 50(15.2) 15(4.5)
No. of plastic bags / person usage/week	1. Less than 5 bags 2. 5-10 bags 3. >10 bags	34(10.3) 112(33.9) 182(55.2)
Intention to use plastic bags	1. Continue to use 2. Stop if alternatives available	64(49.7) 164(49.7)
Frequency of disposing house waste in plastic bags	1. <10 bags a week 2. >10 bags	129(39.1) 199(60.3)
Frequency to reuse plastic bags	1. <5 times 2. >5times	215(65.2) 113(34.2)

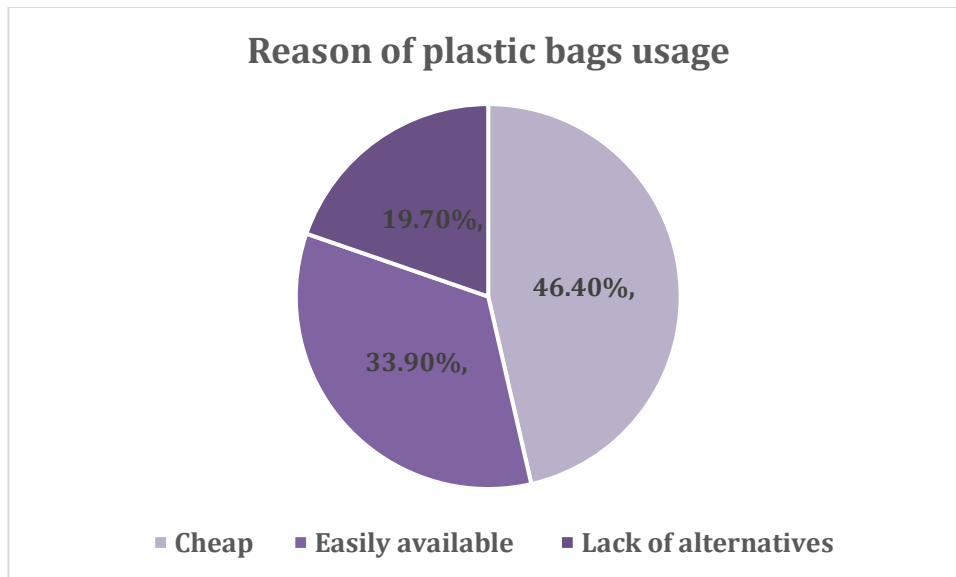


Figure 2 Reason of plastic bags usage

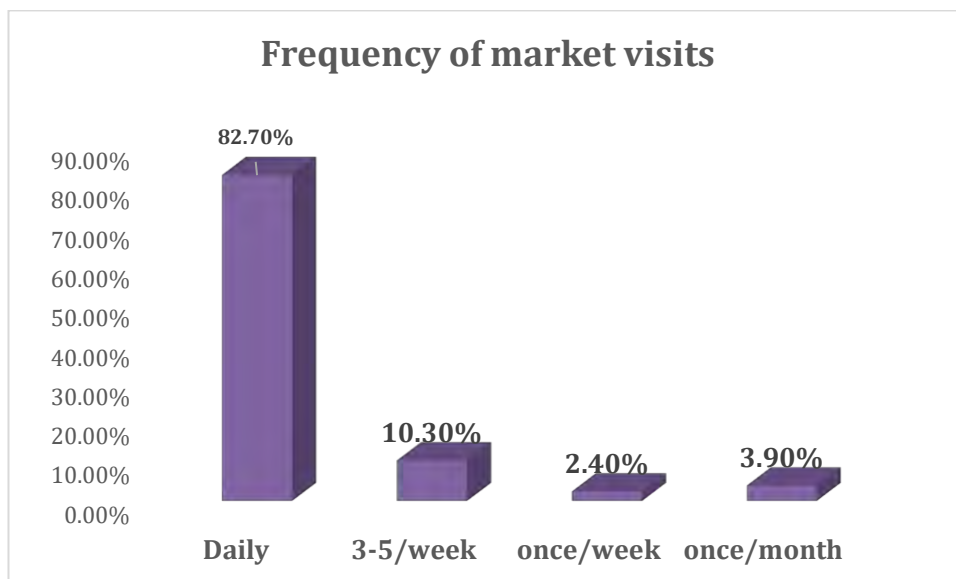


Figure 3 Frequency of market visits by respondents

4.2 Frequency and percentage of Environmental impacts of plastic bags

The results depicts that around 66.7% of respondents knew about environmental impacts due to plastic waste. Around 48% responded that their source of information was television/radio, 33.9% responded that they get information by poster on roads, 13% responded that they got to know about environmental impacts by published material. Sixty six percent responded that plastic bags which are not properly disposed of blocks sewage system, 13% said that it kills

animals if accidentally eaten by them, 12 % said that it causes human health issues and around 7% said that it deteriorates environment.

Around 55.8% responded that they use and throw the plastic bags, 19.7 % reuse them and 23.9 % use them for waste collection. Among respondents 59.4% responded that they do not support efforts to reduce single use plastic bags and 46.7% responded that they

They do not support ban on single use plastic bag. Around 72% of the respondents reported that they are not willing to pay for alternative bags.

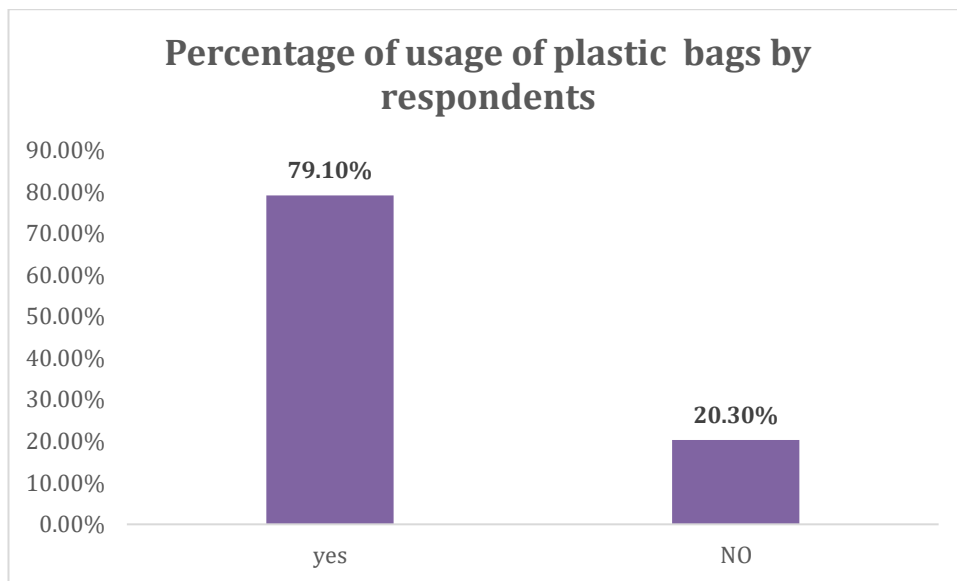


Figure 4 Usage of plastic bags by Respondents

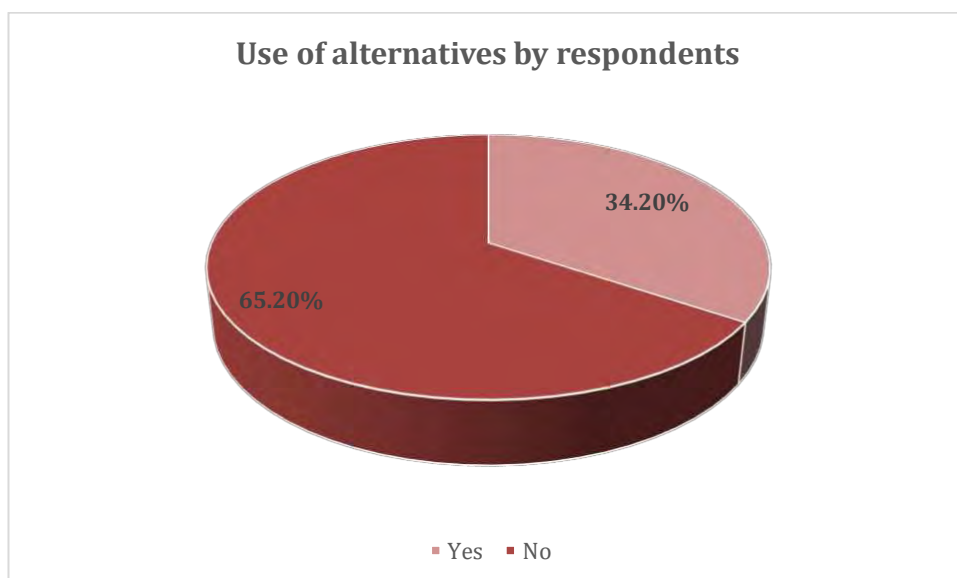


Figure 5 Use of ecofriendly bags by respondents

Table 2 Frequency and percentage of environmental impacts of plastic bags

Variables	Total n(%)
Do you know Environmental impacts	1. Yes 2. No 108(32.7) 220(66.7)
Source of information	1. Tv/radio 2. Posters 3. Published material 4. Other sources 161(48.8) 112(33.9) 45(13.6) 10(3.0)
Disposal methods	1. Use and throw 2. Reuse 3. Waste collection 184(55.8) 65(19.7) 79(23.9)
Support efforts to reduce single use plastic bags	1. Yes 2. No 132(40) 196(59.4)
Support ban on single use plastic bags	1. Yes 2. No 174(52.7) 154(46.7)
Willing to pay for alternative bags	1. Yes 2. No 88(26.7) 240(72.7)
Alternatives you suggest	1. Paper bags 2. Fiber bags 3. Cloth bags 4. Other durables 198(60) 65(19.7) 55(16.7) 10(3)
Community perception towards disposal method	1. Wrapping of waste 2. Open dumping 3. Burning 4. Burying 5. Recycling 52(15.8) 127(38.5) 70(21.2) 41(12.4) 38(11.5)
Aware of campaign to reduce plastic bags	1. Yes 2. No 212(64.6) 116(36.4)

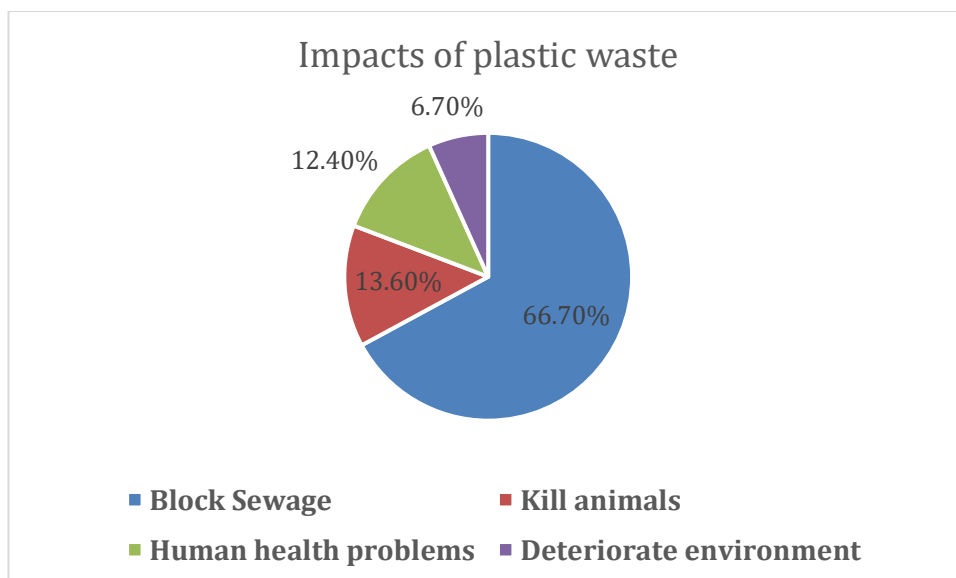


Figure 6 Impacts of Plastic waste

4.3 Frequency and percentage of use of plastic bags by respondents

This table shows the frequency and percentage of plastic bags usage by different professionals. Among students 51.8% use more than 10 bags a week. Among government employs 50 % use more than 10 bags a week. Among retailers 92% use more than 10 bags a week, this is the highest ratio of bags used by retailers and a point of concern for authorities regarding policy making and bans on use of plastic bags.

Table 3 Frequency and percentage of consumption of plastic bags by respondents

Variables		Total n(%)
Students	1. <10 bags /week	171(51.8)
	2. >10 bags/week	157(47.6)
Government employs	1. <10 bags/week	161(48.8)
	2. >10 bags/week	167(50.6)
Retailor	1. <10bags/week	22(6.7)
	2. >10 bags/week	306(92.7)
Others (house wife, servants etc)	1. <10 bags/week	284(86.1)
	2. >10 bags/week	44(13.3)

INFERENCE STATISTICS

Table 4 Association of plastic bags usage with environmental friendly methods

Variable	Category	Plastic bags usage		Chi square(df)	p-value
		Yes	No		
Effects environment by	1. Block sewage	188	32	20.6(3)	0.001
	2. Kill animals	27	18		
	3. Human health issue	27	14		
	4. Deteriorate natural environment	19	3		
Reduce single use	1. Yes	107	154	0.30(1)	0.58
	2. No	25	42		
Use alternative bags	1. Yes	98	163	5.42(1)	0.02
	2. No	15	52		
What alternative preferred	1. Paper bags	145	53	15.6(3)	0.001
	2. Fiber bags	61	4		
	3. Cloth bags	48	7		
	4. Other durables	7	3		
Pay for alternatives	1. Yes	82	179	13.7(1)	0.001
	2. No	6	61		
Disposal methods of plastic bags	1. Wrapping waste	41	11	14.2(4)	0.07
	2. Open dumping	107	20		
	3. Burning	49	21		
	4. Burying	28	13		
	5. Recycling	36	2		

*p-value of <0.05 is significant

4.4 Association of plastic bags usage with ecofriendly methods

Chi square test of independence was applied after checking the assumptions of normality of data. The association was checked between the usages of plastic bags with other alternatives (ecofriendly methods) used instead of plastic bags by respondents.

The data showed significant association with effects of plastic bags on environment with Chi square=20.6(3), p-value=0.001 which means that use of plastic bags and their wastage badly harms the environment by blacking sewage, being the reason of animal health , causing human

health issues and damaging the beauty of nature. Results depicts the significant association of alternatives used by respondents means that public use alternatives if they get them on cheap rates and if the alternatives are easily available with Chi square=15.6(3), p-value=0.001 and there is also a significant association about the willingness of respondents to use alternatives that if they get the ecofriendly options easily they will reduce the use of plastic bags accordingly with Chi square=13.7(1), p-value=0.001.

There is a nonsignificant association of plastic bags use with disposal methods and practice on single use of plastic bags by respondents which means that respondents use plastic bags one and discard it afterwards and they don't know the disposal methods which might not be harming environment so bad with a **p-value <0.05**.

CHAPTER V DISCUSSION

Environment is considered vital for health as it is holistically related to an individual. In the contemporary world, there is a sea of plastic waste pollution which is directly or indirectly affecting health of individuals around the globe. From the last many year's efforts has been made by developed countries to minimize the use of plastic bags to reduce pollution but the developing and under developed countries are lacking this serious concern. The usage of plastic bags has become a significant environmental concern worldwide due to their non-biodegradable nature and the pollution they cause. The general public has an important role to play in reducing plastic bag usage and adopting more environmentally friendly alternatives.

The present study depicts that most of the participants who were using plastic bags were retailers around 41% and they use it because of cheap rates and easily availability. As compared to the study conducted in USA, the use of plastic bags has minimized by 36% by the collaboration of public and government, as an alternative they use eco-friendly bags or paper bags for grocery and daily stuff. The environmental impact of plastic bags is a growing concern in America, and many individuals and organizations are working to reduce plastic bag usage and promote more sustainable alternatives. The impact of plastic bags on the environment includes pollution, harm to wildlife, and contribution to greenhouse gas emissions. (Xanthos and Walker 2017)

The present study suggests that people who were literate use more plastic bags as they don't know the dangers of using cheap plastic bags, they use it for every little thing to carry and waste it on road creating pollution, A similar study was conducted to check the usage of plastic bags in literate and illiterate population, the results showed that both groups don't throw plastic bags on roads and properly dispose of them if they use plastic bags, otherwise alternatives are used by them. The level of awareness, availability of alternatives, convenience, and government policies may vary between literate and illiterate communities. Addressing these factors and promoting behavior change among both literate and illiterate populations is crucial to reducing plastic pollution and promoting more sustainable alternatives. The reason of this contradiction with our study population was clear that Government of UAE imposes fine on throwing litter around but there is no such fine in Pakistan, making all the surrounding a dump of waste. (Hammami, Mohammed et al. 2017)

Our study suggested that, more visits to market leads to more use of plastic bags as, people do more shopping and use more bags, around 82% of respondents reported that they visit market daily and use plastic bags. another study conducted in Nepal shows the similar results as our

study , the individuals who are daily market users use more shopping bags than non-visitors.(Bharadwaj, Baland et al. 2020)

This study shows that people use more plastic bags as they are cheap, shopkeepers give them for free as many as customer wants. Plastic bags are produced at a low cost, which makes them a popular choice for retailers. However, the production cost does not take into account the environmental and societal costs associated with their usage. And they are convenient to buy. An other study conducted in Nepal suggested that there was a similar situation in Nepal but after a ban on usage of Pakistan the effectiveness of ban was 20% as compared to previous. (Khanal 2022)

This study shows that people throw house waste in plastic bags as more than 10 garbage bags a week, they think that this is the best method of disposing plastic bags instead of burning or burying. A similar study conducted in China suggested that there is proper municipal system to collect house hold waste and individuals are not supposed to through waste in plastic bags. This contributes pretty much in pollution caused by plastic bags use. (Wang, Zhao et al. 2021)

This study suggested that around 66% of population don't know about the environmental impacts of plastic bags, they only know that plastic bags clog the pipes. There is lack of awareness about other hazards like danger to human health, danger to marine life and animal's health and also environmental pollution. Another study suggested that the population of Europe is literate and well aware of hazards of plastic bags poor disposal methods. Plastic bags have significant environmental impacts, including pollution, energy and resource consumption, waste, harm to wildlife, and human health impacts. Reducing plastic bag usage and promoting more sustainable alternatives is crucial in mitigating these impacts and protecting the environment. (Bharadwaj, Baland et al. 2020)

This study suggested that the major source of information used by most of the population is television and radio, so awareness advertisements should be presented on television other than published materials, another study suggested that awareness campaigns are held at community gatherings and published on news or magazines which contradicts our study because of low literacy rate in Pakistan. (Steensgaard, Syberg et al. 2017)

The results show that around 72% of population is not willing to pay for plastic bags, the situation is because of bad economic conditions, the alternative bags are expensive and no facility is being given by government. A similar study conducted in USA suggested that people are willing to buy alternative bags and also government give incentives to retailers who buy paper bags or other biodegradable bags. The lack of alternative bag use among the public because of cost is a common issue. By providing incentives, education, subsidies, and policies, governments

and retailers can encourage the use of alternative bags and reduce the environmental impact of plastic bags. (Ahmed, Padda et al. 2023)

The results of current study shows that 64% responded needed awareness about the environmental hazards of using plastic bags, and the benefits of using environmental friendly bags, the need aware ness about the proper disposal methods also. A similar study conducted in China suggested that people of well aware about how to save the environment which contradicts awareness level of our population.(Borg, Lennox et al. 2022)

There has been a growing awareness about the ban on plastic bags in Pakistan in recent years. In August 2019, the government of Pakistan imposed a complete ban on the manufacturing, sale, and use of non-biodegradable plastic bags in Islamabad, the country's capital. The ban was later extended to other cities, including Lahore and Peshawar.

To raise awareness about the ban and encourage compliance, the government has taken several measures, including:

Public awareness campaigns, The government has launched public awareness campaigns through various media channels, including social media, to educate the public about the environmental impacts of plastic bags and the importance of using alternatives.

Enforcement efforts, the government has enforced the ban by imposing fines on violators, seizing banned plastic bags from markets, and taking legal action against manufacturers and sellers of non-biodegradable plastic bags.

Alternative bag initiatives, the government has also initiated various programs to promote the use of alternative bags, including the distribution of cloth bags and jute bags to the public.

Collaboration with stakeholders, the government has collaborated with stakeholders, including civil society organizations, environmental groups, and retailers, to raise awareness and promote compliance with the ban.

Overall, there has been a growing awareness about the ban on plastic bags in Pakistan, and the government's efforts to enforce the ban and promote alternative bags have helped to increase compliance among the public. However, more work needs to be done to ensure widespread adoption of sustainable alternatives and reduce the environmental impact of plastic bags in Pakistan.

5.1 Strengths

- The current study was an important step towards environmental pollution by excessive use of plastic bags as people in Pakistan do not use ecofriendly bags.
- The study included participants from both genders and from different educational backgrounds, so the current findings can be generalized to similar context.
- The findings of the study helped to fill gaps in literature regarding perception on plastic bags ban and using environmental friendly bags.

5.2 Limitations

- It was a cross sectional study, which limits the establishment of causal relationship.
- Information bias may be another limitation.
- Time limitation was another issue faced in current study.

CONCLUSION

Majority of the respondents perceives that plastic bags are cheap to use, among respondents open dumping of waste is the most preferred method of disposal of plastic bags, but this is entirely wrong practice as it clogs the pipes and if dumped in landfill remains there for 100 years to cause land pollution and ocean of plastic waste. Respondents felt that an increase awareness would support the ban on use of plastic bags and promote use of environmental friendly bags. The Government and Non- Government organizations and the general public should take part in concluding this issue.

RECOMMENDATIONS

Based on the results of our study, following recommendations were made to decrease the use of plastic bags and encourage use of environmental friendly bags.

Firstly, an advertising campaign be implemented to promote the new services to be offered by the government and community representatives, media and social activist to people, particularly women, living in rural areas about the ban of plastic bags and use of paper bags or other biodegradable bags.

Second, an educational campaign be developed and free of cost or at minimum cost bags should be provided by government to retailers for domestic activities or sale purposes.

To successfully implement these recommendations the collaboration between the Government and public is needed. Moreover, the more sophisticated support of the role of community development and minimize use of plastic bags all over Pakistan is needed.

There should be serious efforts to provide free of cost bags, incentives to promote alternative bags usage and punishing others who use plastic for the sake of environmental protection.

REFERENCES

- Afrin, S., et al. (2022). "Is there tea complemented with the appealing flavor of microplastics? A pioneering study on plastic pollution in commercially available tea bags in Bangladesh." *Science of The Total Environment* **837**: 155833.
- Ahmad Kaker, S. and N. Anwar (2022). "From One Flooding Crisis to the Next: Negotiating 'the Maybe' in Unequal Karachi."
- Ahmed, N., et al. (2023). "Climate change adaption strategies in urban communities: new evidence from Islamabad, Pakistan." *Environmental Science and Pollution Research*: 1-14.
- Aldieri, L., et al. (2022). "Do research and development and environmental knowledge spillovers facilitate meeting sustainable development goals for resource efficiency?" *Resources Policy* **76**: 102603.
- Amena, S. (2022). "Utilizing solid plastic wastes in subgrade pavement layers to reduce plastic environmental pollution." *Cleaner Engineering and Technology* **7**: 100438.
- Arriagada, R., et al. (2022). "Exploring consistency between stated and revealed preferences for the plastic bag ban policy in Chile." *Waste Management* **139**: 381-392.
- Ashraf Hussain, D., et al. (2022). "Climate Change And Its Impacts On Pakistan." *Journal of Positive School Psychology* **6**(8): 9195-9217.
- Bailey, I. (2022). "Media coverage, attention cycles and the governance of plastics pollution." *Environmental Policy and Governance* **32**(5): 377-389.
- Bharadwaj, B., et al. (2020). "What makes a ban on plastic bags effective? The case of Nepal." *Environment and Development Economics* **25**(2): 95-114.
- Borg, K., et al. (2022). "Curbing plastic consumption: A review of single-use plastic behaviour change interventions." *Journal of Cleaner Production*: 131077.
- Bui, T.-D., et al. (2022). "Opportunities and challenges for solid waste reuse and recycling in emerging economies: A hybrid analysis." *Resources, Conservation and Recycling* **177**: 105968.
- Ganesan, S., et al. (2022). "Effect of biofilm formation on different types of plastic shopping bags: Structural and physicochemical properties." *Environmental Research* **206**: 112542.
- Gómez, I. D. L. and A. S. Escobar (2022). "The dilemma of plastic bags and their substitutes: A review on LCA studies." *Sustainable Production and Consumption* **30**: 107-116.
- Hammami, M. B. A., et al. (2017). "Survey on awareness and attitudes of secondary school students regarding plastic pollution: implications for environmental education and public health in Sharjah city, UAE." *Environmental Science and Pollution Research* **24**: 20626-20633.

Horton, A. A. (2022). "Plastic pollution: when do we know enough?" *Journal of Hazardous Materials* **422**: 126885.

Jehangir, A., et al. (2022). "Pakistan's plastic bag ban: an analysis of citizens' support and ban effectiveness in Islamabad Capital Territory." *Journal of Material Cycles and Waste Management* **24**(4): 1612-1622.

Joseph, N., et al. (2016). "Usage of plastic bags and health hazards: A study to assess awareness level and perception about legislation among a small population of Mangalore city." *Journal of clinical and diagnostic research: JCDR* **10**(4): LM01.

Khan, R. U., et al. (2022). "Framework for Plastic Waste Management: Assessment of Factors Impacting the Circularity of Plastics." *International Journal of Circular Economy and Waste Management (IJCEWM)* **2**(1): 1-21.

Khan, S. M., et al. (2022). Utilization of three indigenous plant species as alternative to plastic can reduce pollution and bring sustainability in the environment. *Natural Resources Conservation and Advances for Sustainability, Elsevier*: 533-544.

Khanal, A. (2022). Survey on usage of single use plastic bags in Nepal. *IOP Conference Series: Earth and Environmental Science, IOP Publishing*.

Kochanska, E., et al. (2022). "Global Ban on Plastic and What Next? Are Consumers Ready to Replace Plastic with the Second-Generation Bioplastic? Results of the Snowball Sample Consumer Research in China, Western and Eastern Europe, North America and Brazil." *International Journal of Environmental Research and Public Health* **19**(21): 13970.

Krantz, D. (2022). *Climate and Covenant: A Case Study of the Functions, Goals, and Tensions of Faith at the 23rd Conference of Parties to the United Nations Framework Convention on Climate Change. Religious Environmental Activism, Routledge*: 282-302.

La Daana, K. K., et al. (2022). "The status of marine debris/litter and plastic pollution in the Caribbean Large Marine Ecosystem (CLME): 1980–2020." *Environmental Pollution*: 118919.

Lim, W. M. (2022). "The sustainability pyramid: A hierarchical approach to greater sustainability and the United Nations Sustainable Development Goals with implications for marketing theory, practice, and public policy." *Australasian Marketing Journal* **30**(2): 142-150.

Metcalf, R., et al. (2022). "Quantifying the importance of plastic pollution for the dissemination of human pathogens: The challenges of choosing an appropriate 'control' material." *Science of The Total Environment* **810**: 152292.

Monast, J. J. and J. Virdin (2022). "Pricing Plastics Pollution: Lessons from Three Decades of Climate Policy." *Conn. L. Rev.* **54**: 345.

Moresco, V., et al. (2022). "Binding, recovery, and infectiousness of enveloped and non-enveloped viruses associated with plastic pollution in surface water." *Environmental Pollution* **308**: 119594.

Nikiema, J. and Z. Asiedu (2022). "A review of the cost and effectiveness of solutions to address plastic pollution." *Environmental Science and Pollution Research* **29**(17): 24547-24573.

Penn, J., et al. (2022). "Nudging away from plastic bags with charitable donations." *Land Economics* **98**(1): 132-149.

Scells, H., et al. (2022). Reduce, Reuse, Recycle: Green Information Retrieval Research. *Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval*.

Sheridan, E. A., et al. (2022). "Plastic pollution fosters more microbial growth in lakes than natural organic matter." *Nature Communications* **13**(1): 4175.

Steensgaard, I. M., et al. (2017). "From macro-to microplastics-Analysis of EU regulation along the life cycle of plastic bags." *Environmental Pollution* **224**: 289-299.

Tamoor, M., et al. (2022). "Pakistan toward Achieving Net-Zero Emissions: Policy and Roadmap." *ACS Sustainable Chemistry & Engineering*.

Wang, B., et al. (2021). "How do tougher plastics ban policies modify people's usage of plastic bags? A case study in China." *International Journal of Environmental Research and Public Health* **18**(20): 10718.

Williams, A. T. and N. Rangel-Buitrago (2022). "The past, present, and future of plastic pollution." *Marine Pollution Bulletin* **176**: 113429.

Xanthos, D. and T. R. Walker (2017). "International policies to reduce plastic marine pollution from single-use plastics (plastic bags and microbeads): A review." *Marine Pollution Bulletin* **118**(1-2): 17-26.

Yalwaji, B., et al. (2022). "Plastic pollution in the environment in Nigeria: A rapid systematic review of the sources, distribution, research gaps and policy needs." *Scientific African*: e01220.

Zaman, K., et al. (2022). "Embracing biodegradable bags: Effects of ethical self-identity on consumer buying behavior." *Social Responsibility Journal*.

Annexure –A Questionnaire

Customer's opinion on usage of plastic bags with environmental friendly bags among general public of Islamabad

SECTION 1

1. Age

- a) Less than 20 years
- b) 21 to 30 years
- c) 31 to 40 years
- d) 41 years and above

2. Gender

- a) Male
- b) female

3. Marital status

- a) Married
- b) Unmarried
- c) Divorced
- d) Widow

4. Monthly income

- a) Less than 20,000
- b) 20,000 to 40,000
- c) 41,000 to 50,000
- d) > than 51,000

5. Occupation

- a) Student
- b) Government employ
- c) Retailor
- d) others

6. Educational status

- a) Do not read and write
- b) Matric
- c) Higher secondary
- d) Graduation and above

7. Market visits?

- a) Daily
- b) 3-5 times per week
- c) Once a Week
- d) Once per month

8. Do you use plastic bags?

- a) Yes
- b) No

9. Reason for use of plastic bag?

- a) Cheap

- b) Easily available
 - c) Lack of alternatives
 - d) Light and convenient
- 10. Number of plastic bag use per person per week**
- a) Less than 5 bags
 - b) 5-10 bags
 - c) More than 10 bags
- 11. Intention on use of plastic bags?**
- a) Continue to use
 - b) Stop if alternatives are available
- 12. Frequency of disposing house waste in plastic bags?**
- a) Less than 10 bags a week
 - b) More than 10 bags a week
- 13. Frequency of reusing plastic bags?**
- a) Less than 5 times
 - b) More than 5 times

SECTION 2

- 14. Do you know the environmental impacts of plastic bags?**
- a) Yes
 - b) No
- 15. From where you get information about plastic bags disposal?**
- a) TV/Radio
 - b) School
 - c) Professionals/published materials
 - d) Other sources
- 16. What environmental impacts do you know?**
- a) Block sewage system
 - b) Kill animals if accidentally eaten
 - c) Human health problems
 - d) Deteriorates the natural beauty of the environment
- 17. What disposal methods do you use for plastic bags?**
- a) Use and throw away
 - b) Reuse for different purposes
 - c) Waste collection and dumping
- 18. Do you support efforts to reduce single use plastic bags?**
- a) Yes
 - b) No
- 19. Do you support a ban on single use plastic bags?**
- a) Yes
 - b) No
- 20. Do you use alternative bags?**
- a) Yes
 - b) No
- 21. Are you willing to pay for alternative shopping bags?**
- a) Yes

- b) No
- 22. What alternatives do you suggest for plastic bags?**
 - a) Paper bags
 - b) Fiber bags
 - c) Cloth bags
 - d) Other durables
- 23. Community's perception toward disposal method of plastic bag?**
 - a) Wrapping of waste
 - b) Open dumping
 - c) Burning
 - d) Burying
 - e) Recycling
- 24. Are you aware of any campaign to reduce the use of plastic bags in your area?**
 - a) Yes
 - b) No

SECTION 3

Frequency of the Pattern of plastic bags use according to professional categories

- 25. Students**
 - a) Less than 10 bags a week
 - b) More than 10 bags a week
- 26. Government employs**
 - a) Less than 10 bags a week
 - b) More than 10 bags a week
- 27. Retailors**
 - a) Less than 10 bags a week
 - b) More than 10 bags a week
- 28. Others**
 - a) Less than 10 bags a week
 - b) More than 10 bags a week

Annexure b -Consent form

Title of Research:

Customer's opinion on usage of plastic bags with environmental friendly bags among general public of Islamabad.

Researcher Name: Alishba Javed

Purpose of Research:

Mandatory submission in partial fulfillment of the requirement for the Master's degree in Public Health from Quaid e Azam University, Islamabad.

Certificate of Consent:

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Respondent 'signature:

Identification no:

Dated

Statement of Confidentiality

The information provided by you shall be anonymous. Researcher is obliged to preserve your confidentiality in the following way:

- Code numbers will be assigned which would be used on all documents included in study.
- Questionnaires returned shall be kept safe with access only to the principal researcher.
- Virtual data files shall be kept separately in an external hard drive, password protected
- And shall be used for the purpose of study only.
- Any information before withdrawal shall be deemed good for including in the study.
- Following may use the health information provided by you in connection with this study

The principal researcher

Research Supervisor

Institutional Review Board Al-Shifa School of Public Health

Annexure- C IRB Letter



AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/14-30
27th Sep, 2022

TO WHOM IT MAY CONCERN

This is to certify that Alishba Javed D/O Chaudhry Badar Javed is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **“Assessment of customers opinion on plastic bags ban and using environmental friendly bags among general public of Islamabad”**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

Annexure –D Budget

BUDGET ITEM	TRANSPORT	STATIONARY & INTERNET	PRINTING	PUBLISHING
Pilot testing	2000/-	5500/-	4000/-	-
Data collection	10000/-	7500/-	-	-
Thesis write up	3000/-	8500/-	6000/-	20000/-
Total expenditure	15000/-	22500/-	10000/-	20000/-
Grand total	67500/-			

Annexure –E GANTT Chart

Activities	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023
Literature search							
Synopsis writing & IRB approval							
Pilot testing							
Data collection & entry							
Data analysis							
Write up							
Thesis submission							