

A STUDY ON CONSUMER OPINION TOWARDS USE OF HAND SANITIZER DURING COVID-19

Submitted in partial fulfillment of the requirements for the award of

Master of Business Administration

by

M. SANDHANA SILVIYA
Register No. 39410181



SCHOOL OF BUSINESS ADMINISTRATION

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE
Jeppiaar Nagar, RAJIV GANDHI SALAI, CHENNAI - 600 119**

April - 2021



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with "A" grade by NAAC | 12B Status by UGC | Approved by AICTE
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai – 600 119
www.sathyabama.ac.in**

SCHOOL OF BUSINESS ADMINISTRATION

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of Ms. SANDHANA SILVIYA . M (39410181) who have done the Project work entitled , **"A Study On Consumer Opinion Towards Use Of Hand Sanitizer During Covid-19"** under my supervision from December 2020 to February 2021 .

Dr. A. PALANI

Internal Guide

Dr. BHUVANESWARI G.

Dean – School of Business Administration

Submitted for Viva voce Examination held on _____.

Internal Examiner

External Examiner

DECLARATION

I, **M. SANDHANA SILVIYA , (39410181)** hereby declare that the Project Report entitled **“A Study on consumer opinion towards use of hand sanitizers during covid-19”** done by me under the guidance of Dr. A. Palani M.COM ., MBA., M.Phil., Ph.D., at **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY, CHENNAI** is submitted in partial fulfillment of the requirements for the award of Master of Business Administration degree.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my sincere thanks to **Dr. BHUVANESWARI G.**, Dean, School of Business Administration and **Dr. PALANI A.**, Head, School of Business Administration for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide Dr. PALANI A., M.COM ., MBA., M.Phil., Ph.D., for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the School of Business Administration who were helpful in many ways for the completion of the project.

M. SANDHANA SILVIYA

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO
	ABSTRACT	I
	LIST OF TABLES	li
	LIST OF CHARTS	lii
1	INTRODUCTION	1- 15
	1.1 Introduction	1
	1.2 Industry Profile	3
	1.3 Need for the Study	14
	1.4 Scope and Significance of Study	14
	1.5 Objectives of the Study	14
	1.6 Limitations of the Study	15
2	REVIEW OF LITERATURE	16-23
3	RESEARCH METHODOLOGY	24-25
	3.1 Research Design	24
	3.2 Sampling Technique	24
	3.3 Sources of Data	24
	3.4 Structure of Questionnaire	25
	3.5 Sample Size	25
	3.6 Period of Study	25
	3.7 Hypothesis/ Analytical Tools	25
4	DATA ANALYSIS AND INTERPRETATION	26-50
	4.1 PERCENTAGE	26
	4.2 ANOVA	46
	4.3 CHI-SQUARE	49
5	FINDINGS, SUGGESTIONS AND CONCLUSION	51-53
	5.1 Findings of the Study	51
	5.2 Suggestions	52
	5.3 Conclusion	53
	REFERENCES	54
	APPENDIX – I (Questionnaire)	60
	APPENDIX – II (Article)	62

ABSTRACT

The project entitled the “ A STUDY ON CONSUMER OPINION TOWARDS USE OF HAND SANITIZER DURING COVID” has attempted to analyse the behaviour , believe and preference of hand sanitizers among the people during covid-19 . The study is fully based on the primary data collected among the general public

This study is been organised in six chapter .The first chapter includes general introduction, industry profile , The second chapter is Review of literature this is based on the famous authors view about the research methodology about sanitizers and the analysis about the hypothesis published in journals and books

The third chapter is research methodology which includes research design, sources of data and tools used for analysis. The fourth chapter is Data analysis and interpretations which includes charts and tables. The fifth chapter is Findings, suggestions and conclusions.

The collected data has been analysed using various statistical tools like percentage analysis and analysis of variance (ANOVA) and Chi-Square . After analysing the data, general specific findings are sought out through interpretation. Suggestions are formulated from the summary of findings.

LIST OF TABLE

TABLE NO	PARTICULARS	PAGE NO
4.1.1	Respondents of gender	27
4.1.2	Respondent of age	28
4.1.3	Respondents of times do you sanitizing your hand	29
4.1.4	Respondents of thought about sanitizers would become your daily necessity	30
4.1.5	Respondents of preference of hand sanitizers with (or) without Alcohol	31
4.1.6	Respondents of preference of hand sanitizers for babies below 5 years of age	32
4.1.7	Respondents of Covid-19 Impacting The Demand For Hand Sanitizers In day to day life	33
4.1.8	Respondents Percentage Of People Believing Sanitizers Is Necessary During Covid 19	34
4.1.9	Percentage of Respondents Agree Sanitizers Is Better Than Washing Hands With Soap And Water	35
4.1.10	Percentage of Respondents Agree Sanitizers Kill All Bacteria And Virus	36
4.1.11	Respondents of Most preferred attributes in hand sanitizers	37
4.1.12	Percentage of Respondents checking drug factor panel	38
4.1.13	Percentage of Respondents Prefer Hand Sanitizer With Fragrance	39
4.1.14	Percentage of Respondents Preference Towards Branded And Non-Branded Sanitizers	40
4.1.15	Percentage of Respondents Prefer Sanitizer Even After Covid-19	41
4.1.16	Percentage of Respondents Stays Towards The Same Brand	42
4.1.17	Percentage of Respondents Agree Sanitizers Can Really Prevent You From Covid-19 Spread Through Hands	43
4.1.18	Percentage of Respondents use sanitizers kept in public places	44
4.1.19	People preference for the quality of the factor of the product	45
4.2.1	ANOVA calculation whether there is a significant associate between the factors of the sanitizers and the age of the respondents	47
4.2.2	ANOVA calculation whether there is a relationship between the gender and the believe over the sanitizers prevent from Covid-19	48
4.3.1	Table showing the associate between age of respondents and the preference for branded sanitizers	50

LIST OF CHART

CHART NO	PARTICULARS	PAGE NO
4.1.1	Respondents of gender	27
4.1.2	Respondent of age	28
4.1.3	respondents of times do you sanitizing your hand	29
4.1.4	Respondents of thought about sanitizers would become your daily necessity	30
4.1.5	Respondents of preference of hand sanitizers with (or) without Alcohol	31
4.1.6	Respondents of preference of hand sanitizers for babies below 5 years of age	32
4.1.7	Respondents of Covid-19 Impacting The Demand For Hand Sanitizers In day to day life	33
4.1.8	Respondents Percentage Of People Believing Sanitizers Is Necessary During Covid 19	34
4.1.9	Percentage of Respondents Agree Sanitizers Is Better Than Washing Hands With Soap And Water	35
4.1.10	Percentage of Respondents Agree Sanitizers Kill All Bacteria And Virus	36
4.1.11	Respondents of Most preferred attributes in hand sanitizers	37
4.1.12	Percentage of Respondents checking drug factor panel	38
4.1.13	Percentage of Respondents Prefer Hand Sanitizer With Fragrance	39
4.1.14	Percentage of Respondents Preference Towards Branded And Non-Branded Sanitizers	40
4.1.15	Percentage of Respondents Prefer Sanitizer Even After Covid-19	41
4.1.16	Percentage of Respondents Stays Towards The Same Brand	42
4.1.17	Percentage of Respondents Agree Sanitizers Can Really Prevent You From Covid-19 Spread Through Hands	43
4.1.18	Percentage of Respondents use sanitizers kept in public places	44
4.1.19	People preference for the quality of the factor of the product	45

CHAPTER-1

INTRODUCTION

1.1 INTRODUCTION OF STUDY

Hand sanitizers were first introduced in 1966 in medical settings such as hospitals and healthcare facilities. The product was popularized in the early 1990s . Hand sanitizer is a liquid, gel or foam generally used to kill the vast majority of viruses /bacteria / microorganisms on the hands . Hand sanitizer, also called hand antiseptic, hand rub, or hand rub, agent applied to the hands for the purpose of removing common pathogens (disease-causing organisms).Hand sanitizers typically come in foam, gel, or liquid form .Their use is recommended when soap and water are not available for hand washing or when repeated hand washing compromises the natural skin barrier (e.g., causing scaling or fissures to develop in the skin).Although the effectiveness of hand sanitizer is variable, it is employed as a simple means of infection control in a wide variety of settings, from day-care centres and schools to hospitals and health care clinics and from supermarkets to cruise ships.

Hand sanitizers do not serve as a replacement for thorough handwashing. Instead, they are thought to bring consumers some of the benefits of handwashing when handwashing is not practical .The relationship between hand sanitizer use and reduced illness has not been firmly established by epidemiological studies, but several laboratory studies suggest hand sanitizers help to prevent infections by killing transient pathogenic bacteria . Handwashing and hand sanitizers reduce microbial populations in different ways. Handwashing - whether done with "antibacterial" soap or plain soap - physically removes microorganisms from the skin, literally washing the live microbes down the drain. Hand sanitizers reduce levels of microorganisms by killing them chemically, just like disinfectants kill germs on environmental surfaces. Unlike disinfectants, which may be left practically on surfaces for up to about 5 minutes, hand sanitizers must do their job within a brief period of time to produce the necessary effect. The reality is that most people just won't tolerate wet hands for more than about 30 seconds. Accordingly, Micro chem Laboratory believes that 30 seconds - maybe one minute in special cases - should be the contact time limit for laboratory testing of hand sanitizers.

Hand sanitizers may be powered by a number of different active ingredients, but have you ever noticed that most hand sanitizers use alcohol as the active ingredient? That is largely a result of how they are regulated. The effectiveness of hand sanitizer depends on multiple factors, including the manner in which the product is applied and whether the specific infectious agents present on the person's hands are susceptible to the active ingredient in the product. In general, alcohol-based hand sanitizers, if rubbed thoroughly over finger and hand surfaces for a period of 30 seconds, followed by complete air-drying, can effectively reduce populations of bacteria, fungi, and some enveloped viruses .

Hand sanitizer, also called hand antiseptic or hand rub, agent applied to the hands for the purpose of removing disease-causing organisms. Hand hygiene is one of the most important measures to prevent the spread of infectious diseases. Hand sanitizer use is recommended when soap and water are not available for hand washing or when repeated hand washing compromises the natural skin barrier. Although the effectiveness of hand sanitizer is variable, it is employed as a simple means of infection control in a wider areas such as daycare centres, schools, hospitals, health care clinics and super markets. As a result of rising awareness about hand hygiene and its benefits, there has been a constant increase in demand of hand sanitizers. Hand sanitizers typically come in foam, gel, or liquid form. This project profile envisages manufacturing of alcohol based liquid hand sanitizer.

1.2 INDUSTRY PROFILE

India hand sanitizer market is projected to surpass \$ 43 million by 2025. Growth of hand sanitizer market in India can be attributed to rising awareness about healthy lifestyle & wellness, shifting consumer preference towards convenient hygiene products. Moreover, the strong marketing activities by leading brands, in addition to huge endorsements, are some other drivers of hand sanitizer market in India. Moreover, the COVID-19 outbreak has boosted demand for sanitizers like never before across the diverse end user segments. The hand sanitizer market is categorized into Gel, Liquid, Foam and Spray.

West India dominated the country's hand sanitizer market in 2019, and the region is expected to maintain its dominance during the forecast period. Some of the major players operating in India hand sanitizer market are Reckitt Benckiser (India) Ltd., Hindustan Unilever Ltd., Dabur India Ltd., Himalaya Drug Company Pvt. Ltd., ITC Ltd., and others.

The global hand sanitizer market size was valued at USD 1.64 billion in 2019 and is expected to reach USD 11.40 billion by 2022, representing a growth of 595%. The global market has been witnessing a surge since the breakout of the COVID-19 pandemic. This peak is likely to continue for the next two years and would start to normalize after 2022. The pandemic has increased focus on the importance of washing hands as a simple and cost-effective solution to reduce disease spread.

The WHO emphasized the need to focus on longer-term uptake to form handwashing habits. Several government bodies are considering designing and adapting handwashing behaviour change programs that are effective during COVID-19. This, in turn, is expected to fuel the demand for liquid hand wash during the forecast period. Moreover, the surge in adopting new formulation of hand sanitizers by manufacturers to provide an enhanced experience to consumers drives the market growth. The increasing popularity of organic sanitizers, which are eco-friendly, skin-safe, and sustainable, is also likely to influence market growth. Continuous innovations in formulations and dispenser designs such as touchless dispensers are gaining traction in the market.

1.2.1 HISTORY OF HAND SANITIZERS

The Centres for Disease Control and Prevention do note that, when it comes to preventing the spread of coronavirus, "if soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol."

But while alcohol has been in use as an antiseptic since the late-1800s at least, the exact origins of hand sanitizer are up for debate. One version of the story points to Lupe Hernandez, a nursing student in Bakersfield, California in 1966, as the inventor of hand sanitizer after combining alcohol and gel for use by doctors in situations where they don't have time to access soap and warm water before treating patient

There's also Sterillium, which the German company Hartmann claims was "the world's first marketable alcohol-based hand disinfectant" when it hit European shelves in 1965. It's made with glycerine and 75% alcohol.

Still, others trace modern hand sanitizer back to Goldie and Jerry Lippman, the married couple that developed a waterless hand cleaner in 1946 for rubber plant workers who previously used harsh chemicals like kerosene and benzene to remove graphite and carbon black from their hands at the end of their shifts. The product, which they called Gojo (a portmanteau of their names) is a mix of petroleum jelly, mineral oil and less than 5% alcohol that's still used today by auto mechanics and other workers to clean off substances like grease and oil.

The Lippman's mixed their first batches of Gojo in a washing machine in the basement of Goldie's parents' Akron, Ohio home, where the couple was living at the time, according to The New Yorker. They put the resulting product in pickle jars and sold it out of the trunk of their car.

Over the ensuing decades, Gojo continued selling their products as industrial cleaners. Then, in 1988, the company invented the hand gel Purell, which consists of 70% ethyl alcohol as its primary ingredient, along with propylene glycol. While Purell is now the world's best-selling hand sanitizer, it took some time for stores to

carry the product that most everyday customers weren't really asking for. As such, Gojo did not release Purell onto the consumer market until 1997. That same year, Vi-Jon Industries followed Gojo's lead by introducing GermX, which is now the second best-selling hand sanitizer in America, after Purell, according to Nielsen.

1.2.2 An FDA warning

FDA is currently not aware of any adequate and well-controlled studies demonstrating that killing or decreasing the number of bacteria or viruses on the skin by a certain magnitude produces a corresponding clinical reduction in infection or disease caused by such bacteria or virus,” the FDA wrote in its letter. The most important sanitizing ingredient is Ethyl or Isopropyl alcohol at a very high concentration, say at 96% (WHO). This is to ensure that when mixed with the solution, the final product would be around 70 to 80% concentration, as required by the FDA and CDC. Hand sanitizer manufacturing in an FDA-regulated factory requires a high level of precision in its formulation, mixing and filling processes. To achieve quality and batch-to-batch consistency, third party tests and in-house testing are performed.

Still, the FDA's concerns don't seem to have put a damper on consumers' desire for more hand sanitizer as the coronavirus pandemic continues to spread. FDA has published Policy for Temporary Compounding of Certain Alcohol-Based Hand Sanitizer Products . Here is the summary of FDA's temporary policy for hand sanitizers.

Because of the public health emergency posed by COVID-19, FDA does not intend to take action against compounders that prepare alcohol-based hand sanitizers for consumer use for the duration of the public health emergency declared by the Secretary of HHS on January 31, 2020,

provided the following circumstances are present:

1. The hand sanitizer is compounded using only the following United States Pharmacopoeia (USP) grade ingredients in the preparation of the product (percentage in final product formulation) consistent with World Health Organization (WHO) recommendations:

- a. Alcohol (ethanol) (80%, volume/volume (v/v)) in an aqueous solution denatured according to Alcohol and Tobacco Tax and Trade Bureau regulations in 27 CFR part 20; or Isopropyl Alcohol (75%, v/v) in an aqueous solution
- b. Glycerol (1.45% v/v).⁷
- c. Hydrogen peroxide (0.125% v/v).
- d. Sterile distilled water or boiled cold water.

The compounder does not add other active or inactive ingredients. Different or additional ingredients may reduce the safety and effectiveness of the product.

2. The compounder pays particular attention to ensure the ethanol or isopropyl alcohol active ingredient is correct and the correct amount of the active ingredient is used.
3. The hand sanitizer is prepared under conditions routinely used by your facility to compound similar non sterile drugs.
4. The hand sanitizer is labelled consistent with the below mentioned labelling format.

DRUG FACTS LABEL	
Drug Facts	
Active ingredient[s] Isopropyl alcohol 75% v/v.....	PurposeAntiseptic
Use[s] Hand sanitizer to help reduce bacteria that potentially can cause disease. For use when soap and water are not available.	
Warnings For external use only. Flammable. Keep away from heat or flame Do not use • in children less than 2 months of age • on open skin wounds When using this product keep out of eyes, ears, and mouth. In case of contact with eyes, rinse eyes thoroughly with water. Stop use and ask a doctor if irritation or rash occurs. These may be signs of a serious condition. Keep out of reach of children. If swallowed, get medical help or contact a Poison Control Center right away.	
Directions • Place enough product on hands to cover all surfaces. Rub hands together until dry. • Supervise children under 6 years of age when using this product to avoid swallowing.	
Other information • Store between 15-30C (59-86F) • Avoid freezing and excessive heat above 40C (104F)	
Inactive ingredients glycerin, hydrogen peroxide, purified water USP	

**Alcohol Antiseptic 80%
Topical Solution**

**Hand Sanitizer
Non-sterile Solution**

[Insert Volume of Product in mL]

Figure 1.2.1 showing drug factor label

1.2.3 HAND SANITIZER MARKET GROWTH

The India hand sanitizer market grew at a CAGR of around 14% during 2014-2019. Hand sanitizer is among the several personal care products that have shifted from being luxury products to essential items due to the changing socio-economic scenario and increasing westernization and urbanization trends in India. Furthermore, the demand of hand sanitizers have surged since 2020 as a result of the Covid-19 outbreak. This has resulted in several players - small and large- entering this market.

The rising healthcare investments for providing a high-end and safer medical environment for healthcare professionals by preventing hospital-acquired infections (HAIs) have augmented the demand for hand sanitizers in the medical sector. Furthermore, as a result of the COVID-19 pandemic in the country, the demand of hand sanitizers has increased exponentially since the start of 2020. This has led to the widening demand-supply gap and highly inflated product prices. Owing to this, several regional manufacturers are expanding their production capacities in compliance with statutory permissions by the government for maximizing the production of hand sanitizers to meet its robust demand. Besides this, the Indian government has also issued production licenses to several distilleries and new manufacturers to produce hand sanitizers in bulk for adequate supply in the country. In addition to this, improving consumer living standards along with improving product availability across several online and offline distribution channels have also bolstered the market for hand sanitizers in India. Looking forward, IMARC Group expects the India hand sanitizer market to continue its strong growth during the next five years.

1.2.4 Factors Affecting the Market Growth

As per our analyst estimates, the significantly increasing personal safety and hygiene concerns among the consumer during the pandemic is projected to fuel the global hand sanitizer market growth. On the other hand, the health hazards associated with chemical ingredients are expected to obstruct the growth of the global hand sanitizer market

Fundamental Concepts Underlying Hand Sanitation Practices

Hand hygiene is the leading preventative measure to reduce the fecal-oral route of pathogen transmission (Boyce & Pittet, 2002). To reduce infection or illness, proper hand hygiene practices must be accepted and used (Larson & Kretzer, 1995). Poor hand hygiene compliance is common among hand sanitation studies (Hilburn et al., 2003; Storr & Clayton, 2004). Reported reasons for not cleaning hands include skin irritation, inaccessible hand sanitation supplies, wearing gloves, being too busy, or not thinking about it. However, people commonly believe they cleaned their hands when necessary even when observations indicated otherwise (Dubbert, Dolce, Richter, Miller, & Chapman, 1990)

Hand hygiene training can be efficient in improving knowledge, but is less effective for motivating people actually to use good hand hygiene practices (Glanz & Rimer, 1997; Manuel, Tam, Sameer, 2008; Martin, Knabel, & Mendenhall, 1999; Roberts et al., 2008). The Department of Health and Human Services recommended the incorporation of behavioral interventions to improve hand hygiene attitudes by targeting individuals' motivational systems (Glanz & Rimer, 1997). To increase the effectiveness of a promotional program, the designer must first understand how behavior interacts with beliefs and knowledge (Green, Ottoson, Garcia, & Robert, 2009). This understanding can be facilitated by using theory-based models when developing educational materials (O'Boyle, Henly, & Larson, 2001; Storr & Clayton, 2004).

Within the broad range of theory facilitated research, there have been several types of studies. One stream of research has focused on individual compliance with hand sanitation practices by using intention or practice as the dependent variable (Ejemot-Nwadiaro, Ehiri, Meremikwu, & Critchley, 2008; O'Boyle, Hanley, & Larson, 2001). Another stream of research has focused on implementation success at the organizational level (Burke & Ockene, 2001; Hedstrom, Karlsson, & Kolkowska, 2013). Each of these approaches makes a significant and unique contribution to the literature. Compared to the other theories that focus more on external variables such as self-efficacy and outcome expectancy, this study will employ the use of the Theory of Planned Behavior to explore the intention behind hand sanitation behavior.

1.2.5 Technical aspects:

a) Types of Hand Sanitizers:

Depending on the active ingredient used, hand sanitizers can be classified into two types: alcohol-based or alcohol-free. Alcohol-based products typically contain between 60 and 95 percent alcohol, usually in the form of ethanol, isopropanol. At those concentrations, alcohol immediately denatures proteins, effectively neutralizing certain types of microorganisms. Alcohol-free products are generally based on disinfectants, such as benzalkonium chloride (BAC), or on antimicrobial agents, such as triclosan. The activity of disinfectants and antimicrobial agents is both immediate and persistent. Many hand sanitizers also contain emollients (e.g., glycerin) that soothe the skin, thickening agents, and fragrance.

b) Raw Material for Sanitizer Production:

The principal raw materials required for the production of hand sanitizer are Ethanol or Isopropanol, Glycerol, Hydrogen Peroxide, distilled water and essential oil such as peppermint or Lavender oil or lemon extract. All the enlisted raw materials can be procured locally.

c) Hand sanitizer Production Unit Setup & Machinery:

Selecting a right location for factory operation is an important aspect. Major required utilities are water and electricity. Easy availability of transport facility and labour is important. Create a floor plan indicating specific space for raw material storage, finished products storage, production unit area, administrative work space, store room and space for miscellaneous usage. Generally, you will need to have 2000 sq.ft of non-agricultural land for establishing an improved sanitizer manufacturing unit. Here, you can erect a plant (1000 sq.ft) with a processing capacity of 240kiloliters/annum. Additionally, the land must come with proper elevation.

1.26 Hand sanitizer manufacturing plant machinery / equipment's consists of the following:

1. Raw material / Alcohol Storage Vessel(Recommended only if you are planning to go for big size mfg. plant ex 500 ltrs and above)
2. Transfer Pump to transfer alcohol to manufacturing vessel
3. Manufacturing/ mixing vessel
4. Product storage vessel
5. Transfer Pumps (2 nos – One to transfer sanitizer from mfg vessel to storage vessel and one from storage vessel to filling machine)
6. Filling line consisting of filling machine, capping machine, labeling machine & ink jet printer for batch coding.
7. Working platform, control panels, essential pipes, valves and filters
8. Weighing balance

d) Hand Sanitizer Production Process & Technology

1. Production Technology

1. In a 500 L stainless steel jacketed vessel add 333.3 L of Ethanol. Using the jacket control, temperature of the batch to be maintained at less than 20 °C.
2. Turn on the mechanical Stirrer. To this add 16.7 L hydrogen peroxide.
3. To the above solution add 5.8 L glycerol.
4. Add 41 L of distilled water and continue stirring for 30 mins to ensure uniform mixing by keeping the batch temperature at less than 20 °C throughout the process.

5. Finally add 3.2 L of essential oil (clove, Eucalyptus, peppermint or citrus oil) for fragrance and continue stirring for 30 mins.

Alcohol storage tanks must be minimum 10 times the capacity of the manufacturing vessel so that, at least 10 batches could be catered before refilling the alcohol storage tank. For making sanitizer in gel form, add Carbopol which will thicken the sanitizer into gel form. Permitted colour & perfume may be added as required. The homogenizer will mix the Carbopol into alcohol and water to give uniformity. Then once the sanitizer is ready transfer it to storage vessel and take it for filling. For small quantity preparation, the tanks should be calibrated for the ethanol/isopropyl alcohol volumes and for the final volumes of either 10 or 50 litres and kindly ensure below containers are used,

- 10-litre preparations: glass or plastic bottles with screw threaded stoppers can be used.
- 50-litre preparations: large plastic (preferably polypropylene, translucent enough to see the liquid level) or stainless steel tanks with an 80 to 100 litre capacity should be used to allow for mixing without overflowing. The storage tank / bottles should be kept in quarantine for 72 hours. This allows time for any spores present in the alcohol or the new or re-used bottles to be eliminated by Hydrogen Peroxide.

d) Quality & specification requirements

In general alcohol based hand sanitizers has shelf life of 2 years. However if stored under proper storage conditions, shelf life can be extended up to 3 years. For hand sanitizer production, mentioning the shelf life on packets or labels is mandatory. The quality of Alcohol to be used should be about 91-99 % purity. The ISI specification of hand sanitizer is No. IS-4117:2008. The entrepreneur may approach the appropriate authorities of 'Drugs & Cosmetics' license department or ISI specification for better marketing of the product.

The Mixing Machine

This is the equipment used for mixing the ingredients. This can be a Vacuum Emulsifier, High Shear Mixer or a Powder-liquid Disperser Mixer which can make small to large batches of hand sanitizer solution.

In order to achieve an agglomerate-free mixture and consistent batch-to-batch hand gel solutions, you should have a high speed mixer.

Filling Machine

This is a machine used for accurately filling container bottles for hand sanitizers. You have several options such as Liquid Filling Machines and Viscous Liquid Filling Machines

The operation would depend on the viscosity of the product. There are filling machines with gravity filling nozzles or piston induced nozzles. That is to

accommodate a variety of viscosities. If you are producing hand sanitizer gels, you might want a piston-induced nozzle as the product is more viscous than sprays, foams and liquids.

Capping Machine

An automated machine, capping machines can automatically cap bulk hand sanitizer containers in a matter of an hour. You may have several options such as Screw Capping Machines, Rotary Vacuum Screw Capping Machine. For capping the bottles, you can use automatic capping machines for securely tightening hand sanitizer screw-capped containers.

These machines work by capping PET hand sanitizer bottles with its pump dispenser head or its cap. Usually, a capping machine has four rollers or heads which applies torque to tighten threaded caps to the threaded bottle neck.

Capping machines have a PLC program for automatic adjustments of parameters such as speed and size of the bottles. The rollers are adjustable to process different

cap diameters and heights. Thus, changeover is faster. These machines can further process usually between 40 to 100 bottles per minute.

Labelling Machine

Labelling machines can accurately put a brand or emboss a name on your containers. A variety of options include Pressure Sensitive Labeller, Optical Laser Printing Machine, Inject Printing Machine

Hand sanitizer Production License & Registration

In establishing a hand sanitizer production unit, you will need to obtain several different license and registration from different Government authority.

1. UAM Registration (udyogaadhaar.gov.in)
2. Company Registration with ROC
3. Trade License
4. Factory License
5. Drugs & Cosmetics License
6. BIS Certification
7. Fire License (easybusiness.tn.gov.in)

Safety Measures

Special requirements apply to the production and storage of the formulations, as well as the storage of the primary products. The main safety issues relate to the flammability of alcohol-based hand rub sanitizer. The manufacturing process and building must comply good manufacturing practices (GMP).

The flash points of ethanol 80% (v/v) and isopropyl alcohol 75% (v/v) are 17.5°C and 19°C, respectively, and special attention should be given to proper storage in tropical climates. Production and storage facilities should be ideally air-conditioned or cool rooms.

Open flames and smoking must be strictly prohibited in production and storage areas. Local and central (bulk) storage must comply with fire regulations regarding the type of cabinet and store, respectively. National safety guidelines and local legal requirements must be adhered to for the storage of ingredients and the final product.

A designated 'highly flammables' store will be required for situations where it is necessary to store more than 50 litters. Containers and dispenser cartridges containing hand rub should be stored in a cool place away from sources of ignition. This applies also to used containers that have not been rinsed with water.

1.3 NEED OF STUDY

- This research is conducted for the purpose to study about the consumer opinion toward the use of hand sanitizer during and the period before covid-19. This includes the believe of consumer toward the use of hand sanitizers.
- This form allows us to understand the gender difference in perspective of the hand sanitizer.
- This study is also uses full for identifying whether people are aware of warnings and the approval of the sanitizer
- Consumers differs as individuals , in their needs , expectation and behaviour. When their needs are not satisfied or their objectives are not achieved the result is dissatisfaction . This study's conducted for the purposes to identify in what combination would people prefer the sanitizer.

1.4 SCOPE OF STUDY

- The research helps to analyse the believe of the consumers of the hand sanitizers during Covid-19
- The Research measures the preference of the consumers of hand sanitizers

1.5 OBJECTIVES OF STUDY

The overall purpose of this study is to identify the cognitive stimulants and barriers of using hand sanitizers among people in the covid-19. Specific objectives include .

1.5.1 Primary Objective

1. Identify the behavior that people have about using hand sanitizers after covid-19

1.5.2 Secondary Objective

1. Identify the attribute that people consider when choosing to use hand sanitizers
2. Identify the perceived behavioral control beliefs that makes people not believing sanitizers in covid-19

1.6 LIMITATIONS OF THE STUDY

- The analysis of the present study has been carried out based on the information has collected from the general public
- The study is an opinion survey; caution may have to be exercised while extending the result to other areas.
- Due to time constrict only 150 numbers of respondents were considered.

CHAPTER - 2

REVIEW OF LITERATURE

The hand plays an important role in transmission of infectious agents as suggested by Semmelweis particularly when people live in close contact with each other. The contagious agents can be spread through hands in families, schools, college dormitories. In close contact the infectious agents are not only transferred by hand to hand contact but also indirectly by inanimate objects like door knobs sitting ground etc

In 2007, a study was conducted to review the effectiveness of hand sanitizer in reducing the respiratory infection. Currently hand hygiene is considered as one the most important measure to prevent any hand transmitted infection like COVID

1. A control belief is defined as a person's estimation of the likelihood that a given facilitating or inhibiting factor will be present (Ajzen, 1985). For example, one might believe that it is extremely unlikely that he/she will have enough time to sanitize his/her hands before lunch. At the same time, that person might be extremely confident that he/she has the necessary hand sanitation skills. Each control belief contributes to perceived behavioral control, or a sense of self-efficacy, in direct proportion to the perceived power of the factor to facilitate or impede the performance of the behavior (Ajzen, 1985). For example, despite a high competence of one's hand sanitation capability, time pressures at work may exercise more power to hamper hand sanitation behavior, thereby, reducing perceived control over the behavior
2. A function of a set of beliefs concerned with the likelihood that important individuals, such as spouse, parents, or friend, would approve or disapprove of the behavior (Ajzen & Madden, 1986).
3. A property of measuring instruments or of responses, indicating the extent to which they measure what they are supposed to measure (Feldman & Lynch, 1988; Lynn, 1986).

4. According to **Blackwell et al (2006)** consumer buying behaviour is itself is a complex, dynamic issue which cannot be defined easily and commonly. Therefore, the concept of consumer buying behaviour has been defined in different ways by different researchers.
5. According to **James C. Cox** in The Economic Journal, consumer economics traditionally operates on the hypothesis that consumers seek the most utility, or satisfaction, that they can buy. Consumer preferences involve the ranking of goods and services according to how much benefit they afford. The study of consumer preferences employs assumptions about consumers' behavior and how they decide preferences.
6. Another valuable argument is provided by **Egen (2007)** on the importance of understanding the consumer behaviour. According to the author, better awareness of consumer buying behaviour is a positive contribution to the country's economic state. The author further argues that the quality of goods and products are exceptionally good in countries where buying behaviour of consumers is well understood. This in turn increased the competitiveness of the products and services in international market increasing the export potential of the country. Meanwhile, high quality of domestic products and services lead to sophisticated domestic customers' base.
7. Any behavior can be defined in terms of four elements: the action, the target at which the action is directed, the context in which it is performed, and its time of occurrence (**Ajzen & Fishbein, 1977**)
8. Any behavior can be defined in terms of four elements: the action, the target at which the action is directed, the context in which it is performed, and its time of occurrence (**Ajzen & Fishbein, 1977**)
9. **Bailey (1978)** A hypothesis is a proposition in testable form and predicts a particular relationship between two or more variables. If a researcher thinks that a relationship exists, he should first state it as a hypothesis and then test the hypothesis in the field.
10. Beliefs about the likelihood that one possesses the resources and opportunities thought necessary to execute a behavior (**Ajzen & Fishbein, 1980**).
11. consumer buying behaviour is a process of selecting, purchasing and disposing of goods and services according to the needs and wants of the consumers.

However, there is a general consensus among the researchers and academics that this process is subject to continual change over time as the purchase characteristics of the customers change due to their physical and psychological needs.

12. Consumer buying behaviour is defined by **Stallworth (2008)** as a set of activities which involves the purchase and use of goods and services which resulted from the customers' emotional and mental needs and behavioural responses. It is further stated by **Gabbot and Hogg (1998)** that the process may contain different activities and stages.
13. **Daniel Stolt** : "Carvacrol could potentially be used as a food *sanitizer* ... particularly in conjunction with other antimicrobials," says Kelly Bright, associate research scientist in the department of soil, water, and environmental science at the University of Arizona
14. **David M. Lane** Analysis of Variance (ANOVA) is a statistical method used to test differences between two or more means. It may seem odd that the technique is called "Analysis of Variance" rather than "Analysis of Means." As you will see, the name is appropriate because inferences about means are made by analyzing variance.
15. **Divisha Arya (2016)** states that the Study of Consumer Behavior has become essential. Consumers are the kings of markets. Without consumers no business organization can run. Consumer behavior involves the psychological processes that consumers go through in recognizing needs, finding ways to solve these needs, making purchase decisions, interpret information, make plans, and implement these plans. Consumers often buy products not because of their attributes per se but rather because of the ultimate benefits that these attributes provide, in turn leading to the satisfaction of ultimate values. Consumer behavior is a complex, dynamic, multidimensional process, and all marketing decisions are based on assumptions about consumer behavior. Models of consumer behavior play a key role in modern empirical Industrial Organization.
16. **Engel, et al. (1986)** : **define consumer behaviour** "Those acts of individuals directly involved in obtaining, using, and disposing of economic goods and services, including the decision processes that precede and determine these acts"

17. Freedom of behavior is a valuable and pervasive aspect of human life. People continually survey their internal and external environment and make decisions about what, how, and when they will do things (Festinger, 1962). They consider their wants and needs, the dangers and benefits, and the ways in which they can accomplish various ends. It is not to say that behavior is always freely selected (Runkel & Macgrath, 1972). Frequently, individuals perform acts without quite knowing why, and conversely they perform actions because they knew they were not free to do otherwise (Festinger & Carlsmith, 1959). However, most of the time people are free to engage in a variety of different behaviors and can select among these as they please.
18. Generally research questions are derived from preconceptions. When study samples respond to these questions they react differently with reality . Meanwhile, frame of reference formed in the minds of people due to preconceptions, repeatedly effect on findings of any research either directly or indirectly. Johansson **Lindfors (1993)** writes there are three major aspects to be considered in perceptions; Epistemological perceptions, Common perceptions and Theoretical perceptions
19. **Goldsmith et al. (2001)** find that the variety of the offering on the Internet has an important influence on its adoption as a purchasing method because it enables consumers to compare, contrast and choose between the alternatives available for meeting their needs while reducing the search costs (Grewal et al, 2004). Empirical evidence also confirms that Internet buying is influenced by consumers' perception of a price advantage [Meuter et al., (2000); Vijayasarathy and Jones, (2000); Grewal et al., 2003)], which is more important for online shoppers than for offline shoppers (Iqbal et al., 2003), since the consumer has rapid and simultaneous access to pricing information for all the products on the Internet (Sinha, 2000)
20. **Grinnell (1988)** Hypothesis is written in such a way that it can be proven or disproven by valid and reliable data. From these definitions, we can see that a hypothesis is based on a tentative proposition and its validity is unknown. We will explore the functions of a hypothesis in the next section.
21. **Grinnell (1988)** The Alternative Hypothesis: The alternative hypothesis is a statement of what a hypothesis test is set up to establish. Designated by: H1 or

Ha. It is opposite of Null Hypothesis. It is only reached if Ha is rejected. Frequently “alternative” is actual desired conclusion of the researcher.

22. Hand washing is one of the most efficient and inexpensive procedures for reducing infections and foodborne diseases (Hedberg, Smith, Kirkland, Radke, Jones, Selman, & EHS-Net Working Group, 2006; **Park, Barclay, Macinga, Charbonneau, Pettigrew, & Vinje, 2010**; Todd, Bartleson, & Michaels, 2007). Many foodborne diseases and pathogenic microorganisms are spread by contaminated hands (World Health Organization, 2009). Reports indicate that the simple act of washing hands with soap and water reduces incidents of diarrhea from Shigella and other causes by up to 35% (Bartram, Osseiran, & Schlein, 2001).
23. **Howard Riell**: Among the equipment that impressed him: ... A wall-mounted food *sanitizer* that diverts water from the sink tap and charges it with ozone before dispensing it through the aerator for produce cleaning.
24. **Karl Pearson (1857-1936) (Magnello, 2005)**. Chi-square goodness of fit tests, independence tests, and homogeneity tests that were developed by Pearson are the most significant contributions that he made to the modern statistics theory. The significance of Chi-square distribution of Pearson is that statisticians can use statistical methods that do not depend on normal distribution in order to interpret findings. The significance of Chi-square value is determined by using the suitable degree of freedom and degree of significance and consulting a Chi-square table (Moore, 1994). The two special purposes of Chi-square test are to test the hypothesis that there is no correlation among two or more groups, populations or criteria, and to test to what extent the observed data distribution fits to the expected distribution.
25. **Kotler and Keller (2011)** highlight the importance of understanding consumer buying behaviour and the ways how the customers choose their products and services can be extremely important for manufacturers as well as service providers as this provides them with competitive advantage over its competitors in several aspects. For example, they may use the knowledge obtained through studying the consumer buying behaviour to set their strategies towards offering the right products and services to the right audience of customers reflecting their needs and wants effectively

26. **Kotler (1994):** Consumer behaviour is the study of how people buy, what they buy, when they buy and why they buy.
27. **Lancaster et al (2002)** to better understanding the consumers' buying behaviour, companies also engage in advertising and promotion activities to influence the consumers' purchasing decision. However, when they are engaging in such types of activities, they need to consider other external factors such as the overall economic conditions of the country, politics, technology and ethnic culture all of which are beyond the control of both the company and consumer
28. **Laura Landro** : : a substance or product that is used to reduce or eliminate pathogenic agents (such as bacteria) on surfaces Sales of alcohol-based hand *sanitizers* were up nearly 17% as of the first week of September compared to the same period last year ...
29. **Muto, Sistrom, & Farr, 2000**; Larson, Gomez, Lee, Della, Kain, & Keswick, 2003; Liu et al., 2010) have questioned the effectiveness of alcohol-based hand antisepsis (e.g. sanitizers, foams, and wipers) compared to traditional soap-water hand washing. Larson et al. (2003) conducted a longitude study of 224 primary caretakers in households in northern Manhattan, New York to compare the difference between those who washed their hands with soap and water and those who used a commercial antimicrobial product. The researchers found no significant differences in the mean bacterial log counts either before or after hand washing between homemakers using the antimicrobial product or plain soap at baseline or after a year of use
30. Normative Beliefs: Perceptions of significant others' preferences about whether one should perform a behavior (**Ajzen, 1971**).
31. Perceived Behavioral Control (PBC): An individual's belief about the control that helps or hinders the implementation of that behavior (**Ajzen, 1985**)
32. Perceptions about what important people think a person should do (**Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007**).
33. Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information

on a specific topic. Research is an academic activity and the term should be used in a technical sense. -**William Emory** defines Research

34. **Schiffman (2007)** : “the behaviour that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs”
35. Self-efficacy: The conviction that one can successfully execute a given behavior (**Ajzen, 1991**)
36. **Solomon et al. (1995)**: Consumer is the study “of the processes involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires”
37. supplement or alternative to hand washing with soap and water. The active ingredient in hand sanitizer may be isopropyl alcohol (isopropanol), ethanol, n-propanol, or 9 povidone-iodine. Inactive ingredients in alcohol rubs typically contain a thickening agent such as polyacrylic acid for alcohol gels, humectants such as glycerin for liquid rubs, propylene glycol, and essential oils of plants (**Boyce & Pittet, 2002**)
38. Temporarily, epistemological perception is a method used to explain the knowledge in the form of theories (**Fisher, 2004**). Thus, it is obligatory to know the acceptable knowledge of any discipline. While formation of common perception are developed through personal experience or first-hand information gathered from work or studies, Theoretical preconceptions provide an opportunity to appraise a range of views attained through various theories of academic sources, books, journals, articles, and magazines. To be precise they are impractical to compile through personal experience (**Johansson Lindfors, 1993**).
39. The definition formed by **Solomon et al (1995)** describes consumer buying behaviour as a process of choosing, purchasing, using and disposing of products or services by the individuals and groups in order to satisfy their needs and wants. Similar definition of consumer buying behaviour is offered by Schiffman and **Kanuk (2000)** in which they describe it as behaviour that consumers express when they select and purchase the products or services using their available resources in order to satisfy their needs and desires.

40. The extent to which a person feels inclined to match his or her behavior to various sources of social pressure (**Bearden, Netemeyer, & Teel, 1989**).
41. **The Food and Drug Administration** (FDA) is a government agency established in 1906 with the passage of the *Federal Food and Drugs Act*. The agency is separated into divisions that oversee a majority of the organization's obligations involving food, drugs, cosmetics, animal food, dietary supplements, medical devices, biological goods, and blood products.
42. Theory of Planned Behavior (TPB): A theory that explains behavior as an antecedent of three variables: attitude, subjective norm, and perceived behavioral control (**Ajzen & Fishbein, 1980**).
43. **VOCAB BUILT** : Sanitizer is a substance or fluid designed to kill germs on skin and objects. To *sanitize* means to clean something by removing the dirt or destroying the germs on it. Food service operations use sanitizer to clean their equipment so that food doesn't become contaminated with bacteria or other stuff that shouldn't be in it. Sanitizer also refers to household products (especially hand sanitizer) that are used to prevent the spread of disease by killing germs on surfaces and skin
44. when customers browse and navigate ecommerce web sites, they leave a behavior trail that can be recorded and analyzed. (**Iqbal, 2003**) By using customers' personal information from all channels, retailers can launch more targeted and personalized marketing campaigns across channels. With successful back stage integration, retailers can develop a single cross-channel conception of a customer, which, according to customer research, leads greater customer satisfaction and retention.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

Research design is the specification of the method and procedure for acquiring the information needed to solve the problem. The research design followed for this research study is descriptive research design where we find a solution to an existing problem .

3.1.1 Descriptive Research design

Descriptive research is a study designed to depict the participants in an accurate way. More simply put, descriptive research is all about describing people who take part in the study.

3.2 SOURCE OF DATA .

3.2.1 Primary data

Primary data are collected through questionnaires. The questionnaire tried to capture the responses of the customers mainly on the key deliverables, derived from the survey conducted .

3.2.2 Secondary data

Secondary data refers to data that was collected by someone other than the user. Common sources of secondary data for Journal, Books, Websites, organisational records and data that was originally collected for other research purposes.

3.3 STRUCTURE OF QUESTIONNAIRE

There are two broad types of questions open ended or open questions, and closed ended or closed questions. Open questions enable respondents to answer as they wish. Closed questions provide respondents with a list of options from which they choose.

3.4 SAMPLING TECHNIQUE

3.4.1 Convenience sampling method

A convenience sample is one of the main types of non-probability sampling methods. A convenience sample is made up of people who are easy to reach.

3.5 PERIOD OF STUDY

The period of study is from January 2021 to March 2021 which is a three months of study

3.6 SAMPLE SIZE

A sample of 150 respondents was taken into consideration for my study and the data was collected.

3.7 ANALYTICAL TOOLS

Techniques are used to obtain findings and arrange information in logical sequence from the raw data collected . After the tabulation of data the tools provide a scientific and mathematical solution to complex problems. The present study uses the following statistical tools for analysing the collected data .

- PERCENTAGE
- ANOVA
- CHI-SQUARE

CHAPTER – 4

DATA ANALYSIS AND INTERPRETATION

4.1 PERCENTAGE ANALYSIS :

Percentage analysis it refers to a special kind of rates, percentage are used in making comparison between two or more series of data. a percentage is used to determine relationship between the series Percentage. Percentage analysis shows the entire population of terms of percentage . It reveals the number of belongings in the particular category of the number of people preferring a particular thing in terms of percentage . In the study , the number of people who has responded is in a particular manner is interpreted in forms of percentage Each table has been calculated on the basis of percentage . Besides being especially useful when making comparisons, they come in handy for studying a difference compared with a benchmark or initial value.

T26-able 4.1.1 Respondents of gender

PARTICULARS	NO OF RESPONDENTS	PERCENTAGE
MALE	71	47.3%
FEMALE	79	52.7%
TOTAL	150	100%

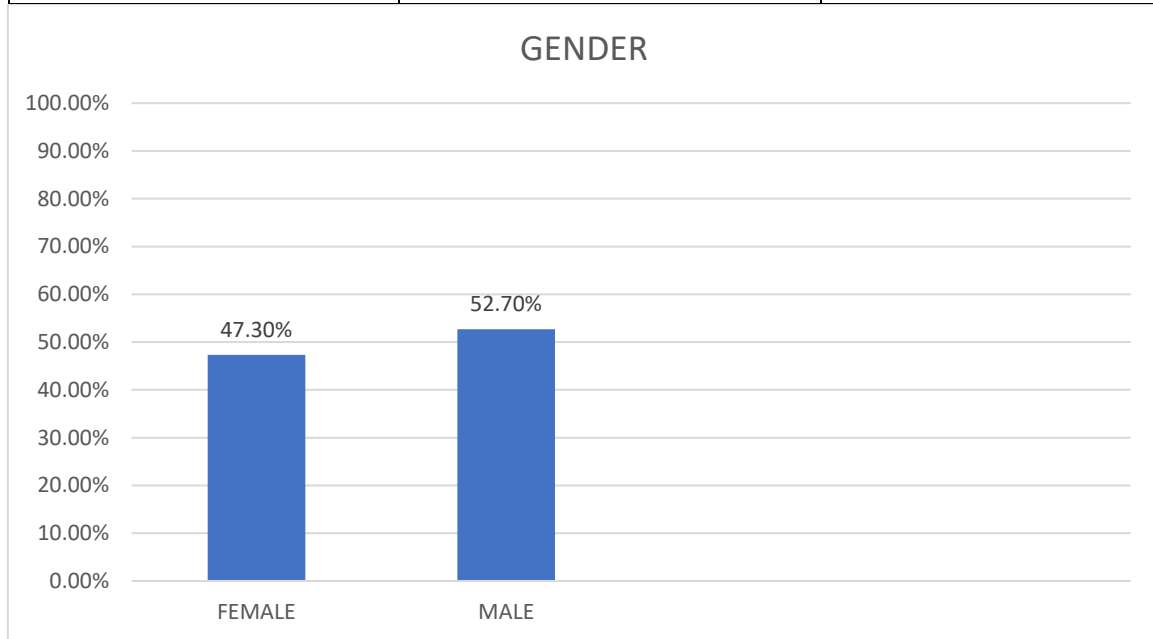


Chart 4.1.1 Respondents of gender

Source : primary data

INTERPRETATION

From the above table it is interpreted that 47.3% of respondents of male category and 52.7% is female category among the 150 responses collected

INFERENCE

- ❖ The majority (52.7%) of the responses is female

Table 4.1.2 Respondent of age

PARTICULARS	NO OF RESPONDANTS	PERCENTAGE
BELOW 15	5	3.3%
16-25	96	64%
25-35	24	16%
ABOVE 35	25	16.7%
TOTAL	150	100%

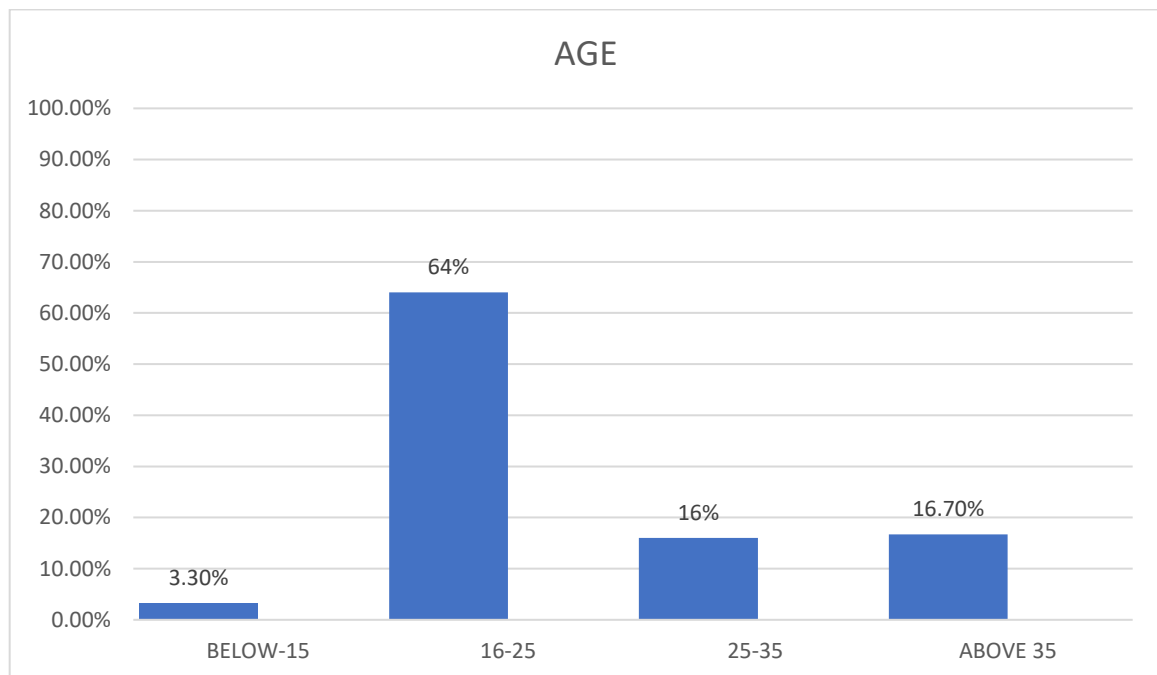


Chart 4.1.2 Respondent of age

Source : Primary Data

INTERPRETATION

From the above data it is interpreted that 3.3% of people below 15 years of age , 64% of people is between 16-25 and 16% of people is between 26-35 finally above 35 years of age there are 16.7% responses

INFERENCE

- ❖ The majority (64%) of the responses are from the age group of 16-25

Table 4.1.3 Respondents of times do you sanitizing your hand

PATICULARS	NO. OF RESPONSES	PERCENTAGE
MANY TIMES	47	31.3%
ONLY WHEN NEEDED	74	49.3%
DON'T MIND	23	15.3%
NEVER	6	4%
TOTAL	150	100%

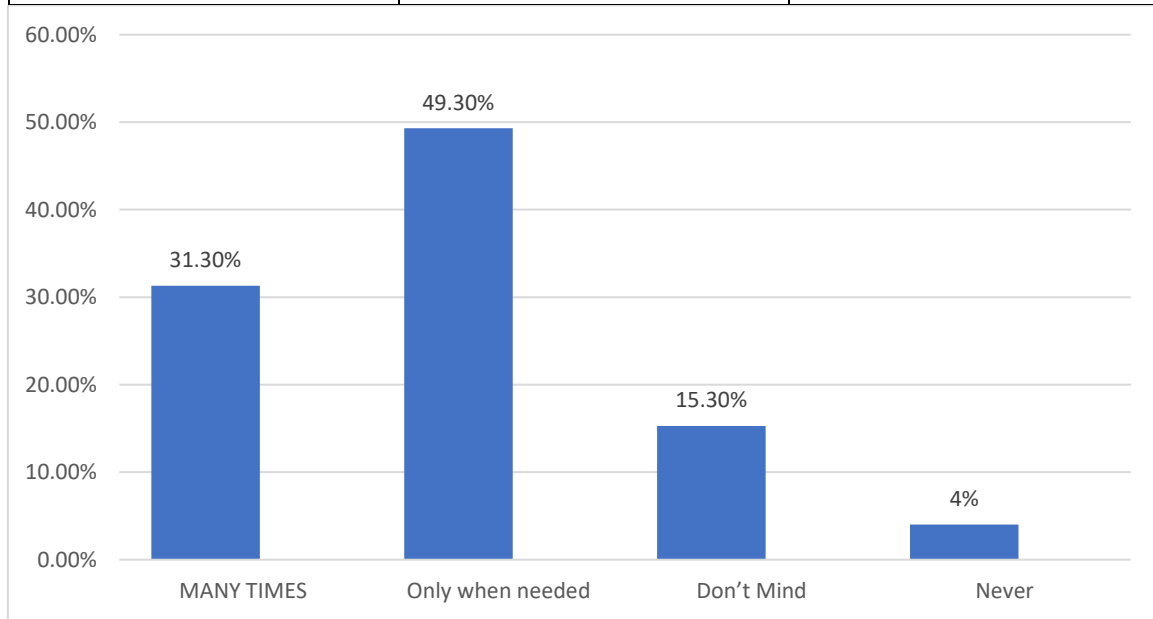


Chart 4.1.3 Respondents of times do you sanitizing your hand

Source : Primary data

INTERPRETATION

From the above table it's interpreted that there are 31.3% of people who sanitize their hand many times , 49.3% of people who sanitize their only when needed , 15.35 of people who don't mind about sanitizing their hand and 4% of people who never sanitize their hand

INFERENCE

- ❖ The majority of sanitize their hand only when needed (49.3%) among the 150 responses

Table 4.1.4 Respondents of thought about sanitizers would become your daily necessity

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
YES	87	58%
NO	45	30%
MAYBE	18	12%
TOTAL	150	100%

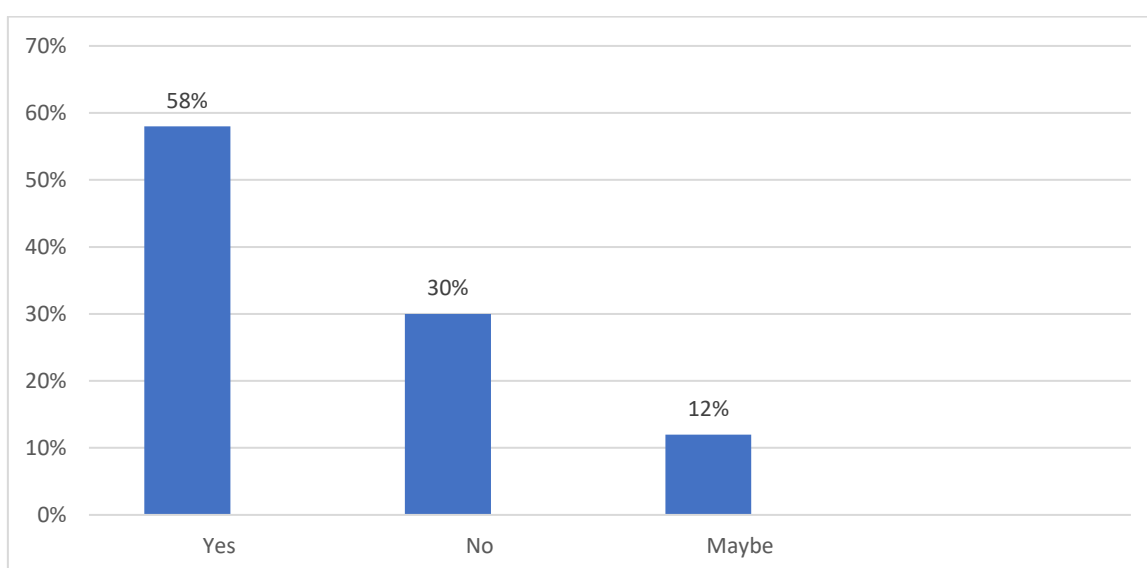


Chart 4.1.4 Respondents of thought about sanitizers would become your daily necessity

Source : Primary data

INTERPRETATION :

From the above data people who think sanitizers would become daily necessity yes is 58% and no is 30% and maybe is 12% of people among the 150 responses

INFERENCE

- ❖ From the above data it is show people were aware of sanitizers even before covid-19 is 58% among 150 responses

Table 4.1.5 Respondents of preference of hand sanitizers with (or) without Alcohol

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
WITH ALCOHOL	49	32.7%
WITHOUT ALCOHOL	73	48.7%
NEVER MIND	28	18.7%
TOTAL	150	100%

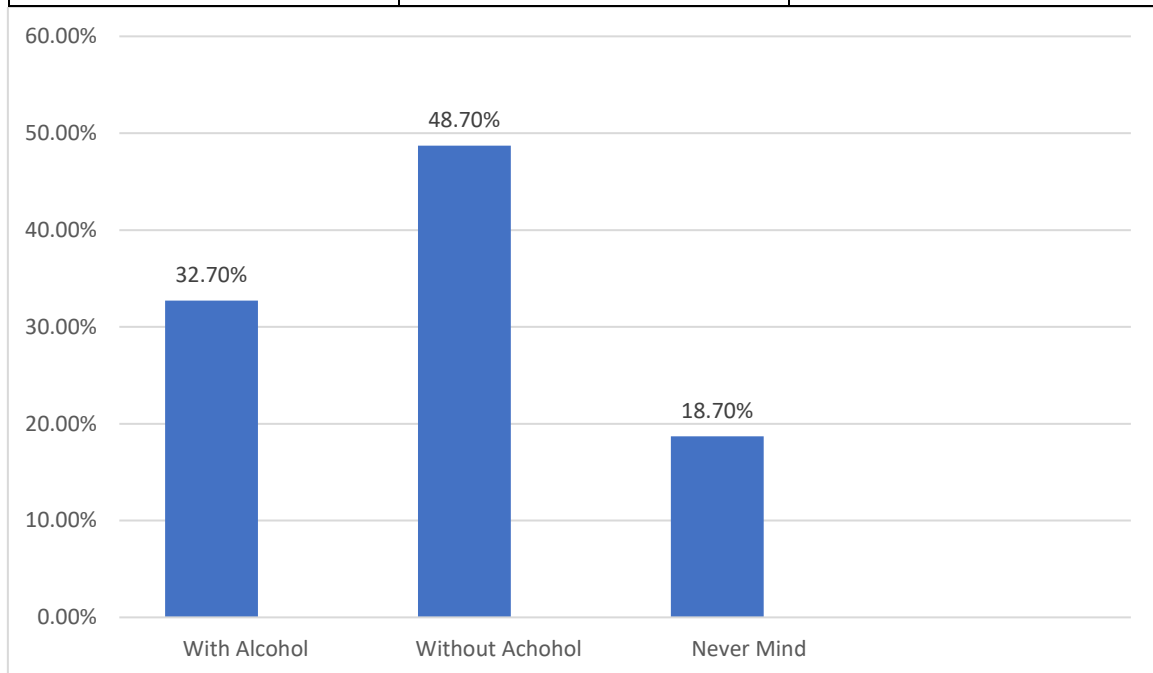


Chart 4.1.5 Respondents of preference of hand sanitizers with (or) without Alcohol

Source : Primary Data

INTERFERENCE

From the above data is interpreted that people who prefer sanitizer with alcohol is 32.7% and people who prefer hand sanitizers without alcohol is 48.7% and never mind about the ingredient is 18.7% of people among the 150 responses

INFERENCE

- ❖ The majority (48.7%) of the people prefer hand sanitizers without alcohol

Table 4.1.6 Respondents of preference of hand sanitizers for babies below 5 years of age

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
YES	49	32.7%
NO	101	67.3%
TOTAL	150	100%

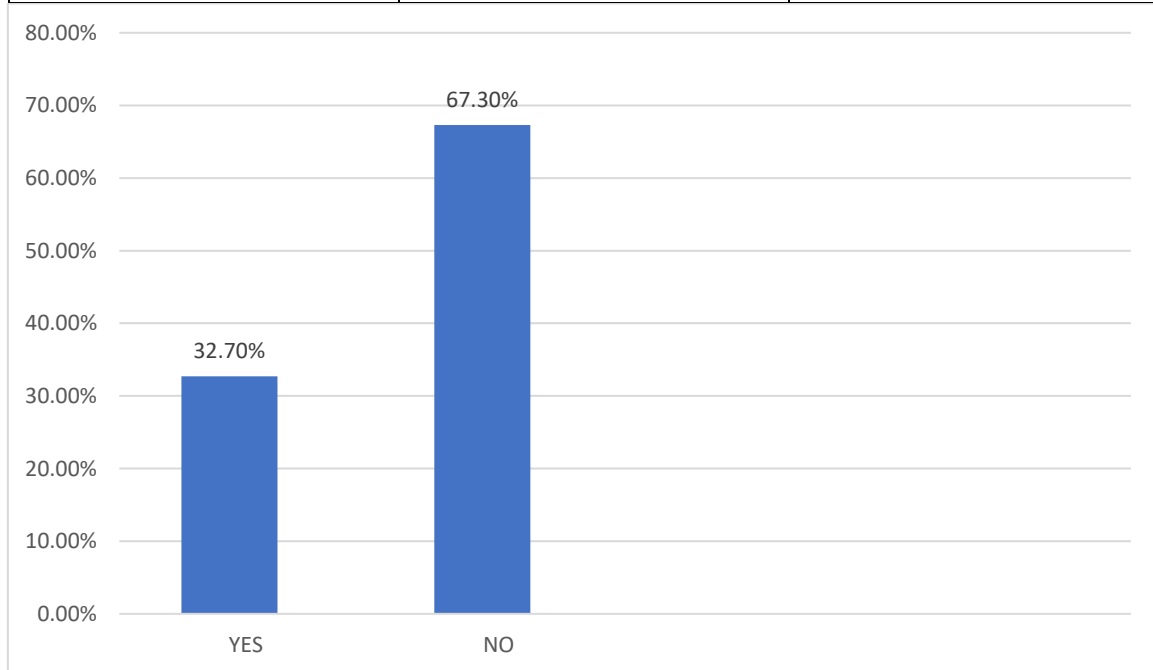


Chart 4.1.6 Respondents of preference of hand sanitizers for babies below 5 years of age

Source : Primary data

INTERPRETATION

From the above table it is interpreted that people who suggest hand sanitizers for people less than 5 is 32.7% and people who do not suggest hand sanitizers for babies less than 5 is 67.3%

INFERENCE

- ❖ The majority of Responses is (67.3%) that's no, hand sanitizers for babies below 5 years of age

Table 4.1.7 Respondents of Covid-19 Impacting The Demand For Hand Sanitizers In day to day life

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
VERY LOW	55	36.7%
LOW	52	34.7%
NETURAL	33	22%
HIGH	5	3.3%
VERY HIGH	5	.3%
TOTAL	150	100%

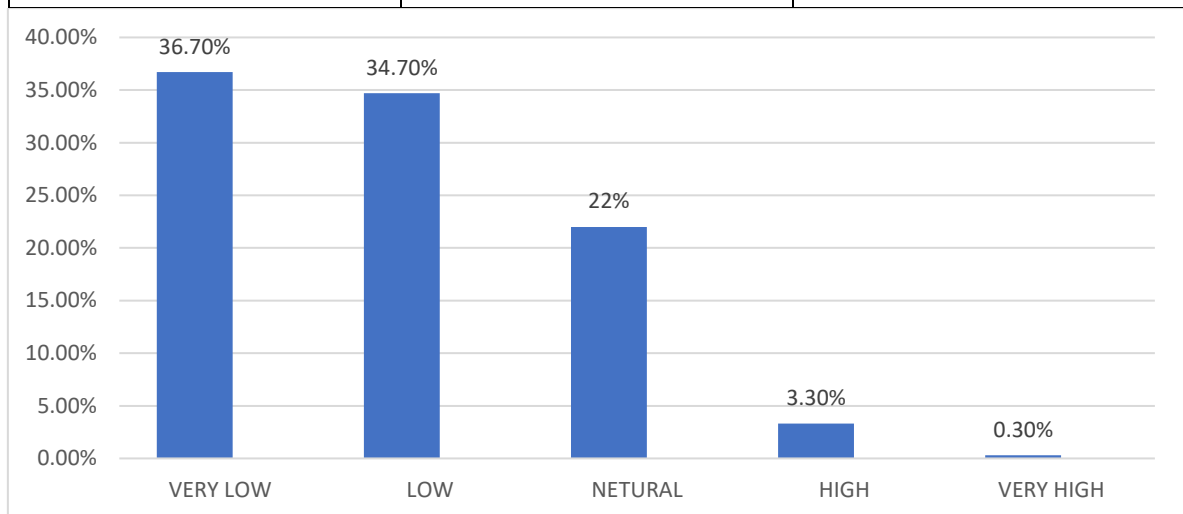


Chart 4.1.7 Respondents of Covid-19 Impacting The Demand For Hand Sanitizers In day to day life

Source : Primary data

INTERPRETATION

From the above table it is interpreted that the covid-19 is impacting the demand for hand sanitizer is very low is 36.7% and low is 34.7% neutral is 22% and high is 3.3% and very high is .3%

INFERENCE

- ❖ The majority of the responses is (36.7%) which is very low that covid-19 is impacting the demand for hand sanitizers in your life.

Table 4.1.8 Respondents Percentage Of People Believing Sanitizers Is Necessary During Covid 19

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
STRONGLY BELIEVE	81	54%
BELIEVE	44	29.3%
STRONGLY DISBELIEVE	25	16.7%
TOTAL	150	100%

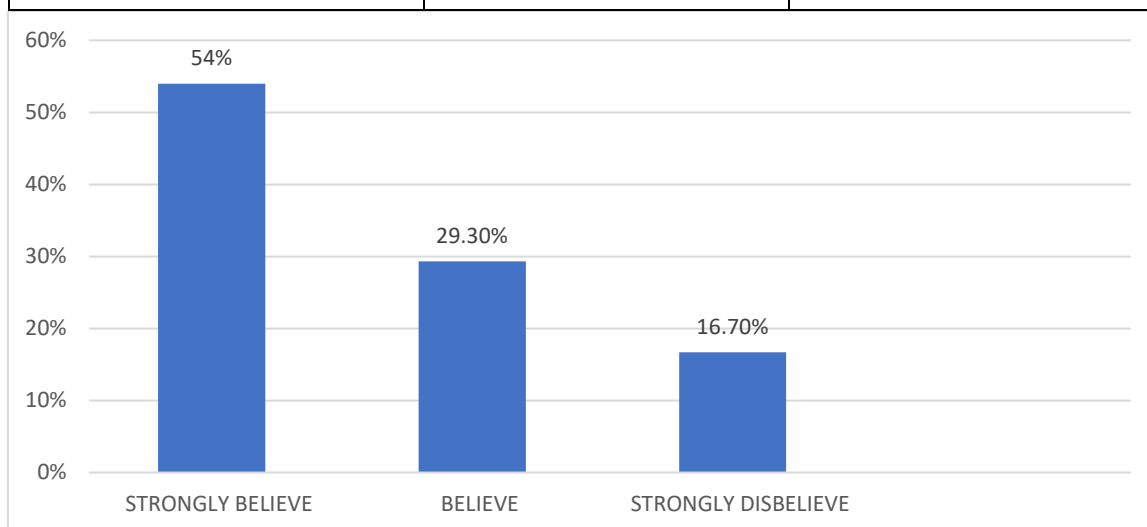


Chart 4.1.8 Respondents Percentage Of People Believing Sanitizers Is Necessary During Covid 19

Source : Primary data

INTERPRETATION

From the above table it is interpreted that people who strongly believe sanitizers is necessary during covid-19 is 54% and who believe is 29.3% and strongly disbelieve is 16.7%

INFERENCE

- ❖ The majority of the responses is 54% for strongly believe that sanitizers are necessary during covid-19
- ❖ The minority of the responses is 16.7% for strongly disbelieve that sanitizers are necessary during covid-19

Table 4.1.9 Percentage of Respondents Agree Sanitizers Is Better Than Washing Hands With Soap And Water

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
STRONGLY AGREE	59	39.3%
AGREE	58	38.7%
DIS AGREE	25	16.7%
STRONGLY DISAGREE	8	5.3%
TOTAL	150	100%

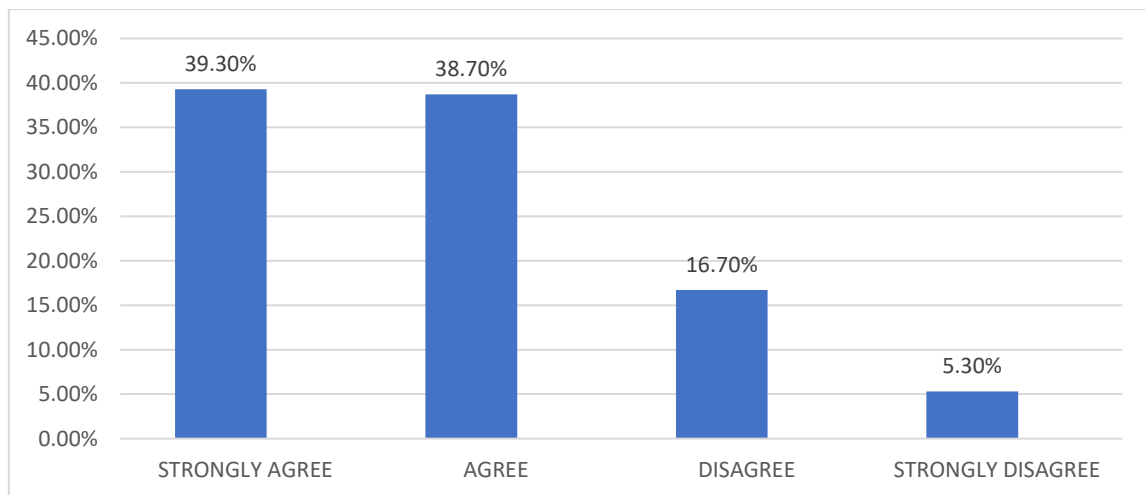


Chart 4.1.9 Percentage of Respondents Agree Sanitizers Is Better Than Washing Hands With Soap And Water

Source : Primary data

INTERPRETATION

From the above table it is interpreted people who strongly agree for sanitizers is better the soap and water is 39.3% who agree is 38.7% and who disagree is 16.7% who strongly disagree is 5.3%.

INFERENCE

- ❖ The majority is 39.3% who strongly agree sanitizers is better than soap and wate

Table 4.1.10 Percentage of Respondents Agree Sanitizers Kill All Bacteria And Virus

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
STRONGLY AGREE	60	40%
AGREE	52	34.7%
DIS AGREE	23	15.3%
STRONGLY DISAGREE	15	10%
TOTAL	150	100%

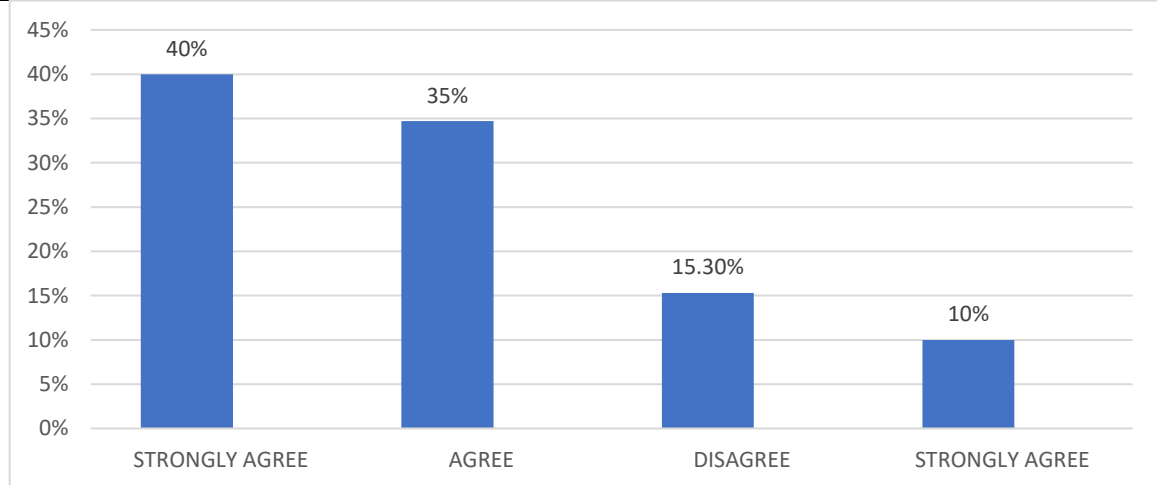


chart 4.1.10 Percentage of Respondents Agree Sanitizers Kill All Bacteria And Virus

SOURCE : PRIMARY DATA

INTERPRETATION

From the above table it is interpreted people who strongly agree that sanitizers kill bacteria and virus is 40% and agree is 34.7% and disagree is 15.3% and strongly disagree is 10%

INFERENCE

- ❖ The majority is strongly agree for sanitizes would kill virus and bacteria is 40%
- ❖ The minority is strongly disagree for sanitizers would kill virus and bacteria is 10%

Table 4.1.11 Respondents of Most preferred attributes in hand sanitizers

PARTICULARS	NO OF RESPONSES	PERCENTAGE
PRICE	23	15.3%
FRAGRANCE	52	34.6%
Germs Killing Capacity	31	20.6%
BRAND	44	29.3%

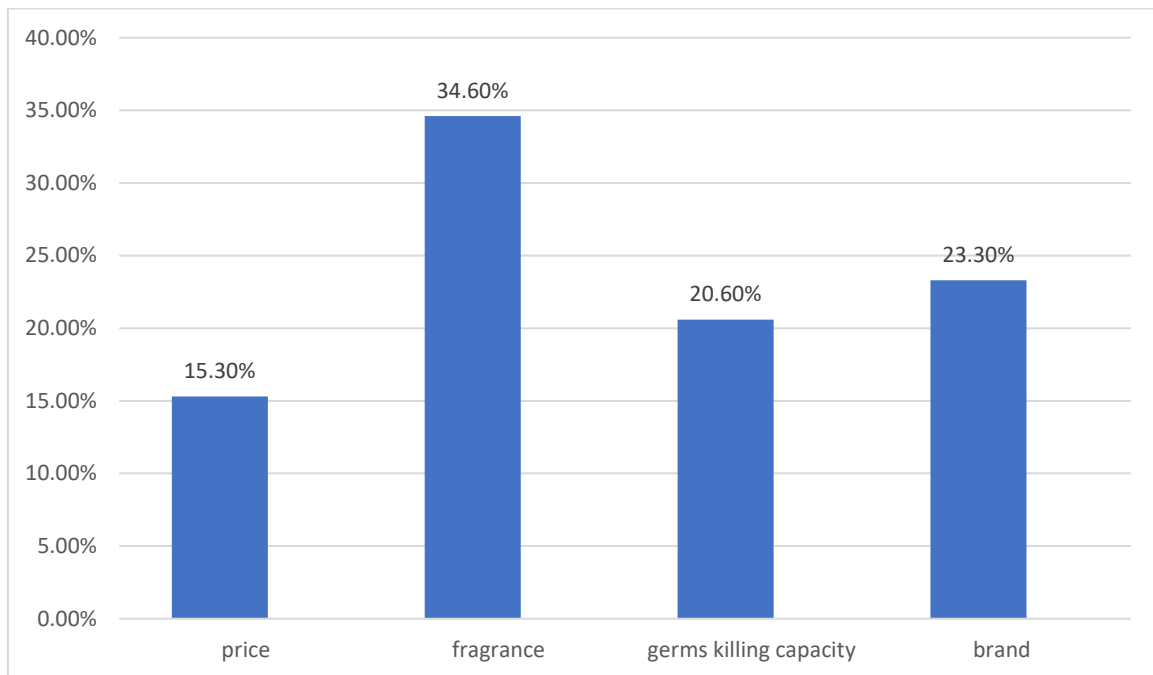


Chart 4.1.11 Respondents of Most preferred attributes in hand sanitizers

Source : Primary Data

INTREPRETATION

From the above data it is interpreted that the price preferred respondents is 15.3% , the fragrance preferred respondents are 34.6% , the germs killing capacity of the sanitizers preferred respondents are 20.6% and the brand preferred respondents are 23.3% .

INFERENCE

- ❖ The maximum (34.6%) fragrance is the most preferred attribute in sanitizers.

Table 4.1.12 Percentage of Respondents checking drug factor panel

PARTICULARS	NO. OF REPONSES	PERCENTAGE
YES	89	59.3%
NO	61	40.7%
TOTAL	150	100%

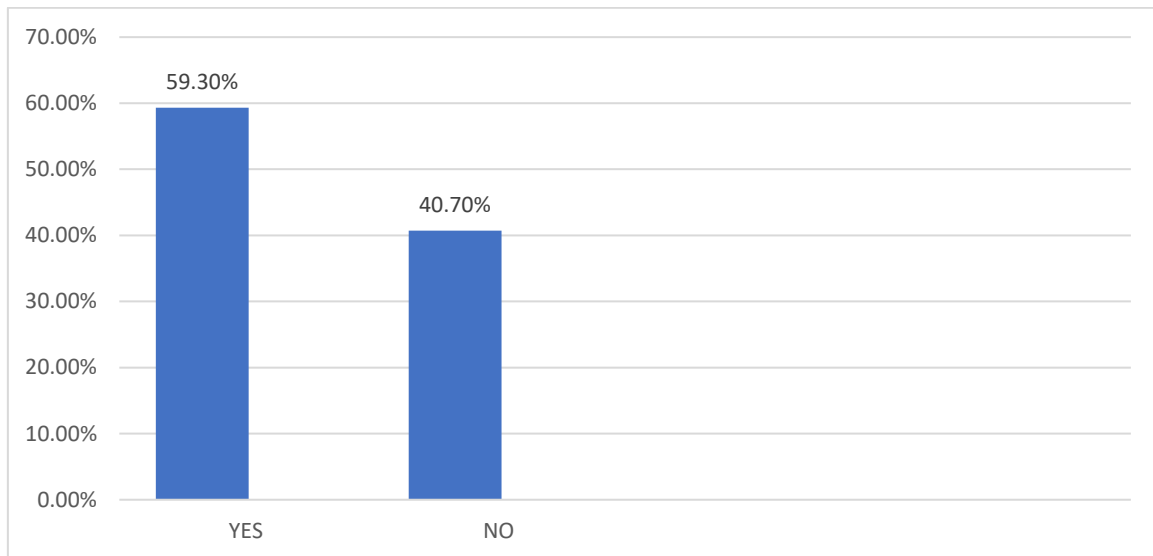


Chart 4.1.12 Percentage of Respondents checking drug factor panel

Source : Primary data

INTERPRETATION

From the above table it is interpreted the percentage of people among 150 responses it says that 59.3% of people checks the drug factor panel in the sanitizers and 40.7% of people don't check the drug factor panel in the sanitizers .

INFERENCE

- ❖ The majority of the people checks the drug factor panel which is 59.3%

Table 4.1.13 Percentage of Respondents Prefer Hand Sanitizer With Fragrance

PARTICULARS	NO. OF REPOSES	PERCENTAGE
YES	76	50.7%
NO	74	49.3%
TOTAL	150	100%

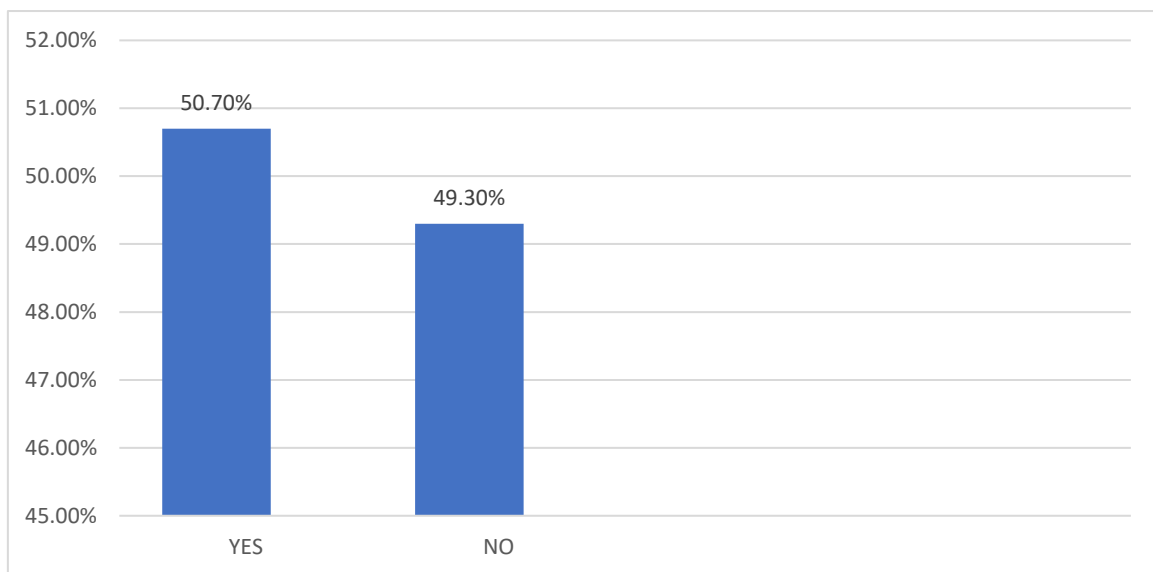


Chart 4.1.13 Percentage of Respondents Prefer Hand Sanitizer With Fragrance

Source : Primary data

INTERPRETATION :

From the above table it is interpreted that people who prefer hand sanitizer with fragrance is 49.3% and who do not suggest hand sanitizer is 50.7%

INFERENCE

- ❖ The Majority (50.7%) of the people prefer without fragrance

Table 4.1.14 Percentage of Respondents Preference Towards Branded And Non-Branded Sanitizers

Particulars	No. of responses	Percentage
BRANDED	62	39.3%
UNKNOWN BRAND	59	41.3%
NEVER MIND	29	19.3%
TOTAL	150	100%

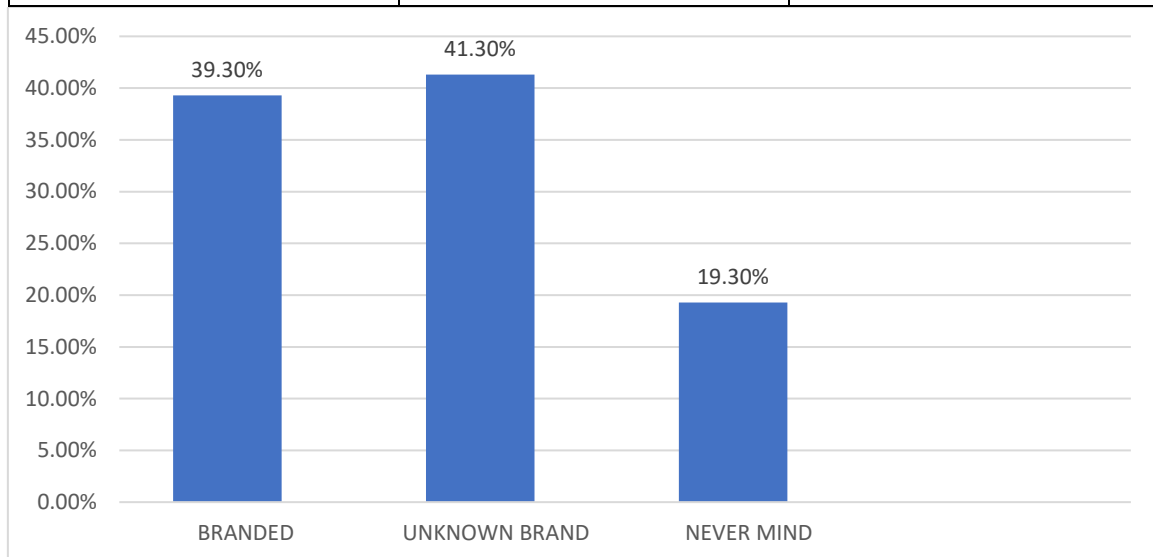


Chart 4.1.14 Percentage of Respondents Preference Towards Branded And Non-Branded Sanitizers

Source : Primary data

INTERPRETATION

From the above table it is interpreted the people who prefer branded is less than the people who prefer unknown brand is more the percentage of people who prefer branded sanitizer is 39.3% and the percentage of people who prefer unknown branded is 41.3% . there are 19.3% of people who do not mind about brand or non-branded

INFERENCE

- ❖ The majority (41.3%) is people who prefer unknown brand

Table 4.1.15 Percentage of Respondents Prefer Sanitizer Even After Covid-19

PARTICULARS	NO. OF RESONDANCE	PERCENTGE
YES	51	34%
NO	66	44%
MAYBE	33	22%
TOTAL	150	100

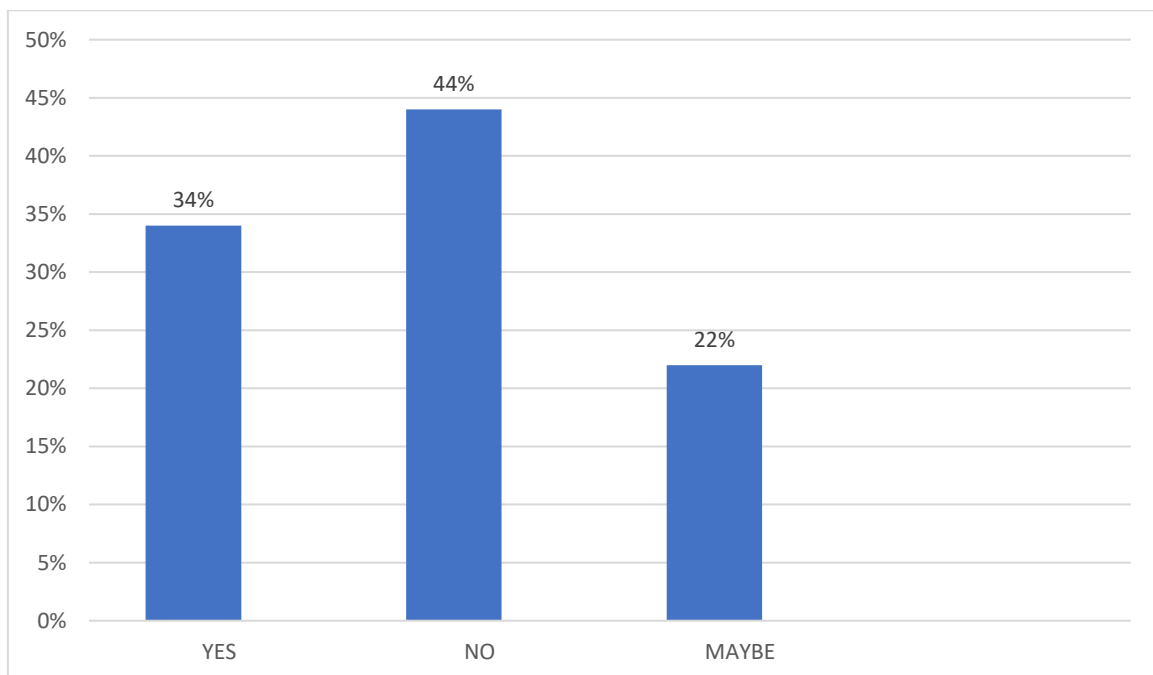


Chart 4.1.15 Percentage of Respondents Prefer Sanitizer Even After Covid-19

Source : Primary data

INTERPRETATION :

From the above table it is interpreted the people who prefer to use hand sanitizer even after covid-19 is less than the people who says no for sanitizers after covid-19 . The percentage of people who says yes is 34% maybe is 22% and No is 44% .

INFERANCE

- ❖ The majority (44%)of people says no for sanitizers after covi-19

Table 4.1.16 Percentage of Respondents Stays Towards The Same Brand

PARTICULARS	NO.OF RESPONDANCE	PERCENTAGE
YES	76	50.7
NO	74	49.3%
TOTAL	150	100%

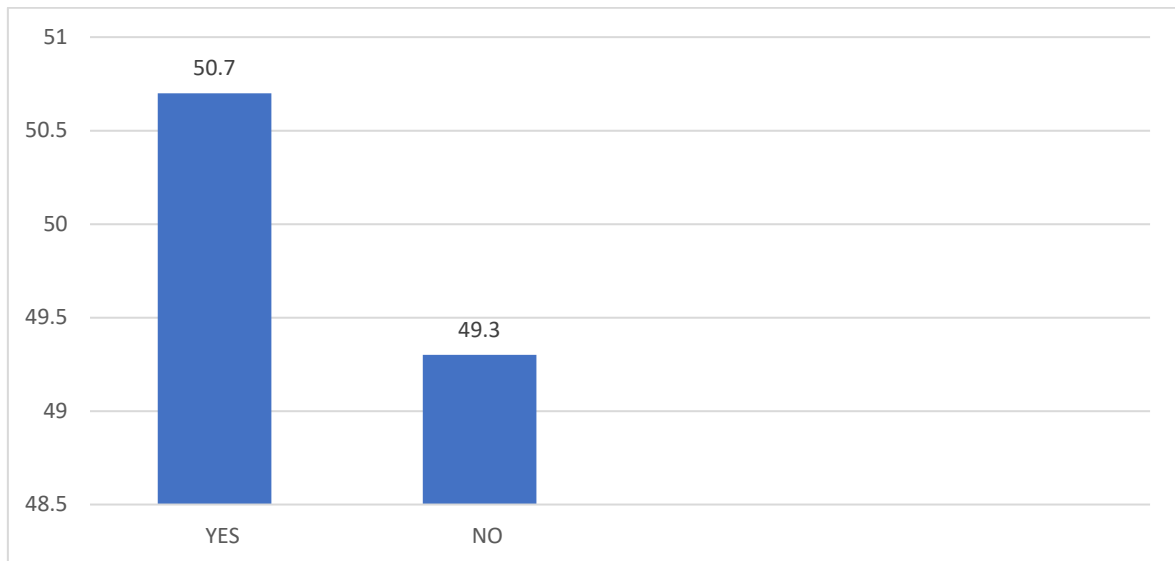


Chart 4.1.16 Percentage of Respondents Stays Towards The Same Brand

SOURCE : Primary data

INTERPRETATION

From the data it is interpreted that the people who stay towards same brand is more than that of the people who do not stay towards the same brand. The people who stay towards same brand percentage is 50.7% and the people who change the brand often is slightly low which is 49.3%.

INFERENCE

- ❖ The majority (50.7%) who stays towards the same brand of hand sanitizers

Table 4.1.17 Percentage of Respondents Agree Sanitizers Can Really Prevent You From Covid-19 Spread Through Hands

PARTICULARS	NO.OF RESPONDANCE	PERCENTAGE
STRONGLY AGREE	35	23.3%
AGREE	59	39.3%
DISAGREE	42	28%
STRONGLY DISAGREE	14	9.3%
TOTAL	150	100%

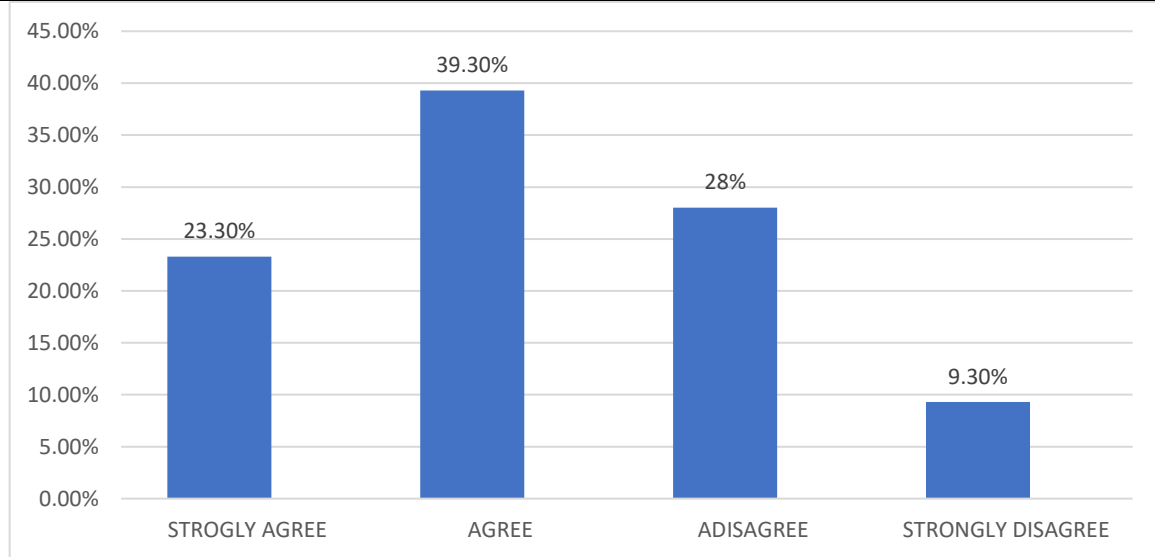


Chart 4.1.17 Percentage of Respondents Agree Sanitizers Can Really Prevent You From Covid-19 Spread Through Hands

Source : Primary data

INTERPRETATION

From the above table it is interpreted the people who strongly agree that sanitizers prevent from covid-19 spread through hand is 23.3% which is slightly less compared to people who agree for sanitizers prevent from covid-19 is 39.3% and the people who disagree is 23.3% and the people who strongly disagree is 9.3%

INFERENCE

- ❖ The maximum (39.3%) is agree that we can say that people who agree sanitizers prevent from covid-19 is more

Table 4.1.18 Percentage of Respondents use sanitizers kept in public places

PARTICULARS	NO. OF RESPONSES	PERCENTAGE
YES	68	45.3%
NO	58	35.3%
ONLYWHEN NECESSAY	29	19.3%
TOTAL	150	100%

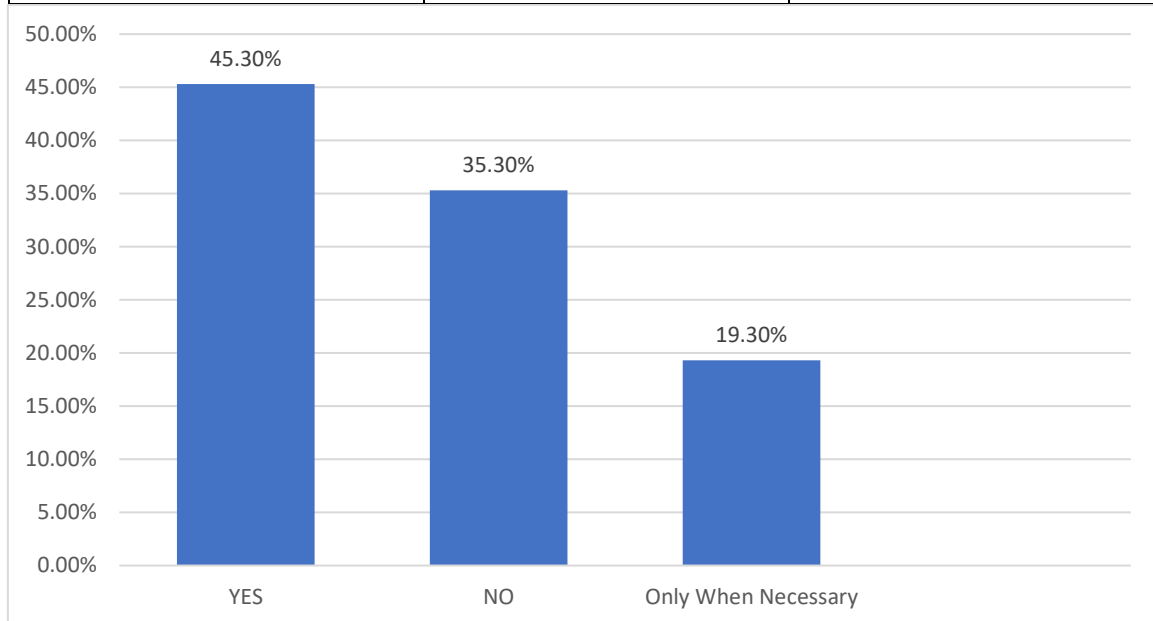


Chart 4.1.18 Percentage of Respondents use sanitizers kept in public places

Source : Primary data

INTERPRETATION

From the above table it is interpreted the people who use sanitizers kept in public place is 45.3% and 35.3% is no and the people who use sanitizers kept in public place only when needed is 19.3%

INFERENCE

- ❖ The maximum(45.3%) says yes that they use the sanitizers kept in the public places

Table 4.1.19 People preference for the quality of the factor of the product

Particulars	No of respondents			Percentage of respondent		
	High	Low	Moderate	High	Low	Moderate
Price	28	103	19	18.6	68.6	12.6
Brand	30	88	32	20	58.6	21.3
Fragrance	28	24	98	18.6	16	65.3
Germs killing capacity	113	16	21	75.3	10.6	14

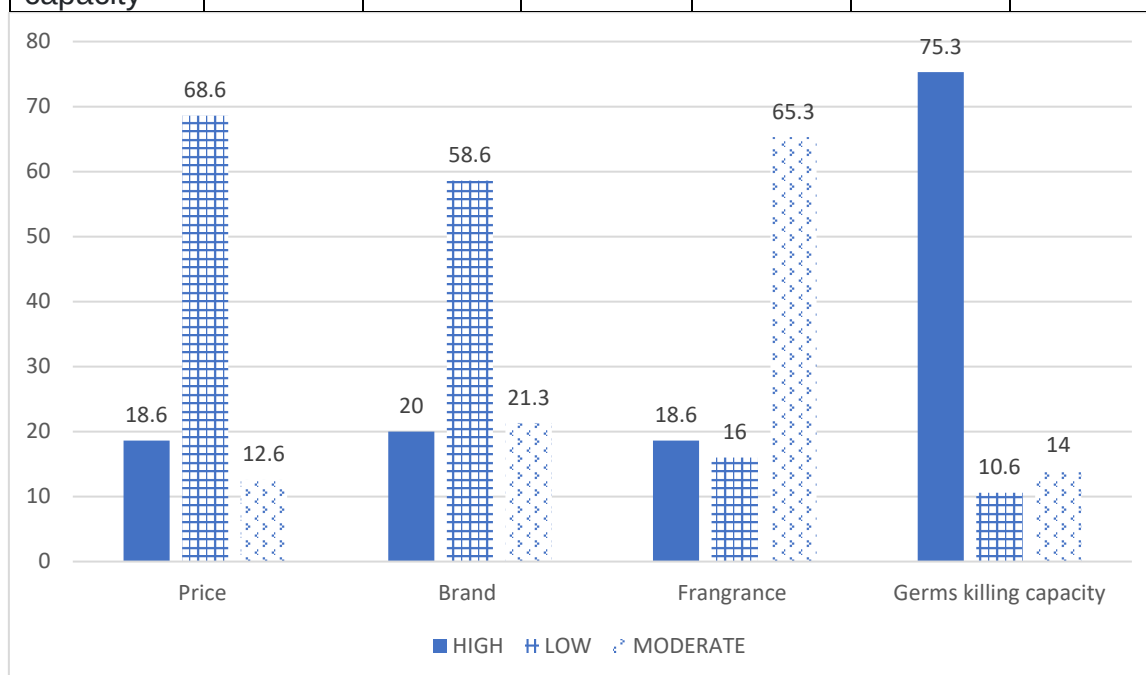


Chart 4.1.19 People preference for the quality of the factor of the product

Source : Primary Data

INTERPRETATION :

From the above data collected it is concluded that people low price hand sanitizers and fine low brand, choosing Fragrance is moderate and maximum of respondent choose high germs killing capacity in the hand sanitizers.

INFERENCE

- ❖ The maximum (68.6%) choose low price sanitizers, maximum (58.6%) choose low brand and sanitizers with moderate fragrance (65.3) and high germs killing capacity(75.3)

4.2 ANOVA

Analysis of variance (ANOVA) is a collection of statistical models and their associated estimation procedures (such as the "variation" among and between groups) used to analyse the differences among means. ANOVA is based on the law of total variance, where the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether two or more population means are equal, and therefore generalizes the t -test beyond two means.

The ANOVA tests the null hypothesis, which states that samples in all groups are drawn from populations with the same mean values. To do this, two estimates are made of the population variance. These estimates rely on various assumptions (see below). The ANOVA produces an F-statistic, the ratio of the variance calculated among the means to the variance within the samples. If the group means are drawn from populations with the same mean values, the variance between the group means should be lower than the variance of the samples, following the central limit theorem. A higher ratio therefore implies that the samples were drawn from populations with different mean values

Table : 4.2.1 ANOVA calculation whether there is a significant associate between the factors of the sanitizers and the age of the respondents

Null Hypothesis H_0 = There is no significant difference between The factors of the sanitizers and age of the respondents for selecting the product by the costumer

Alternate Hypothesis H_1 = there is significant difference between The factors of the sanitizers and the age of the respondents for selecting the product by the costumer

ANOVA

MODEL	Sum of Squares	Degree of Freedom	Mean sum of square	F calculated	F table
Between Groups	465.5	2	232.75	0.136142	Los : 0.05 (2,9) = 4.26
Within Groups	15386.5	9	1709.611		
Total	15852	11			

Source : Primary Data

INTERPRETATION:

F calculated (0.13) is lesser than that of the F table (4.26) value therefore there is a statistical relationship between the factors of the sanitizers and age of the respondents are dependent for selecting the product by the costumer

Table 4.2.2 ANOVA calculation whether there is a relationship between the gender and the believe over the sanitizers prevent from Covid-19

Null Hypothesis H_0 = There is no significance difference with respect to gender and the believe over the sanitizers prevent from covid-19

Alternate Hypothesis H_1 = There is significance difference with respect to gender and the believe over the sanitizers prevent from covid-19

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>F crit</i>
Between Groups	520.5	3	173.5	3.352657	6.591382
Within Groups	207	4	51.75		
Total	727.5	7			

Source : Primary Data

INTERPRETATION:

From the above table it is interpreted that F value (3.352657) is less than that of the f crit (6.591382) , therefore there is significant There is significance difference with respect to gender and the believe over the sanitizers prevent from covid-19

4.3 Chi-Square

A chi-square statistic is one way to show a relationship between two categorical variables. In statistics, there are two types of variables: numerical (countable) variables and non-numerical (categorical) variables. The chi-squared statistic is a single number that tells you how much difference exists between your observed counts and the counts you would expect if there were no relationship at all in the population.

There are a few variations on the chi-square statistic. Which one you use depends upon how you collected the data and which hypothesis is being tested. However, all of the variations use the same idea, which is that you are comparing your expected values with the values you actually collect. One of the most common forms can be used for contingency tables:

Test statistics that follow a χ^2 distribution occur when the observations are independent and normally distributed, which assumptions are often justified under the central limit theorem. There are also χ^2 tests for testing the null hypothesis of independence of a pair of random variables based on observations of the pairs.

Table 4.3.1 : Table showing the associate between age of respondents and the preference for branded sanitizers

Null Hypothesis (H0) : There is no associate between age of respondents and the preference for branded sanitizers

Alternative Hypothesis (H1) : there is associate between age of respondents and the preference for branded sanitizers

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AGE * DO YOU PREFER BRANDED SANITIZERS OR OK WITH RANDOM UNKNOWN BRANDS	150	100.0%	0	0.0%	150	100.0%

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.247 ^a	6	.115
Likelihood Ratio	10.628	6	.101
N of Valid Cases	150		

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .97.

Source : Primary data

INTERFERENCE :

Since p value is higher than 0.05 , we accept the Null hypothesis and reject the Alternate hypothesis. Therefore, there is no association between age of respondents and the preference for branded sanitizers

CHAPTER 5

5.1 FINDINGS

1. The majority (52.7%) of the responses is female
2. The Majority (64%) of the responses are from the age group 16-25
3. The Majority (49.3%) of people sanitize their hand only when needed
4. The Majority (58%) people were aware of sanitizers even before covid-19
5. The majority (48.7%) of the people prefer hand sanitizers without alcohol
6. The majority (67.3%) that's no, hand sanitizers for babies below 5 years of age
7. The majority (36.7%) which is very low that covid-19 is impacting the demand for hand sanitizers in your life.
8. The majority (54%) for strongly believe that sanitizers are necessary during covid-19
9. The minority (16.7%) for strongly disbelieve that sanitizers are necessary during covid-19
10. The majority is (39.3%) who strongly agree sanitizers is better than soap and water
11. The majority (40%) is strongly agree for sanitizers would kill virus and bacteria
12. The minority (10%) is strongly disagree for sanitizers would kill virus and bacteria
13. The majority of the people checks the drug factor panel which is 59.3%
14. The majority (41.3%) is people who prefer unknown brand
15. The majority (44%) of people says no for sanitizers after covid-19
16. The majority (50.7%) who stays towards the same brand of hand sanitizers
17. The maximum (39.3%) is agree that we can say that people who agree sanitizers prevent from covid-19 is more
18. The maximum (45.3%) says yes that they use the sanitizers kept in the public places
19. The maximum (68.6%) choose low price sanitizers , maximum (58.6%) choose low brand and sanitizers with moderate fragrance (65.3) and high germs killing capacity (75.3)

5.5 SUGGESTION :

- The overall experience of the states that more percentage of people among the overall population of the study it is concluded that the people were of aware of the sanitizers which shows their awareness towards their personal hygiene .
- The research have fond that majority of the people believe that the sanitizers helps them to prevent from the corona virus and sanitizers are really good at killing virus and bacteria's
- From the above data collected for the research purposes it conclude that there is significance relationship between gender and the believe over the sanitizers , Age of the respondent is related with the prefer of the respondent on selecting the sanitizers in the market , the personality of the consumers is related with the preference of the product
- From the research conducted that majority of the people who are are highly in usage of sanitizer only after the spread of covid-19

5.3 CONCLUSION

The sanitizers are the fast moving product in day to day life , even sanitizers have met the demand in Chennai by 2019 July . There is a high raise in the market of sanitizers . This research helps to Identify the behavior that people have about using hand sanitizers after covid-19 . and it gave a clear conclusion about the attribute that people consider when choosing to use hand sanitizers. And helps in knowing the respondents believe towards the hand sanitizer during the covid-19 .

REFERENCES

- “6 Things About Hand Sanitizers,” Berkeley Wellness, University of California, Berkeley (September 8, 2014), accessed March 17, 2015.
- “Commission Regulation (EU) No 358/2014 of 9 April 2014 Amending Annexes II and V to Regulation (EC) No 1223/2009 of the European Parliament and of the Council on Cosmetic Products,” *Official Journal of the European Union* L 107 (10 April 2014), accessed April 28, 2015.
- Ahmed, K, Ahmed, H, Ahmed, FA, . Analysis of anti-microbial and anti-biofilm activity of hand washes and sanitizers against S. aureus and P. aeruginosa. J Pak Med Assoc. 2020;70(1):100–104
- Anoosh Moadab, Kathryn F. Rupley, and Peter Wadhams, “Effectiveness of a Nonrinse, Alcohol-Free Antiseptic Hand Wash,” *Journal of the American Podiatric Medical Association* 91, no. 6 (June 2001): 288–293, accessed March 17, 2015.
- Blaney DD, Daly ER, Kirkland KB, Tongren JE, Kelso PT, Talbot EA. Use of alcohol-based hand sanitizers as a risk factor for norovirus outbreaks in long-term care facilities in northern New England: December 2006 to March 2007. Am J Infect Control. 2011;39:296–301
- Blaney, D.D.; Daly, E.R.; Kirkland, K.B.; Tongren, J.E.; Kelso, P.T.; Talbot, E.A. Use of alcohol-based hand sanitizers as a risk factor for norovirus outbreaks in long-term care facilities in northern New England: December 2006 to March 2007. Am. J. Infect. Control 2011, 39, 296–301
- Boyce JM, Pittet D, Healthcare Infection Control Practices Advisory Committee. Society for Healthcare Epidemiology of America. Association for Professionals in Infection Control. Infectious Diseases Society of America. Hand Hygiene Task Force Guideline for hand hygiene in health-care settings: recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force. *Infect Control Hosp Epidemiol.* 2002;23(12 Suppl):S3–40.

- Centers for Disease Control and Prevention. Prevention of Coronavirus Disease 2019 (COVID-19). Available online: <https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html> (accessed on 8 May 2020).
- Centers for Disease Control and Prevention. Chemical Disinfectants—Guideline for Disinfection and Sterilization in Healthcare Facilities; Centers for Disease Control and Prevention: Atlanta, GA, USA, 2016.
- Centers for Disease Control and Prevention. Hand Hygiene in Healthcare Settings; Centers for Disease Control and Prevention: Atlanta, GA, USA, 2019.
- Compounding Expert Committee. Compounding Alcohol-Based Hand Sanitizer during COVID-19 Pandemic. Available online : <https://www.usp.org/sites/default/files/usp/document/about/public-policy/usp-covid19-handrub.pdf> (accessed on 8 May 2020).
- Coronavirus disease 2019 (COVID-19) Situation Report-101. 2020. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200430-sitrep-101-covid-19.pdf?sfvrsn=2ba4e093_2. Accessed July 10,2020.
- Curtis, V . Talking dirty: how to save a million lives. *Int J Environ Health Res* 2003; 13(Suppl 1): S73–S79
- David, LD, Kenneth, BG, Peter, SW. Testing a new alcohol-free hand sanitizer to combat infection. *AORN J* 1998; 68(2): 239–251. Accessed March9, 2015.
- Ejemot, R, Ehiri, J, Meremikwu, M, . Hand washing for preventing diarrhoea. *Cochrane Database Syst Rev* 2008; 23: CD004265.
- Elaine L. Larson, Bevin Cohen, and Kathleen A. Baxter, “Analysis of Alcohol-Based Hand Sanitizer Delivery Systems: Efficacy of Foam, Gel, and Wipes Against Influenza A (H1N1) Virus on Hands,” *American Journal of Infection Control* 40, no. 9 (November 2012): 806–809, accessed March 18, 2015.
- Fleur P la, Jones S. Non-alcohol based hand rubs: a review of clinical effectiveness and guidelines [Internet]. *CADTH Rapid Response Report*. 2017. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/29266912>. Accessed July 10, 2020
- Fleur P la, Jones S. Non-alcohol based hand rubs: a review of clinical effectiveness and guidelines [Internet]. *CADTH Rapid Response Report*. 2017.

Available at: <http://www.ncbi.nlm.nih.gov/pubmed/29266912>. Accessed July 10, 2020

- Foddai ACG, Grant IR, Dean M. Efficacy of instant hand sanitizers against foodborne pathogens compared with hand washing with soap and water in food preparation settings: A systematic review. *J Food Prot.* 2016;79:1040–1054. International Association for Food Protection.
- Food and Drug Administration; HHS. Safety and Effectiveness of Health Care Antiseptics; Topical Antimicrobial Drug Products for Over-the-Counter Human Use. Final Rule. Available online : <https://www0.fda.gov/media/109956/download> (accessed on 8 May 2020).
- Fung ICH, Cairncross S. Effectiveness of handwashing in preventing SARS: a review. *Trop Med Int Health.* 2006;11:1749–1758.
- Gerberding, J.L.; Fleming, M.W.; Snider, D.E., Jr.; Thacker, S.B.; Ward, J.W.; Hewitt, S.M.; Wilson, R.J.; Heilman, M.A.; Doan, Q.M. Morbidity and Mortality Weekly Report Guideline for Hand Hygiene in Health-Care Settings; Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force; Centers for Disease Control: Atlanta, GA, USA, 2002; Volume 51
- Graham, M.; Nixon, R.; Burrell, L.J.; Bolger, C.; Johnson, P.D.R.; Grayson, M.L. Low rates of cutaneous adverse reactions to alcohol-based hand hygiene solution during prolonged use in a large teaching hospital. *Antimicrob. Agents Chemother.* 2005, 49, 4404–4405
- Greenaway, R.E.; Ormandy, K.; Fellows, C.; Hollowood, T. Impact of hand sanitizer format (gel/foam/liquid) and dose amount on its sensory properties and acceptability for improving hand hygiene compliance. *J. Hosp. Infect.* 2018, 100, 195–201.
- Greenaway, RE, Ormandy, K, Fellows, C, . Impact of hand sanitizer format (gel/foam/liquid) and dose on its sensory properties. *J Hosp Inf* 2018; 2: 411–416.
- Jain, VM, Karibasappa, GN, Dodamani, AS, Prashanth, VK, Mali, GV. Comparative assessment of antimicrobial efficacy of different hand sanitizers: an in vitro study. *Dent Res J (Isfahan)* 2016; 13(5): 424–431.

- Kaltenthaler, EC, Drasar, BS. The study of hygiene behaviour in Botswana: a combination of qualitative and quantitative methods. *Trop Med Int Health* 1996; 1: 690–698.
- Kaltenthaler, EC, Pinfold, JV. Microbiological methods for assessing handwashing practice in hygiene behaviour studies. *J Trop Med Hyg* 1995; 98: 101–106.
- Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect.* 2020;104:246–251. W.B. Saunders Ltd
- Kampf, G.; Kramer, A. Epidemiologic background of hand hygiene and evaluation of the most important agents for scrubs and rubs. *Clin. Microbiol. Rev.* 2004, 17, 863–893
- Kotia, P, Gupta, BD, Gupta, R, . Comparing the antimicrobial efficacy of different hand sanitizers: an in vitro study. *J Ind Assoc Pub Health Dent* 2019; 17: 253–257
- Larson, EL, Cohen, B, Baxter, KA. Analysis of alcohol-based hand sanitizer delivery systems: efficacy of foam, gel, and wipes against influenza a (H1N1) virus on hands. *Am J Infect Contr* 2012; 40(9): 806–809. Accessed March18, 2015.
- McDonnell G, Russell AD. Antiseptics and disinfectants: activity, action, and resistance. *Clin Microbiol Rev.* 1999;12:147–179. American Society for Microbiology (ASM)
- Moadab, A, Rupley, KF, Wadhams, P. Effectiveness of a nonrinse, alcohol-free antiseptic hand wash. *J Am Pediatr Med Assoc* 2001; 91(6): 288–293. Accessed March17, 2015.
- Notification on: Monitoring of quality standards of hand sanitizers as per drugs and cosmetics act 1940, and rules made thereunder and expediting the licensing of manufacturers of such products (2020) Government of India, Directorate General of Health Services, Central Drugs Standard Control Organization, New Delhi, India: FDA Bhawan, Available at <https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/d...> (Accessed on April 12, 2020).

- Ochwoto, M, Muita, L, Talaam, K, . Anti-bacterial efficacy of alcoholic hand rubs in the Kenyan market, 2015. *Antimicrob Resist Infect Contr* 2017; 6: 17
- Oughton, M.T.; Loo, V.G.; Dendukuri, N.; Fenn, S.; Libman, M.D. Hand Hygiene with Soap and Water Is Superior to Alcohol Rub and Antiseptic Wipes for Removal of *Clostridium difficile*. *Infect. Control Hosp. Epidemiol.* 2009, 30, 939–944
- Pickering, AJ, Boehm, AB, Mwanjali, M, . Efficacy of waterless hand hygiene compared with handwashing with soap: a field study in Dar es Salaam, Tanzania. *Am J Trop Med Hyg* 2010; 82(2): 270–278.
- Pittet D, Allegranzi B, Boyce J. The World Health Organization guidelines on hand hygiene in health care and their consensus recommendations. *Infect Control Hosp Epidemiol.* 2009;30:611–622
- Pittet, D . Improving adherence to hand hygiene practice: a multidisciplinary approach. *Emerg Infect Dis* 2001; 7: 234–240
- Policy for temporary compounding of certain alcohol-based hand sanitizer products during the public health emergency immediately in effect guidance for industry. U.S. Department of Health and Human Services. Food and Drug Administration, Center for Drug Evaluation and Research (CDER), March 2020. Available at <https://www.fda.gov/media/136118/download> (Accessed on April 6, 2020)
- Raymond Li, “Alcohol-Based Hand Sanitizer Safety,” B.C. Drug and Poison Information Centre (2010), accessed March 11, 2015.
- Shulman, L . Hand sanitizer: benefits & limitations. *Canadian Living: Prevention & Recovery*; Nov 10, 2006.
- Simmone, A . Hand hygiene and hand sanitizers. A series from the Family Youth and Community Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Publication no. FCS8788; March 2011. Accessed March9, 2015.
- Vemeil, T, Peter, A, Kelpatick, C, . Hand hygiene in hospitals: anatomy of a revolution. *J Hosp Inf* 2018; 1: 320–327.
- WHO Guidelines on Hand Hygiene in Health Care (Advanced Draft) Global Patient Safety Challenge 2005–2006. (2009). *Clean Care is Safer Care*, 2009. Geneva, Switzerland: WHO Press; Available

at https://www.who.int/patientsafety/information_centre/Last_April_versionH... (Accessed on April 4, 2020).

- William M. Cavage, "Flammability Test of Alcohol-Based Hand Sanitizer," technical note, report no. DOT/FAA/AR-TN10/19, National Technical Information Service (NTIS), Springfield, Virginia (August 2010), accessed March 26, 2015.
- World Health Organisation. WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge: Clean Care Is Safer Care; World Health Organisation: Geneva, Switzerland, 2009
- World Health Organization, "Alcohol-Based Handrub Risks/Hazards," information sheet from the Clean Care Is Safer Care campaign (2015), accessed March 26, 2015.
- World Health Organization. Guide To Local Production: Who-Recommended Handrub Formulations; World Health Organisation: Geneva, Switzerland, 2015.

APPENDIX – I (Questionnaire)

1) Age (years)

- a) below 15 b) 16-25 c) 26-35 d) above 35

2) Gender

- a) male b) female

3) How Many Times Do You Sanitize Your Hand

- a) many times b) only when needed c) don't mind d) never

4) Before Covid-19 Do You Think Sanitizers Would Become A Daily Necessity

- a) yes b) no c) maybe

5) Do You Prefer Hand Sanitizers With (Or) Without Alcohol

- a) with alcohol b) without alcohol c) never mind

6) Do You Prefer Hand Sanitizers For Babies Below 5 Years Of Age

- a) yes b) no

7) How Is Covid-19 Impacting The Demand For Hand Sanitizers In Your Life

- a) very low b) low c) neutral d) high d) very high

8) Do You Believe Sanitizers Is Necessary During Covi-19

- a) strongly believe b) believe c) strongly disbelieve d) disbelieve

9) do you agree sanitizers is better than washing hands with soap and water

- a) strongly believe b) believe c) strongly disbelieve d) disbelieve

10) Do you agree sanitizers kill all bacteria and virus

- a) strongly believe b) believe c) strongly disbelieve d) disbelieve

11) Do You Check Hand Sanitizers Label Have A Drug Factor Panel

- a) yes b) no

12) Do You Prefer Hand Sanitizers With Fragrance

- a) yes b) no

13) The Most Preferred Attribute In Hand Sanitizer Is

- a) price b) fragrance c) germs killing capacity d) brand

14) Do You Prefer Branded Sanitizers Or Ok With Random Unknown Brands

- a) branded b) non-branded c) never mind

15) will you prefer sanitizers even after covid-19

- a) yes b) no c) maybe

16) Do You Stay Towards Same Brand

- a) yes b) no

17) Do You Agree Sanitizer Can Really Prevent You From Covid-19 Spread Through Hands

- a) strongly agree b) agree c) disagree d) strongly disagree

18) Do You Use Sanitizers Kept In Public Places

- a) yes b) no c) only when necessary

ARTICLE

A STUDY OF CONSUMER OPINION TOWARDS USE OF HAND SANITIZERS DURING COVID-19

DR.A PALANI M.COM ., MBA., M.Phil., Ph.D., at Sathyabama Institute Of
Science And Technology, Chennai

M. SANDHANA SILVIYA , School of Management studies , Sathayabama Institute
Of Science And Technology, Chennai

ABSTRACT

The project entitled the “ A STUDY ON CONSUMER OPINION TOWARDS USE OF HAND SANITIZER DURING COVID” has attempted to analyse the behaviour , believe and preference of hand sanitizers among the people during covid-19 . The study is fully based on the primary data collected among the general public. The collected data has been analysed using various statistical tools like percentage analysis and analysis of variance (ANOVA) and Chi-Square . After analysing the data, general specific findings are sought out through interpretation. Suggestions are formulated from the summary of findings. This study is been organised in six chapter .The first chapter includes general introduction, industry profile , The second chapter is Review of literature this is based on the famous authors view about the research methodology about sanitizers and the analysis about the hypothesis published in journals and books . The third chapter is research methodology which includes research design, sources of data and tools used for analysis. The fourth chapter is Data analysis and interpretations which includes charts and tables. The fifth chapter is Findings, suggestions and conclusions.

key words : sanitizers , consumer behaviour

INTRODUCTION

The above research paper is to study about the behavior of consumers in the period of covid towards the product Sanitizers . This research is solved using the tools ANOVA , CHI-SQUARE , Percentage analysis with the sample of 150 respondents . The main reasons of this paper is to understand the consumer behavior towards the product during the pandemic period . This paper is used to identify the attribute

that people consider when choosing to use hand sanitizers and control beliefs that makes people not believing sanitizers in covid-19

OBJECTIVES OF STUDY

The overall purpose of this study is to identify the cognitive stimulants and barriers of using hand sanitizers among people in the covid-19. Specific objectives include .

1. Identify the behavior that people have about using hand sanitizers after covid-19
2. Identify the attribute that people consider when choosing to use hand sanitizers
3. Identify the perceived behavioral control beliefs that makes people not believing sanitizers in covid-19

REVIEW OF LITERATURE

1. **Engel, (1986) define consumer behaviour** “Those acts of individuals directly involved in obtaining, using, and disposing of economic goods and services, including the decision processes that precede and determine these acts”
2. **Kotler (1994):**Consumer behaviour is the study of how people buy, what they buy, when they buy and why they buy.
3. **VOCAB BUILT :** Sanitizer is a substance or fluid designed to kill germs on skin and objects .Food service operations use sanitizer to clean their equipment so that food

SAMPLING TECHNIQUES

- To study the project the simple random sampling techniques under lottery method is used

SOURCE OF DATA

The two source of data collection are namely primary and secondary data

Primary data

- Primary data are collected through questionnaire .

Secondary data

- Secondary data are collected from books and internet

SAMPLE SIZE

- The population is indefinite . A sample of 150 respondent was taken into consideration for my study and the data was collected

DISCUSSIONS

On completing the project “ A study of consumer opinion towards use of hand sanitizers during covid-19 ” The overall experience of the states that more percentage of people among the overall population of the study it is concluded that the people were of aware of the sanitizers which shows their awareness towards their personal hygiene . From the above data collected for the research purposes it conclude that there is significance relationship between gender and the believe over the sanitizers , Age of the respondent is related with the prefer of the respondent on selecting the sanitizers in the market , the personality of the consumers is related with the preference of the product

RESULT :

ANOVA calculation whether there is a significant associate between the factors of the sanitizers and the range of the product for selecting by the costumer

Null Hypothesis HO = There is no significant difference between The factors of the sanitizers and the range of the product for selecting the product by the costumer

Alternate Hypothesis H1 = there is significant difference between The factors of the sanitizers and the range of the product for selecting the product by the costumer

ANOVA

MODEL	Sum of Squares	Degree of Freedom	Mean sum of square	F calculated	F table
Between Groups	465.5	2	232.75	0.136142	Los : 0.05 (2,9) = 4.26
Within Groups	15386.5	9	1709.611		
Total	15852	11			

INTERPRETATION:

F calculated (1.24) is lesser than that of the F table (4.26) value therefore there is a statistical relationship between the factors of the sanitizers and the rang of the product are dependent for selecting the product by the costumer

RESULT

ANOVA calculation whether there is a relationship between the gender and the believe over the sanitizers prevent from Covid-19

Null Hypothesis HO = There is no significance difference with respect to gender and the believe over the sanitizers prevent from covid-19

Alternate Hypothesis H1 = There is significance difference with respect to gender and the believe over the sanitizers prevent from covid-19

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>F crit</i>
Between Groups	520.5	3	173.5	3.352657	6.591382
Within Groups	207	4	51.75		
Total	727.5	7			

INTERPRETATION:

From the above table it is interpreted that F value (3.352657) is less than that of the f crit (6.591382) , therefore there is significant difference with respect to gender and the believe over the sanitizers prevent from covid-19

RESULT

Table showing the associate between age of respondents and the preference for branded sanitizers

Null Hypothesis (H0) : There is no associate between age of respondents and the preference for branded sanitizers

Alternative Hypothesis (H1) : there is associate between age of respondents and the preference for branded sanitizers

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AGE * DO YOU PREFER BRANDED SANITIZERS OR OK WITH RANDOM UNKNOWN BRANDS	150	100.0%	0	0.0%	150	100.0%

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.247 ^a	6	.115
Likelihood Ratio	10.628	6	.101
N of Valid Cases	150		

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .97.

INTERFERENCE :

Since p value is higher than 0.05 , we accept the alternate hypothesis and reject the null hypothesis. Therefore, there is an association between age of respondents and the preference for branded sanitizers

CONCULTION :

The sanitizers are the fast moving product in day to day life , even sanitizers have met the demand in Chennai by 2019 July . There is a high raise in the market of sanitizers . This research helps to Identify the behavior that people have about using hand sanitizers after covid-19 . and it gave a clear conclusion about the attribute that people consider when choosing to use hand sanitizers. And helps in knowing the respondents believe towards the hand sanitizer during the covid-19 .

SUGGESTION :

- The overall experience of the states that more percentage of people among the overall population of the study it is concluded that the people were of aware of the sanitizers which shows their awareness towards their personal hygiene .
- The research have fond that majority of the people believe that the sanitizers helps them to prevent from the corona virus and sanitizers are really good at killing virus and bacteria's

- From the above data collected for the research purposes it conclude that there is significance relationship between gender and the believe over the sanitizers , Age of the respondent is related with the prefer of the respondent on selecting the sanitizers in the market , the personality of the consumers is related with the preference of the product
- From the research conducted that majority of the people who are are highly in usage of sanitizer only after the spread of covid-19

Review of literature

- Curtis, V . Int J Environ Health Res 2003; 13(Suppl 1): S73–S79
- Ejemot, R, Ehiri, J, Meremikwu, M, . Hand washing for preventing diarrhoea.
- Fleur P la, Jones S. *CADTH Rapid Response Report*. 2017. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/29266912>. Accessed July 10, 2020
- Fleur P la, Jones S. *CADTH Rapid Response Report*. 2017. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/29266912>. Accessed July 10, 2020
- Foddai ACG, Grant IR, Dean. J Food Prot. 2016;79:1040–1054. International Association for Food Protection.