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# KNOWLEDGE, ATTITUDE, AND PRACTICE OF WEARING AND PROPER HANDLING OF GLOVES AMONG THE GENERAL POPULATION DURING THE COVID PANDEMIC-A CROSS-SECTIONAL STUDY

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## ABSTRACT

Healthcare authorities have generally advised against wearing gloves by the general population. However, the use of gloves has become a common sight in public places raising the question of the necessity of glove wearing practice by the general population. This study

aims to measure the awareness of wearing and proper handling of gloves during this covid pandemic. A survey was conducted through online survey tool called "Google forms" with 24 questionnaire. The results were analysed using the SPSS software. The study comprises 394 people , 54.8% and 42.2% were females and males of 3 different age groups. Majority of the individuals had awareness of wearing gloves during this pandemic with about 84.94% of female, 75.2% of male who agreed that wearing gloves during this pandemic is mandatory. A significant amount of people (32.7 %) used single-use gloves, while the rest used reusable gloves. About 42.23% used single use latex gloves and approximately 89.32% of individuals use reusable gloves for more than a month. Majority of individuals were aware that washing hands after removing gloves is mandatory (92.25 %).Based on our findings, we can infer that the people have a good understanding of wearing and proper handling of gloves during this COVID-19 pandemic.

**Keywords: COVID-19, knowledge, awareness, coronavirus, gloves, disposal**

**INTRODUCTION:**

Coronavirus disease 2019 (COVID-19) is a recent infectious disease caused by Coronavirus 2 Severe Acute Respiratory Syndrome (SARS-CoV-2). Coronaviruses are members of enveloped, single-stranded, positive-strand RNA virus families which have affected more than 188 Countries and Kingdoms **[1, 2]**.

As of April 2021, there have been 17,313,163 confirmed cases of COVID-19, including 195,123 deaths, reported to WHO **[6]**. Despite the number of deaths associated with Covid-19, SARS-CoV-2 appears to have a lower-case fatality rate than either SARS-CoV or Middle East respiratory syndrome–related coronavirus (MERS-CoV). Compromised respiratory status on admission (the primary driver of disease severity) was associated with worse outcomes **[3, 4]**.

The COVID-19 virus is spread primarily from person to person through the transmission of respiratory droplets, which occurs when someone is in close contact with someone who is actively coughing or sneezing. This happens by exposure to the incoming infectious respiratory droplets of the host's mucosal surfaces, i.e. eyes, nose, and mouth **[5, 6, 7]**. The incubation period of COVID-19, which is the time from the onset of symptoms to exposure to the virus, is 5-6 days but can be up to 14 days **[11]**.

From subclinical self-limiting respiratory tract disease to extreme progressive pneumonia with multi-organ failure and death, the wide spectrum of COVID-19 infections varies. More than 80 percent of cases remained asymptomatic, as illustrated by studies and observations, and 15 percent of cases were mild cases with normal

symptoms such as fever, cough, weakness, and loss of smell and taste **[12]**. Furthermore, people over the age of 65, those with severe obesity and chronic liver or kidney disease are more likely to experience COVID-19 severe illness **[13-15]**.

On that note, researchers are experimenting with several different methods and treatment methodologies to eradicate this novel coronavirus. Antibiotics are not successful against the virus **[16]**. Extreme prevention methods were adopted by countries all over the world in response to the announcement of a global pandemic on March 11, 2020 **[9]**. The WHO advised the public to only obtain information about COVID-19 from well-respected sources (e.g. national public **[17, 18]** health authorities and to take precautions such as social distancing, hand hygiene, and refraining from touching **[19, 20]**. critical in limiting People are believing various myths about the COVID-19 pandemic. With the rise of social media, unproven transmission prevention strategies are rapidly spreading. In India, we found that the general public uses disposable latex gloves in their everyday activities. Before the COVID-19 pandemic, we had never seen those groups of people wearing gloves **[21]**. We can't determine whether wearing disposable gloves when out in public raises or decreases the risk of virus transmission. It has yet to be explored. When people touch their faces after handling contaminated surfaces, the disease spreads quickly **[22]**. Coughing drops stay on surfaces for varying amounts of time. According to research, SARS-CoV-2 can persist for up to 24 hours on cardboard and up to 3 days on plastic and stainless steel surfaces **[23]**. The current study aims to measure the knowledge, attitude and awareness of wearing and handling gloves during this COVID pandemic and use of this research could be used to improve strategic management for public health.

**MATERIALS AND METHODS:**

A cross-sectional study was conducted between March 2020 to May 2020, in the Chennai population using a convenience, non-probability sampling technique. Using Google Forms, a semi-structured questionnaire was created in simple, understandable English. The survey was sent out via WhatsApp, e-mail, and other social media platforms. The participants were sufficiently responsible in obtaining their responses that they forwarded them to their contacts, resulting in a response. This study included participants who have smartphones with internet access, over the age of 15 who were fluent in English responded. A survey questionnaire had been used to collect data from the people. The questionnaire comprised 24 questions. A pilot survey of 10 individuals was

undertaken first to ensure that the questions elicited the appropriate response and there were no problems with the entry of answers into the database. Since it was not feasible to conduct a community-based national sampling survey during this critical period; we decided to collect the data online through a Google survey. We got 450 responses in total, but we had to discard some because they were incomplete. To arrive at our conclusions, we evaluated 394 replies.

**Statistical analysis:**

The data were analysed using SPSS software, and the findings are presented in a pictorial graph **Figure 1-4**.

**RESULTS:**

**Table 1: Represents the demographic data of the people included in the study sample**

| Demographic data | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| **Female** | **215** | **54.8%** |
| **Male** | **179** | **42.2%** |
| **Age** | | |
| **21-40** | **292** | **74.4%** |
| **41-60** | **67** | **17.7%** |
| **> 60** | **35** | **8.8%** |

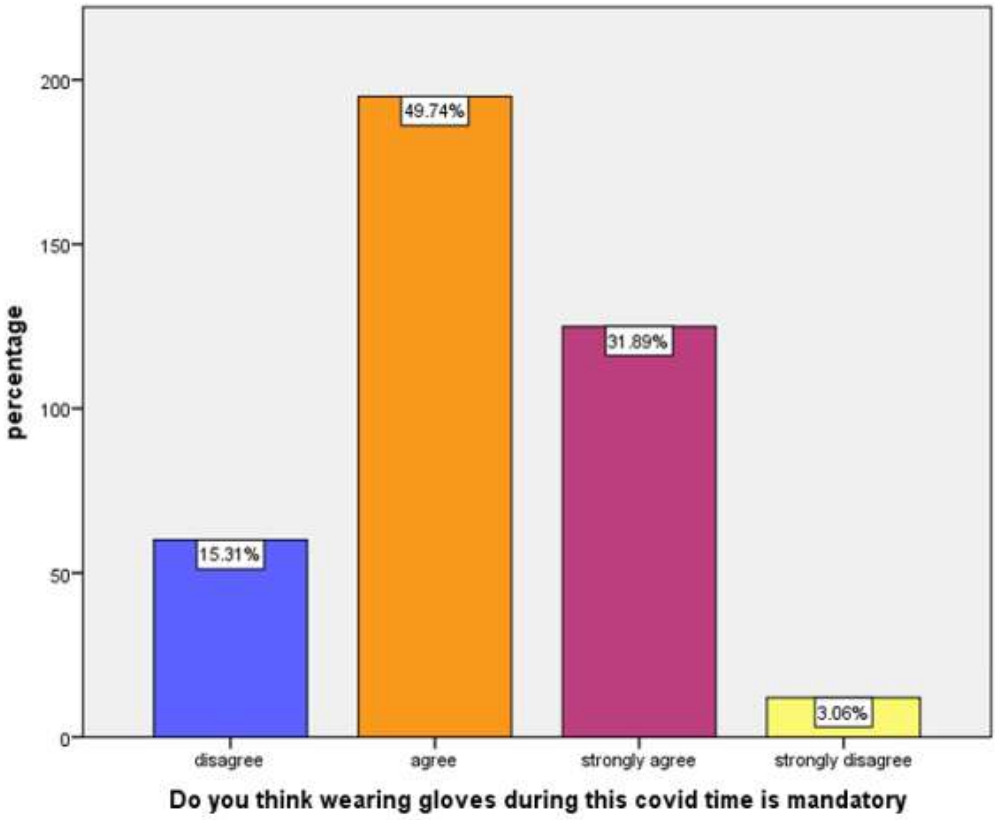


**Figure 1: represents the bar graph the percentage of people who think wearing gloves during this pandemic is mandatory. 73.63% of people have answered that wearing gloves during this pandemic is mandatory. 26.37% of people have answered that wearing gloves during this pandemic is not mandatory**

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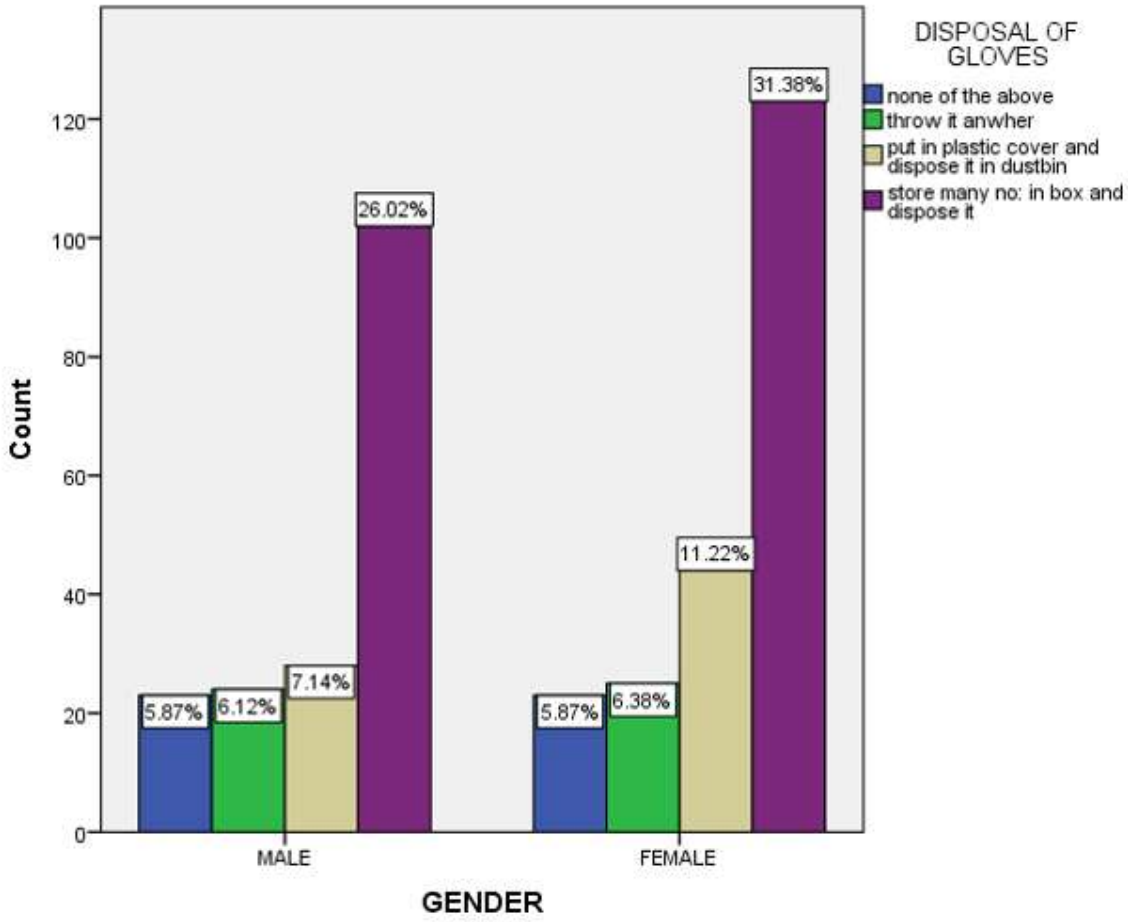


**Figure 2: Represents the relationship between gender and the disposal of gloves by people. The vast majority of people keep a package of gloves in which they hold a large amount of gloves and then dispose of it. The chi square test (p value = 0.022) revealed a statistically relevant relationship between gender and the disposal of gloves by individuals**

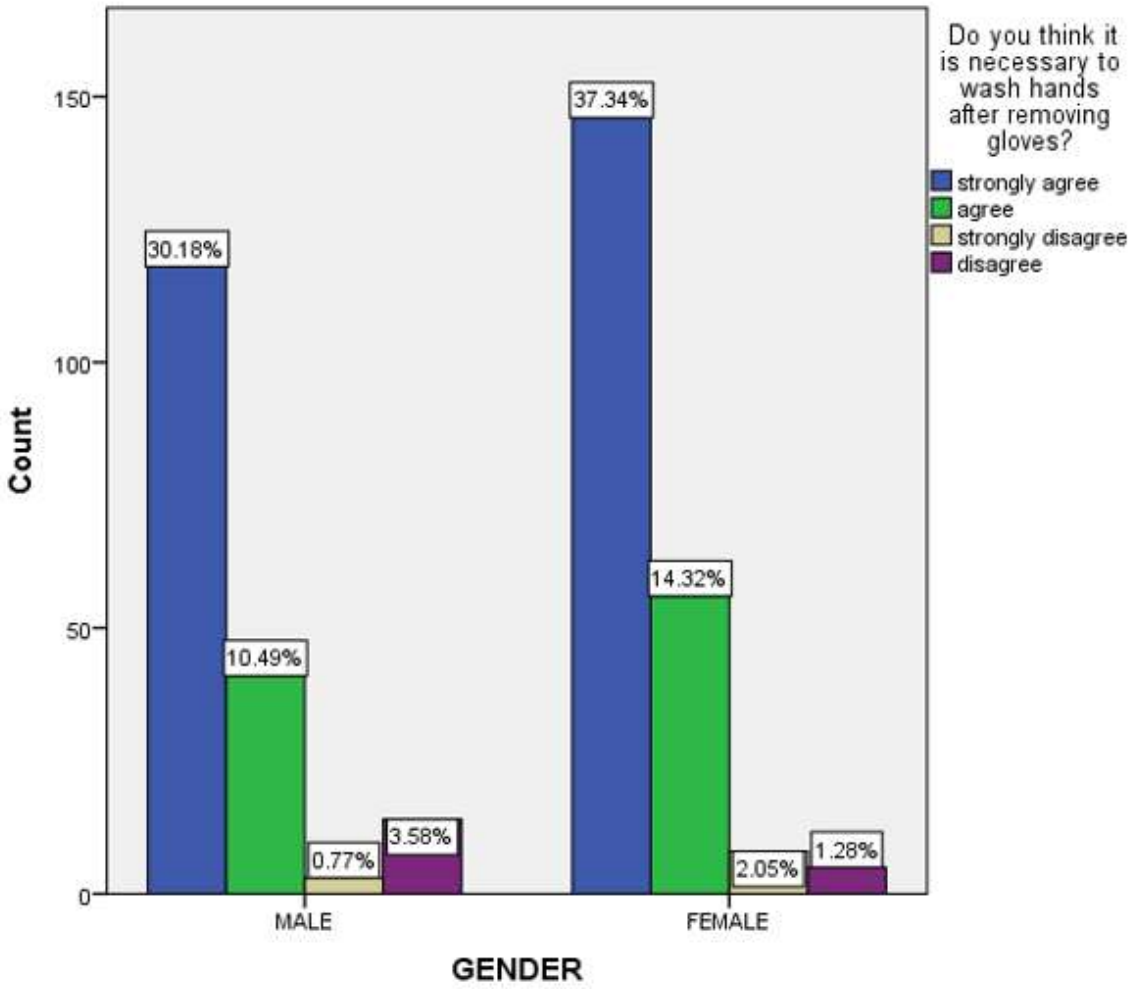


**Figure 3: Represents the relationship between gender and the number of individuals who believe it is important to wash hands after removing gloves. Females have a higher level of awareness than males. The association between gender and self-hygiene awareness was tested using the chi-square test (p value = 0.002) and found to be statistically significant**

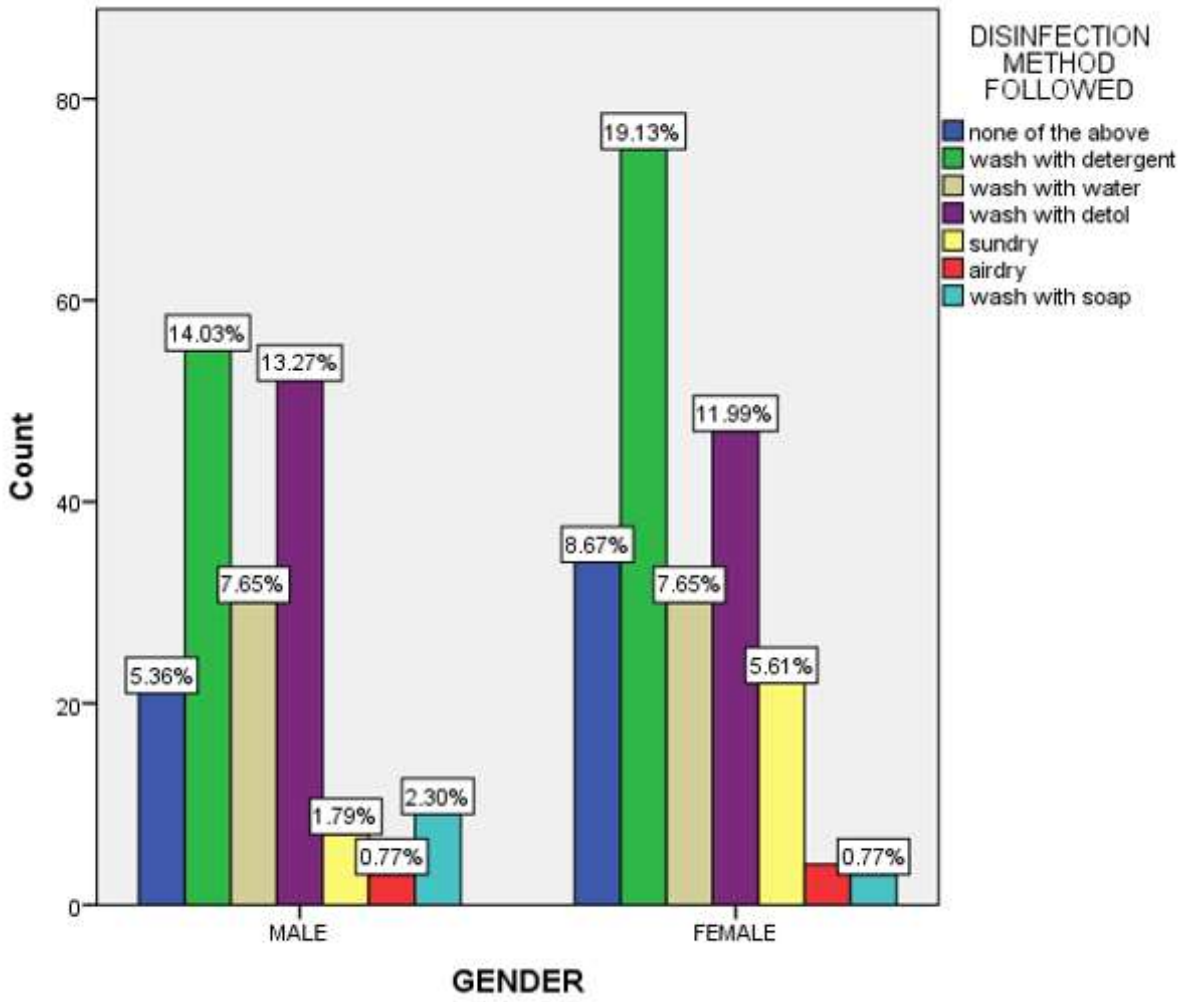


**Figure 4: Indicates the relationship between gender and the disinfection process followed by the people . The graph shows that the vast majority of females wash their reusable gloves using detergent. The chi-square test (p value = 0.014) was used to study the relationship between gender and disinfection method used, and it was found to be statistically significant**

The study population comprises 394 people residing in the locality of Chennai. Of 394 people, 54.8% are females and 42.2% are males. The survey was conducted to people of 3 different age groups 21-40 years with about 74.4% of responses and 41-60 years with 17.7% of responses and >60 years with 8.8% of responses. Our study showed, 84.23% of individuals, were aware of wearing gloves during this pandemic, and the remaining 12.87% were not aware of wearing gloves during this pandemic. 73.63% of individuals with 75.2% of females and 35.8% of males agreed that wearing gloves is mandatory during this pandemic, 26.47% denied that wearing gloves is not mandatory

About 8.9% of people refused to use gloves during pandemics. Among the 84.23% individuals who agreed upon wearing gloves , 32.7% being used with single-use gloves , 28.1% with reusable gloves, and

both (30.4%) being used by almost equivalent numbers of people. In terms of single-use gloves, the majority of people (45.4%) used latex, followed by polyethylene (5.7%), non-latex (9.7%), nitrile (5.6%), 21.7 % did not use any gloves, and the remaining 12% used another type.

The majority of the subjects (70.7%) never reused the single-use gloves, while the remaining 30.3 percent did so several times in less than a week. When it comes to reusable gloves, the majority of people (42.23 %) preferred cotton gloves, followed by 23.98 % who declined to use gloves during the outbreak, 20.66 % who have used latex gloves, 4.85 % who have used nylon, and 8.16 % who have used something else. The gloves were reused by 89.32 percent of people for more than a month.

The bar graph shows that the majority of people dispose of gloves by stacking them in a box and then throwing them away in a bin (57.40 %), with the others thrown away somewhere (12.50 percent), Put them in a plastic bag and throw it in the garbage (18.36 percent). Chi-square analysis showed a positive finding on t with p-value = 0.002(p-value 0.05) statically significant.

Awareness of disinfection methods among the study population, a vast number of the people washed their gloves using the only detergent with about 33.04% while remaining followed various other methods like washing with Dettol and water (25.26%, 15.63% respectively), sun drying, and air drying ( 7.4%, 5.4%) and washing with soap (3.07%). Chi-square analysis showed statistically significant results on the association between gender and the disinfection methods followed by the people.63.01% of individuals are aware that wearing gloves for the long term can cause skin rashes while the remaining 16.58% and 20.41% are not aware and not sure of long-term side effects respectively.

**DISCUSSION:**

Our study describes the types and acceptance of glove-wearing practice during the local COVID- 19 outbreak. The awareness about glove wearing during this pandemic was 73.63% among the people in the Chennai population. We were not able to compare with awareness of our study population with other studies which have reported glove use among the non-healthcare population, yet one study by gunasekaran et al 2020 concluded the prevalence of wearing gloves during the covid pandemic to be 2.5% (13 subjects) among the population of 75 individuals.

Although glove usage was low in the sample public, the general population's use of gloves has undeniably increased as a result of the COVID-19 outbreak. When a local outbreak occurs, there has been a significant rise in the use of personal

protective equipment (PPE) in both community and healthcare settings **[19, 20, 26]**. The media's coverage of disturbing images of civilians, officials, and healthcare workers wearing comprehensive personal protective equipment (PPE) increased public awareness of the need to wear PPE. Evidence of SARS-CoV-2 virus **[22, 24, 26]** found on surfaces in patient rooms **[23, 26]** may have prompted the use of gloves during the early stages of the outbreak. To date, there is no clinical evidence accepting or refuting the benefit of glove-wearing among the public concerning the Covid-19 pandemic **[22-24, 26]**.

The majority of participants in our survey were young. This trend can be explained by the demographic data **(Table 1)** as well as the tendency of a relatively young population to regularly use smartphones and social media. We found that the majority of the individuals thought that wearing gloves during this pandemic is mandatory to reduce the spread of covid [(26).] Among them, the majority of the individuals are female. This confirms that females had more awareness about wearing gloves during this pandemic than the male with statistically significant results on chi-square analysis. (P-value = 0.001). This may be due to varied gender responses.

When the people were asked about the type and frequency of usage of gloves, a nearly equal percentage of individuals used single-use gloves, reusable gloves, and both with a frequency of less than a week for single-use and more than a month for reusable gloves.

The majority of individuals have stated that they dispose of gloves by stacking them in a box and then throwing them away in a bin (57.40 %), with the remainder being thrown away somewhere (12.50 %), Put it in a plastic bag and toss it in the garbage (18.36 %). Chi-square analysis showed a significant result p-value = 0.002(p-value < 0.05) statistically significant on the correlation between gender and People's awareness on disposal methods of gloves.

When asked whether they preferred to wash their hands after removing gloves, the majority of people agreed (92.25 %), with 73.40 % belonging to the younger age group, 13.03 % to the middle age group, 6.4 % to the older age group, and 7.68 % disagreeing. This finding is in line with a previous study by Sana *et al*. (2018), which found that the **[29]** majority of people are only aware of the principle of hand washing for particular purposes. This is because diseases are more prevalent in the elderly and young individuals. Our results showed people were aware that the elderly and children are more prone to infections as compared to other groups. On the correlation between gender and knowledge regarding washing hands after removing

gloves, the p-value is found to be 0.002, which is statistically significant.

We have also observed that the majority of the individual were aware that long term usage of gloves causes skin rashes from figure 8 about 63.07% of individuals were aware of the rashes caused by wearing gloves and 16.58% of individuals were not aware and 20.41% of individuals were not sure about it. This high awareness about the rashes caused by long-term usage of gloves is due to the updated knowledge. Though gloves were not recommended, the public might still choose to wear gloves to boost morale or a sense of protection.

With growing social media, unproven techniques for prevention of transmission are spreading quickly. We observed people wearing gloves while driving, reporting news, selling vegetables, doing groceries, participating in social events, and a variety of other activities. Before the COVID-19 pandemic, we had never seen those groups of people wearing gloves. We can't tell whether wearing disposable gloves when out in public raises or decreases the risk of virus transmission. It can also be spread by touching infected surfaces and then touching one's face.

**[28]** Because the study's sample size is not generalised and only persons who own smartphones or other electronic devices are eligible to participate in the study. Based on the evidence above, hand hygiene, in combination with adequate personal protective equipment, is critical in breaking the cycle of touching infected environmental surfaces and subsequent virus inoculation by contact with mucous membranes, thereby reducing the risk of COVID-19 transmission **[27, 28]**.

**CONCLUSION:**

Within the limitation of study, the following conclusion can be drawn that majority of the people residing in Chennai have good knowledge and awareness of wearing and proper handling of gloves during this pandemic.

**Conflict of Interest:** no conflict of interest

**Ethical clearance** - Approval from Saveetha ethical committee

**Source of funding**- Self funding

**REFERENCES**

**[1]** Saxena SK. Coronavirus Disease 2019 (COVID-19): Epidemiology, Pathogenesis, Diagnosis, and Therapeutics [Internet]. Springer Nature; 2020. 213 p. Available from: https://play.google.com/store/books/details?id=qovgDwAAQBAJ

**[2]** Baden LR, Rubin EJ. Covid-19 - The Search for Effective Therapy. N Engl J Med [Internet]. 2020 May 7;382(19):1851–2. Available from: http://dx.doi.org/10.1056/NEJMe2005477

**[3]** Sims AC, Baric RS, Yount B, Burkett SE, Collins PL, Pickles RJ. Severe acute respiratory syndrome coronavirus infection of human ciliated airway epithelia: role of ciliated cells in viral spread in the conducting airways of the lungs. J Virol [Internet]. 2005 Dec;79(24):15511–24. Available from: http://dx.doi.org/10.1128/JVI.79.24.15511-15524.2005

**[4]** Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. [updated on 2020 march 29 ; cited 2021 Sep 17]. Available from: https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations

**[5]** Chowell G, Mizumoto K. The COVID-19 pandemic in the USA: what might we expect? [Internet]. Vol. 395, The Lancet. 2020. p. 1093–4. Available from: http://dx.doi.org/10.1016/s0140-6736(20)30743-1

**[6]** Falcone M, Tiseo G, Barbieri G, Galfo V, Russo A, Virdis A, et al. Role of Low-Molecular-Weight Heparin in Hospitalized Patients With Severe Acute Respiratory Syndrome Coronavirus 2 Pneumonia: A Prospective Observational Study [Internet]. Vol. 7, Open Forum Infectious Diseases. 2020. Available from: http://dx.doi.org/10.1093/ofid/ofaa563

**[7]** Fang L, Karakiulakis G, Roth M. Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection? [Internet]. Vol. 8, The Lancet Respiratory Medicine. 2020.[ updated 2020 april 8: ;cited november 21] . Available from: http://dx.doi.org/10.1016/s2213-2600(20)30116-8

**[8]** Chowell G, Mizumoto K. The COVID-19 pandemic in the USA: what might we expect? [Internet]. Vol. 395, The Lancet. 2020. p. 1093–4 [ updated 2020 Apr 4; cited 2021 nov 21]. Available from: http://dx.doi.org/10.1016/s0140-6736(20)30743-19.

**[9]** Centers for Disease Control and Prevention. People Who Are at Higher Risk for Severe Illness. (2020) [Internet]. (accessed March 29, 2020) [cited 2021 Apr 15] Available online at: https://www.cdc.gov/ coronavirus/2019- ncov/need- extra-

precautions/people- at- higher-risk.html

**[10]** Website [Internet]. Available from: Bedford J, Enria D, Giesecke J, Heymann DL, Ihekweazu C, Kobinger G, et al. COVID-19: towards controlling a pandemic [Internet]. Vol. 395, The Lancet. 2020. p. 1015–8. Available from: http://dx.doi.org/10.1016/s0140-6736(20)30673-5

**[11]** Chakrabarti SS, Kaur U, Banerjee A, Ganguly U, Banerjee T, Saha S, et al. COVID-19 in India: Are Biological and Environmental Factors Helping to Stem the Incidence and Severity? Aging Dis [Internet]. 2020 May;11(3):480–8. Available from: http://dx.doi.org/10.14336/AD.2020.0402

**[12]** Mohseni H, Amini S, Abiri B, Kalantar M. Comparison of Food Intakes of Diabetes, Hypertension and Heart Disease Patients with Clinical Symptoms of COVID-19 and Asymptomatic Controls [Internet]. Available from: http://dx.doi.org/10.21203/rs.3.rs-84142/v2

**[13]** Centers for Disease Control and Prevention. Keeping Hands Clean [Internet] ,Available from: https://www.cdc.gov/healthywater/hygiene/hand/handwashing.html; 2020 [Accessed 15 May 2020] [cited 2021 Apr 15]

**[14]** Kumar S, Rahman R. Knowledge, Awareness, And Practices Regarding Biomedical Waste Management Among Undergraduate Dental Students [Internet]. Vol. 10, Asian Journal of Pharmaceutical and Clinical Research. 2017. p. 341. Available from: http://dx.doi.org/10.22159/ajpcr.2017.v10i8.19101

**[15]** Sharma S, Sharma (dr) Suresh K., Principal PC, AIIMS, College of Nursing, Uttarakhand R, et al. Knowledge, Attitude and Practices towards Road Traffic Safety Regulations among Health Science Students in Uttarakhand: A cross-sectional study [Internet]. Vol. 5, International Journal of Advanced Research. 2017. p. 608–14. Available from: http://dx.doi.org/10.21474/ijar01/3550

**[16]** Maier HJ, Bickerton E. Coronaviruses: Methods and Protocols [Internet]. Humana; 2021. 278 p. Available from: https://books.google.com/books/ab

out/Coronaviruses.html?hl=&id=YpKQzgEACAAJ

**[17]** van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med [Internet]. 2020 Apr 16;382(16):1564–7. Available from: http://dx.doi.org/10.1056/NEJMc2004973

**[18]** Ravikumar D, Jeevanandan G, Subramanian EMG. Evaluation of knowledge among general dentists in treatment of traumatic injuries in primary teeth: A cross-sectional questionnaire study. Eur J Dent [Internet]. 2017 Apr;11(2):232–7. Available from: http://dx.doi.org/10.4103/ejd.ejd_357_16

**[19]** Subashri A, Uma Maheshwari TN. Knowledge and attitude of oral hygiene practice among dental students [Internet]. Vol. 9, Research Journal of Pharmacy and Technology. 2016. p. 1840. Available from: http://dx.doi.org/10.5958/0974-360x.2016.00375.9

**[20]** Sauer PC. Multi-tier sustainable supply chain management - learning from the minerals case [Internet]. kassel university press GmbH; 2019. 196 p. Available from: https://books.google.com/books/about/Multi_tier_sustainable_supply_chain_mana.html?hl=&id=tFKGDwAAQBAJ

**[21]** Rowan NJ, Laffey JG. Challenges and solutions for addressing critical shortage of supply chain for personal and protective equipment (PPE) arising from Coronavirus disease (COVID19) pandemic - Case study from the Republic of Ireland. Sci Total Environ [Internet]. 2020 Jul 10;725:138532. Available from: http://dx.doi.org/10.1016/j.scitotenv.2020.138532

**[22]** Cheng VCC, Wong S-C, Chen JHK, Yip CCY, Chuang VWM, Tsang OTY, et al. Escalating infection control response to the rapidly evolving epidemiology of the coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong [Internet]. Vol. 41, Infection Control & Hospital Epidemiology. 2020. p. 493–8. Available from: http://dx.doi.org/10.1017/ice.2020.58

**[23]** Holland M, Zaloga DJ, Friderici CS. COVID-19 Personal Protective Equipment (PPE) for the emergency physician [Internet]. Vol. 19, Visual Journal of Emergency Medicine. 2020. p. 100740. Available from: http://dx.doi.org/10.1016/j.visj.2020.100740

**[24]** Gallagher, S., Coronavirus: Can Latex Gloves Protect You From Catching Deadly Virus?, in the independent. 2020: [Internet]. [ updated 06 October 2020; cited 2021 Apr 19]. Available from: https://www.independent.co.uk/life-style/health-and-families/coronavirus-do-gloves-work-stop-virus-spread-symptoms-outbreak-a9362871.html.

**[25]** BERNAMA, COVID-19: Better off without gloves - Specialists, in BERNAMA. 2020: [Internet]. [ updated 2020 Mar 20 ;cited 2021 Apr 19] Available from : https://www.bernama.com/en/general/news_covid-19.php?id=1825932.

**[26]** Bhattacharya S, Hossain MM, Singh A. Addressing the shortage of personal protective equipment during the COVID-19 pandemic in India-A public health perspective. AIMS Public Health [Internet]. 2020 Apr 15;7(2):223–7. Available from: http://dx.doi.org/10.3934/publichealth.2020019

**[27]** Dos and don'ts of wearing gloves to avoid COVID-19 transmission This article was published in thejakartapost.com with the title "Dos and don'ts of wearing gloves to avoid COVID-19 transmission". Click to read: https://www.thejakartapost.com/life/2020/04/11/dos-and-donts-of-wearing-gloves-to-avoid-covid-19-transmission.html. Download The Jakarta Post app for easier and faster news access: Android: http://bit.ly/tjp-android iOS: http://bit.ly/tjp-ios

**[28]** MacIntyre CR, Cauchemez S, Dwyer DE, Seale H, Cheung P, Browne G, et al. Face mask use and control of respiratory virus transmission in households. Emerg Infect Dis [Internet]. 2009 Feb;15(2):233–41. Available from: http://dx.doi.org/10.3201/eid1502.081167

**[29]** Adhikari SP, Meng S, Wu Y-J, Mao Y-P, Ye R-X, Wang Q-Z, et al. Epidemiology, causes, clinical manifestation and diagnosis,

prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. Infect Dis Poverty [Internet]. 2020 Mar 17;9(1):29. Available from: http://dx.doi.org/10.1186/s40249-020-00646-x