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ORIGINAL ARTICLE

The Effect of Covid-19 Pandemic in Hand Hygiene Behaviour Among Elderly Persons in Chennai District

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Abstract

Background: The COVID-19 pandemic has emphasized the importance of effective hand hygiene in reducing transmission of infectious diseases. Older adults face increased vulnerability due to age-related risks, co-morbidities, and limited access to digital health information. Understanding their knowledge, attitudes, and practices (KAP) toward hand hygiene is essential for targeted interventions. **Materials and Methods:** A cross-sectional study was conducted among 202 elderly individuals (≥60 years) attending a government tertiary care hospital in Chennai. A validated, structured KAP questionnaire consisting of 27 items was administered after obtaining informed consent and ethical clearance. Data were analysed using SPSS version 26, applying descriptive statistics, Pearson's correlation, and significance testing at $p < 0.05$. **Results:** The mean participant age was 68.87 years; 52% were males. Most participants demonstrated adequate knowledge of COVID-19 transmission, with 82.7% reporting exposure to government awareness initiatives. Knowledge scores negatively correlated with age ($r = –0.167$, $p = 0.018$). Positive attitudes were reported by the majority, and significant behavioural improvements were observed after the pandemic, including increased handwashing frequency (48.2%), greater use of liquid soap, and higher adoption of hand sanitiser use. However, gaps persisted in correct technique, recommended duration, and key hand-hygiene moments. **Conclusion:** The pandemic substantially improved hand-hygiene knowledge and practices among elderly persons; however, deficiencies in technique, accessibility, and perceived vulnerability highlight the need for focused health education, improved resource availability, and sustained public-health reinforcement to protect high-risk elderly populations.

Keywords: COVID-19, Hand hygiene, Elderly population, Behavioural changes

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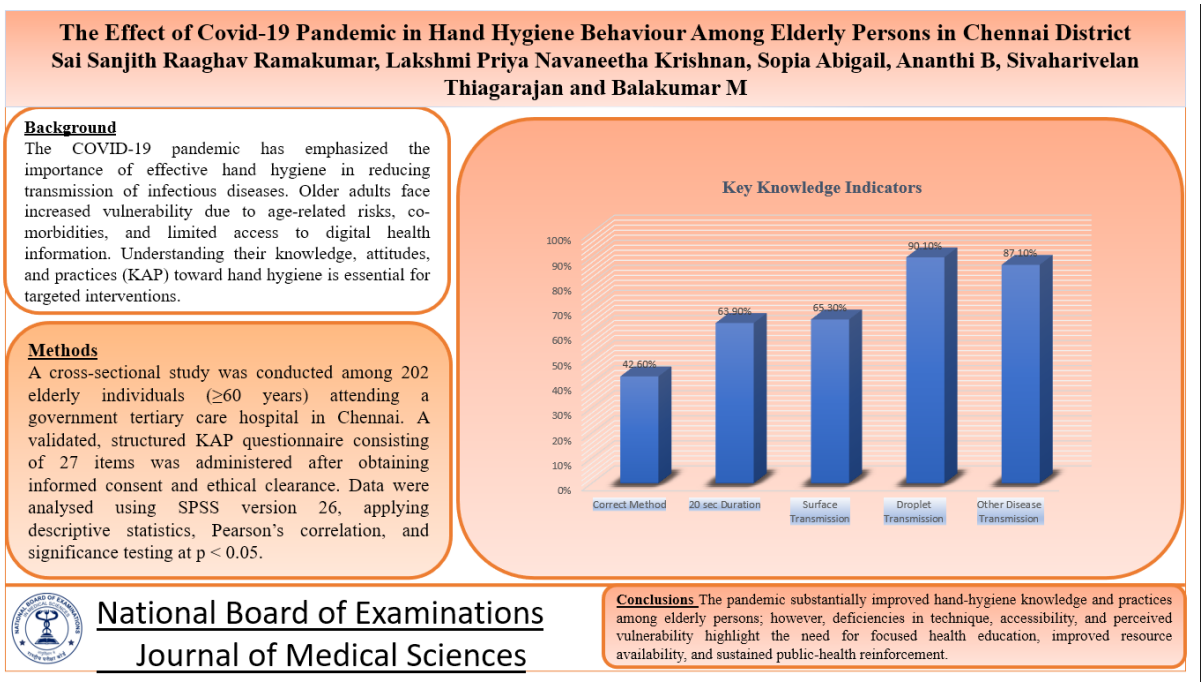
Graphical Abstract



Introduction

The SARS-CoV-2 (COVID-19) pandemic has had a profound impact on the health, well-being and economy of people all over the world. Globally, as of 26th October,2022, 625,740,449 confirmed cases of COVID-19, including 6,563,667 deaths, were documented by WHO [1]. India is the world's second-most populous and the second-worst affected country by COVID-19 to date (in terms of the total number of confirmed COVID-19 cases). In India as of 26th October,2022 44,645,768 confirmed cases of COVID-19 including 528,981 deaths has been documented by WHO [2]. While significant amount of investment has been made in the development and roll out of vaccines for COVID-19, behavioural prevention continues to be critical in reducing COVID-related morbidity and mortality. Hand-washing is an important and the most cost-effective strategy for minimising transmission of COVID-19 and other respiratory viruses, diarrhoeal diseases and outbreaks of viral hemorrhagic fevers like Ebola [3].

The current COVID-19 pandemic has brought an increased focus on the importance of hand-washing aimed both at people working within the health sector as well as to the general public. There has been promotion of awareness raising initiatives through various means about the importance and correct techniques of hand-washing. Memes, messages and short videos directed at reaching people on their handheld devices including through social media, and mainstream television, print advertisements, radio and billboards are all in use, and all with the same message that effective hand- washing is crucial to stop the spread of COVID-19 [4].

When policies and public health interventions aim to secure health for all, due prudence need to be given to vulnerable populations. The issue of health inequalities unfolding during disease outbreaks has been extensively investigated across pandemics [5,6].

Elderly people are at a higher risk of COVID-19 infection and the course of the disease tends to be more severe in them resulting in higher mortality [7][8]. Hence awareness and practices on hand-washing strategy is very important among the elderly. However, there is insufficient data to know if the importance of hand-washing has sufficiently reached the elderly people, who have lower exposure to digital and mass media and may find the concept of using hand sanitisers unusual [9].

The study design we have opted for in this research is questionnaire-based Cross- sectional study using the KAP survey model. This design is observational in nature and is also known as descriptive research. This study design can provide a useful jumpstart to further researches.

While the importance of hand-washing has been identified in multiple publications [10], there is limited empirical evidence on hand-washing knowledge, attitude and practices especially in India in the context of the COVID-19 pandemic. It is important to address the deficiencies in KAP literature on Hand-washing at the community level. To fill this gap and aid in the ongoing and future pandemic prevention efforts, this study examines the determinants and trends of hand-washing knowledge, attitude and practices among elderly persons, who are a particularly vulnerable population, in Chennai, a major cosmopolitan city in India.

The findings can be used to design a health educational program to promote effective hand-washing practices among elderly persons.

Materials and methods

Study design: Cross-sectional study

Study setting: Government tertiary care hospital in Chennai.

Study population: Elderly persons of 60 years or more

Study period: August 20,2022 to October 20,2022

Sample size: 202 study participants

Inclusion Criteria & Exclusion Criteria

Elderly persons aged 60 years and above who were willing to participate were included in the study, while individuals below 60 years of age or unwilling to participate were excluded.

Questionnaire Preparation and Statistical Analysis

A self-administered, expert-validated KAP questionnaire comprising 5 sociodemographic items and 27 questions on knowledge, attitude, and handwashing practices was used. The questionnaire was expert-validated, involving subject experts from microbiology and community medicine who assessed content relevance, clarity, and comprehensiveness. Necessary modifications were made based on expert feedback before data collection Data from 202 participants were analyzed using SPSS version 26, with normality testing performed and $p < 0.05$ considered statistically significant.

Results

Table 1. Distribution of Sociodemographic Characteristics among Study Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD	68.87 ± 6.59	—
	Median	67	—
	Range	60 – 87	—
Sex	Male	105	52.0%
	Female	97	48.0%
Educational Qualification	10th grade or lower	115	56.9%
	12th grade	49	24.3%
	Undergraduate	22	10.9%
	Postgraduate	16	7.9%
Co-morbid Conditions	Diabetes/Hypertension	83	41.4%
	Multiple co-morbidities	65	32.2%
	Other co-morbidities	11	5.4%
	No co-morbidities	43	21.3%

Table 1 shows that the mean age of participants was 68.87 ± 6.59 years with nearly equal gender distribution (52% males, 48% females). Most participants (56.9%) had education up to 10th grade or below. A large proportion had co-morbidities, with 41.4% having diabetes/hypertension and 32.2% having multiple co-morbid conditions.

Knowledge

Most participants demonstrated good awareness of COVID-19 transmission and hand hygiene, with high recognition of droplet (90.1%) and surface transmission (65.3%). While 63.9% knew the recommended 20-second handwashing duration, only 42.6% correctly identified liquid soap as ideal. Knowledge scores were higher among females and those with higher education and showed a significant negative correlation with age.

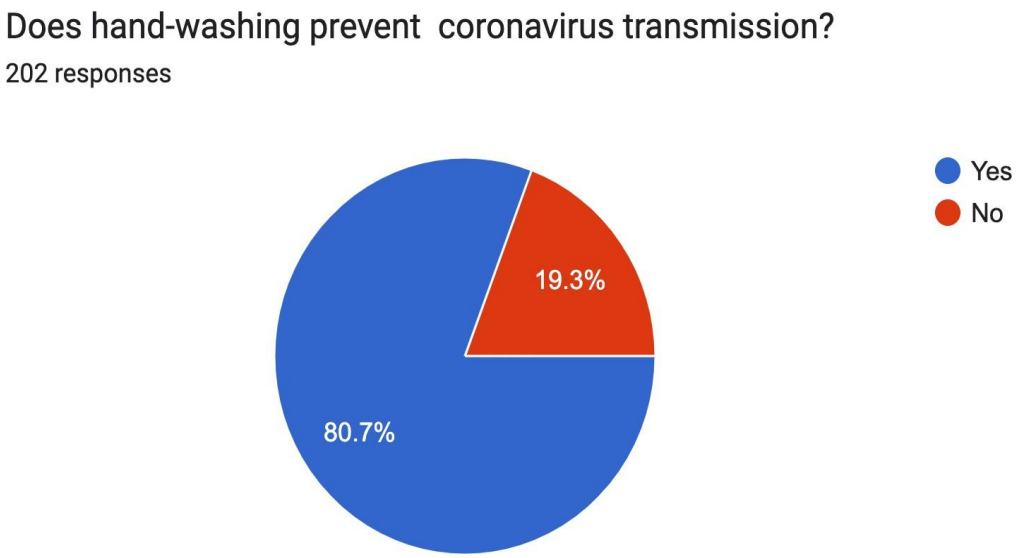


Figure 1. Participants on whether hand-washing prevents coronavirus transmission

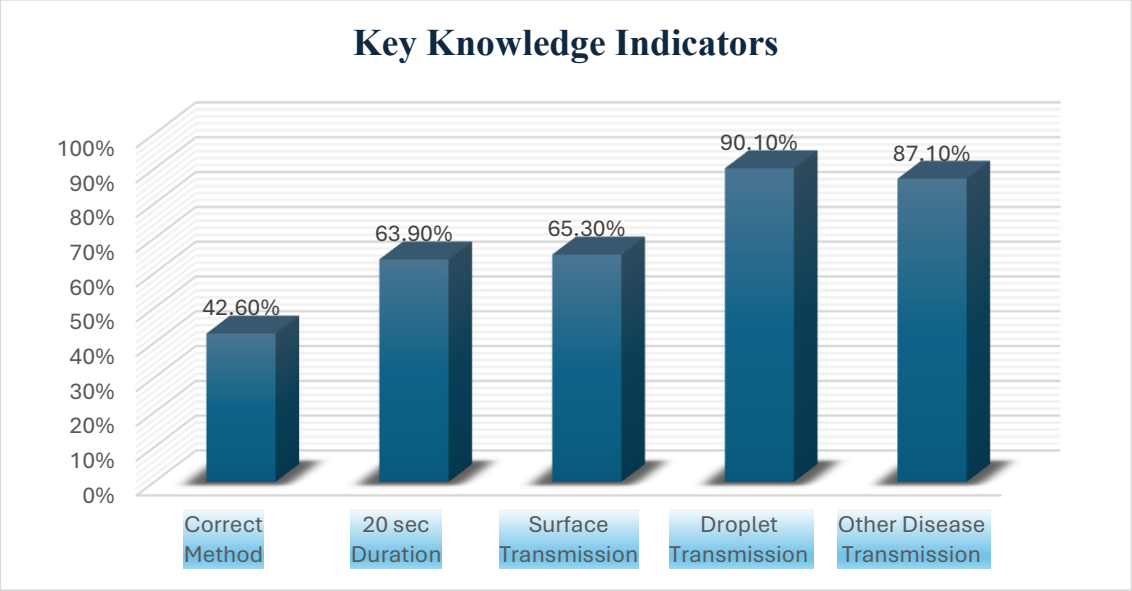


Figure 2. Knowledge Indicators Related to Hand Hygiene Practices

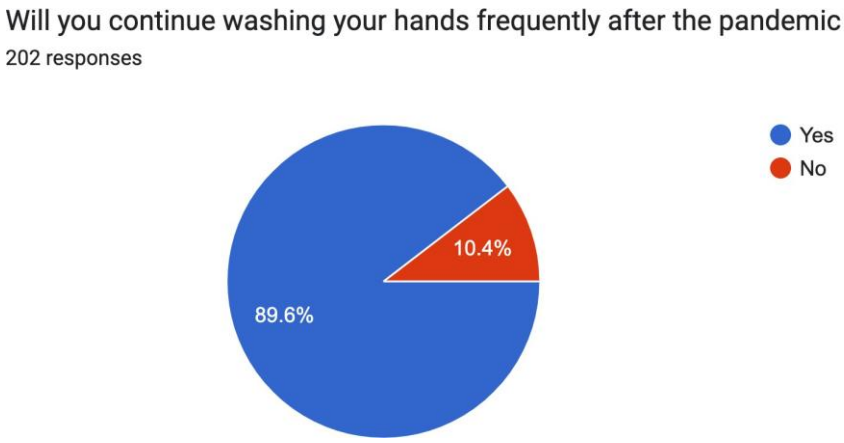


Figure 3. Answers of the participants on whether they will continue to wash their hands frequently after the pandemic is over

A positive attitude toward hand hygiene was observed: 73.8% felt vulnerable to COVID-19, 96% believed hand hygiene should be routine, and 89.6% intended to continue frequent hand-washing post-pandemic. No significant correlation existed between age and attitude scores.

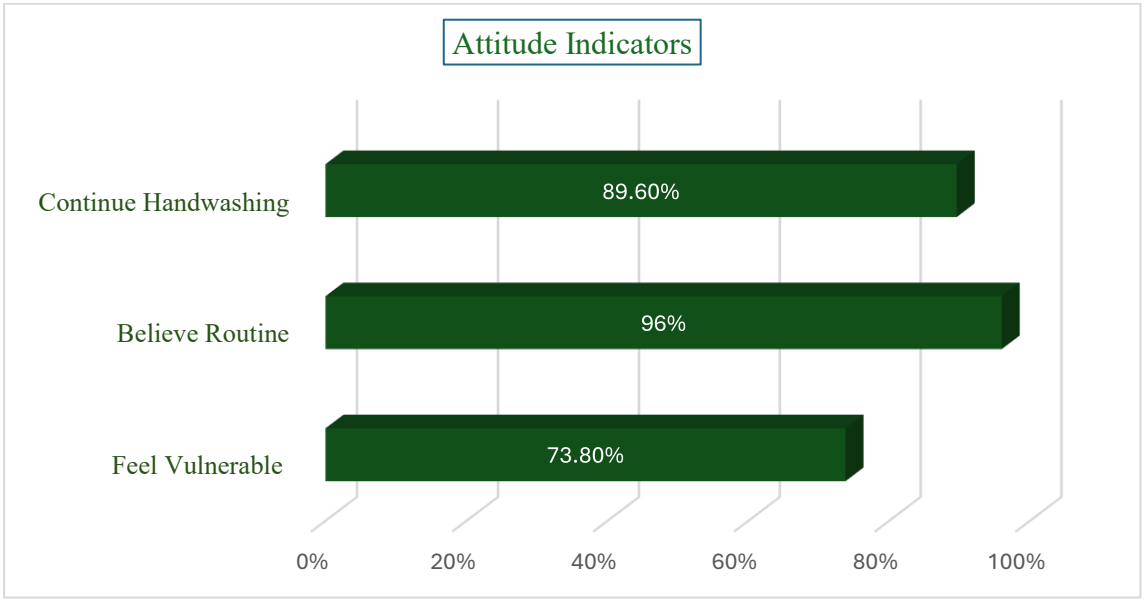


Figure 4. Attitude Levels Toward Hand Hygiene Among Elderly Participant

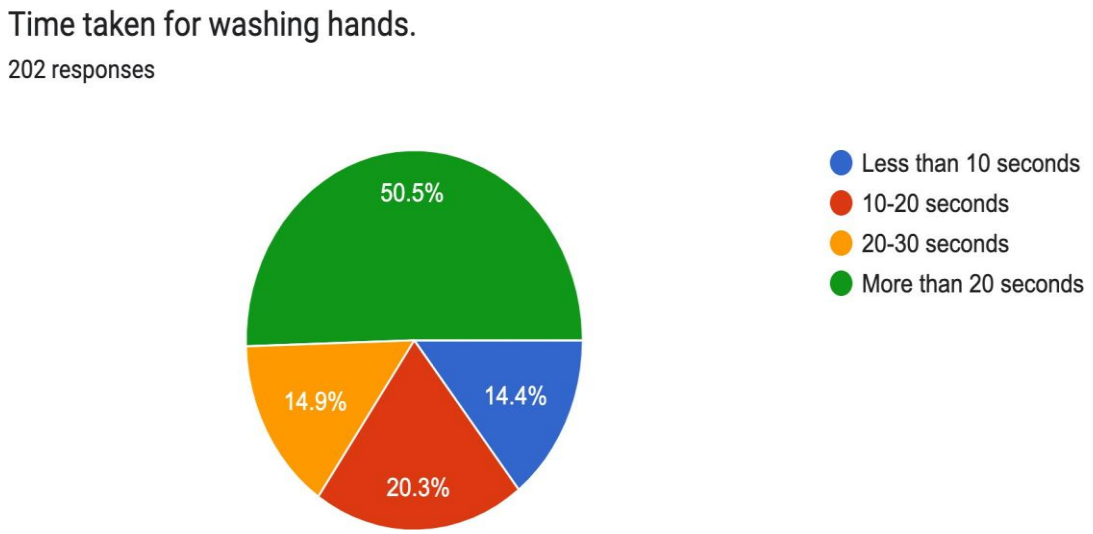


Figure 5. Time taken for washing hands but the participants

A marked improvement in hand hygiene behavior was observed after the COVID-19 pandemic, with liquid soap use increasing to 38.6% and non-use declining to 14.9%, while hand-sanitizer use rose from 2% to 12.9%, with 42% initiating use post-pandemic. Nearly 48.2% reported increased handwashing frequency and 50.5% washed hands for more than 20 seconds; mass media was the main awareness source (56.9%), though only 28.9% practiced handwashing before and after mask use.

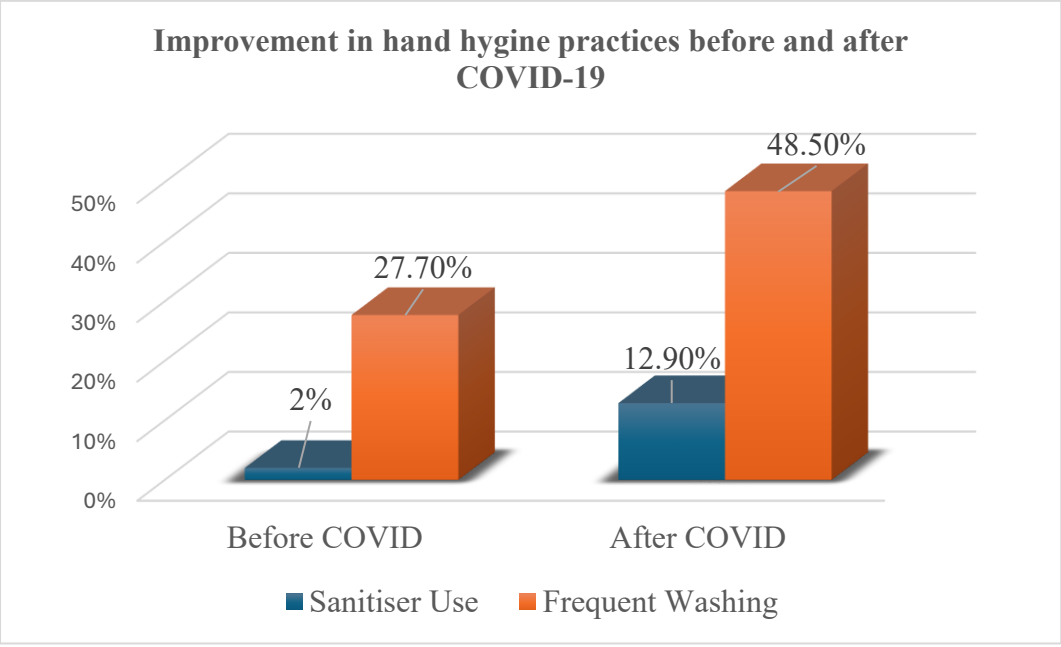


Figure 6. Correlation Between Age and Knowledge Score Among Elderly Participants (N = 202)

Table 2. Correlation Between Age and Knowledge Score on Hand Hygiene Among Elderly Participants (N = 202)

Variables	**Age**	**Knowledge Score**
Age	1.00	**–0.167***
Knowledge Score	**–0.167***	1.00
Significance (2-tailed)	—	0.018
N	202	202

***Correlation is significant at the 0.05 level.

The observed negative correlation between age and knowledge score (r = –0.167, p = 0.018) may be attributed to multiple factors. Increasing age is often associated with a decline in cognitive processing and memory retention, which can affect the ability to comprehend and recall newly disseminated health information. Additionally, older elderly individuals may have limited exposure to digital media and modern communication platforms, which were the primary channels for COVID-19 awareness campaigns. This digital divide likely contributed to relatively lower knowledge levels among higher age groups.

Discussion

This study was done to find out the determinants and trends in Knowledge, attitude and practices on Hand hygiene behaviour in the context of the COVID-19 pandemic among persons older than 60 years, who are at a greater risk of both severe COVID-19 and other infectious diseases due to their lower immunity and other co- morbid factors.

There is a significant negative correlation between age and the mean knowledge score of the respondent. As age increases from 60, the mean knowledge score decreased. This could be attributed to decline in an old adult's cognitive ability which hampers one's ability to comprehend and/or to recall new health information as well as a lower exposure to digital and mass media. However, there was no co-relation between age and the mean attitude score of the respondents. This finding is consistent with other similar studies.[11][12] while contradicting the study done by Kartheek et al. in Andhra Pradesh in 2022 [13], which suggested that age of the participant had no co-relation with their knowledge on hand-hygiene practices.

It is also observed that the respondents of the female sex scored a higher mean knowledge score and higher mean attitude score than their male counterparts. This finding is consistent with the Al-Wutayd et al. 2021's study [11]. Aunger et al. in their study [14] reported that factors such as business, tiredness or hunger can discourage male respondents from performing HH behaviour. Another possible explanation is that, females' high compliance can be also associated with their tendency to practice socially acceptable behaviour [15].

While there was no significant co-relation between presence of co-morbidities and the mean attitude score, it is observed that persons with no-co morbid factors had the highest mean knowledge score and

persons with multiple co-morbidities the least mean knowledge score. This could be because individuals who actively consume health related information and follow healthy habits continue their discipline in keeping themselves healthy. This finding is in concordance with the study done by Nshimyiryo et al. [16].

Although 82.7% of the participants in the study had been exposed to the awareness raising initiatives on hand-hygiene practices by the government, it is still concerning that 17.3% of the study population has not even been exposed to the importance of hand-hygiene during this critical pandemic. This suggests that more targeted and specific initiatives and policies should be implemented for the elderly population.12.8% of the study participants previously did not wash hands regularly but since the COVID-19 outbreak started have started washing regularly. 42% of the study participants who had not used hand-sanitisers before the COVID-19 have since the outbreak started using them.

Likewise, 48.2% of the study participants have increased their frequency of hand- washing and 48.1% have maintained their frequency of hand-washing after the pandemic. These findings are consistent with other similar studies [11] and reflect the significant amount of progress done in inculcating good hand hygiene behaviour due to the increased public awareness campaigns, initiatives and policies implemented during the pandemic.

Mass media like TV, radio and Newspapers have made the biggest impact in ensuring that awareness on hand-hygiene behaviour has reached the elderly population substantiated by 57% of the study population answering mass media as the cause of their awareness, 23,3% of the study population have stated that their reason for skipping hand-washing is due to the inability to afford hand-washing products and a further 7.9% of the study population citing inability to go to the shop and get it.

This implies that accessibility to hand-washing products still remains a major hurdle in our country, and policymakers must take not of it and ensure that good hand- hygiene practices is accessible to all.

The knowledge and practice of correct hand hygiene technique (duration of handwash, ideal hand wash product and indications for hand wash) is still lacking with only 50-60% of the study participants answering correctly. Inadequate handwashing can have the same effects of not handwashing [17]. Therefore, this is another critical aspect of hand-hygiene that needs to be prioritised in the public health initiatives and awareness.

25.9% of the study population believe they are not vulnerable to COVID-19. While this is concerning, it is lower than the 58% seen among the general population in the study conducted by Al-Wutayd et al. in 2021[11]. This finding might be due to the participants wanting to think positively or due to their perception of total immunity after completing their COVID-19 vaccination dose.

Conclusion

The COVID-19 pandemic is a still ongoing pandemic that has affected the entire world for more than 2 years and good hand-hygiene behaviour still remains the most cost-effective method to fight against it. The COVID-19 pandemic has brought an increased focus on the importance of hand-washing among both health care workers and the general public. The handwashing frequencies, soap and hand- sanitisers

usage and also knowledge on handwashing has increased among the elderly persons in Chennai. This is in concordance with multiple similar researches conducted across the world. Our study has also found that younger participants have a higher awareness correlating with better handwashing practices and therefore to create better awareness among the elderly population, especially the older elderly population, specific and targeted initiatives and policies incorporating their daily activities must be created for them.

This study contributes to public health by:

- Providing evidence on behavioural changes in a high-risk population
- Identifying gaps in knowledge and practice despite high awareness
- Highlighting age-related disparities in health literacy
- Supporting policy formulation for vulnerable groups
- Reinforcing the importance of hand hygiene as a cost-effective preventive strategy.

The study highlights several important policy implications:

- Need for targeted health education programs specifically designed for elderly populations
- Strengthening non-digital communication strategies (TV, radio, community outreach)
- Improving accessibility and affordability of hand hygiene products
- Incorporation of behavioural change communication (BCC) tailored to elderly needs
- Development of community-based interventions focusing on correct hand hygiene techniques

Recommendation

- Longitudinal studies to assess sustained behavioural changes post-pandemic
- Interventional studies evaluating effectiveness of targeted education programs
- Research exploring barriers to proper hand hygiene practices among elderly
- Studies assessing rural vs urban differences in hygiene behaviours
- Qualitative research on behavioural and psychosocial determinants

Acknowledgment

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Generalizability

The findings should be interpreted with caution. As the study was conducted in a single tertiary care hospital in Chennai, generalizability may be limited. However, the results provide valuable insights applicable to similar urban elderly populations in India, particularly in healthcare-access settings. Further multicentric studies are recommended for broader generalization.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

Funding

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