

Impact of COVID-19 on Consumer Hygiene Habits and Product Usage

1. Introduction

The onset of the COVID-19 pandemic triggered a global upheaval, influencing vast aspects of human interaction, economic activity, and public health practices. Among the most immediate and visible changes was the transformation in consumer behaviors, particularly with respect to hygiene products. The widespread fear of contagion and the urgent messages from health authorities emphasized the importance of hygiene as a primary means to prevent the virus's spread. This surge in consciousness has led to an unprecedented demand for hygiene-related products such as hand sanitizers, disinfectants and masks. These items, once considered peripheral in daily consumer spending, have become staples in households worldwide, reflecting a radical shift in societal norms and priorities.

Background:

In the wake of the pandemic, public and personal health strategies quickly pivoted towards preventive measures, promoting behaviors that could mitigate the spread of the virus. Central to these measures was the use of hygiene products, which saw a dramatic increase in consumption as communities worldwide responded to health advisories. This study explores the depth and permanence of these behavioral shifts. It seeks to understand whether these changes are temporary adaptations to a global crisis or represent a fundamental shift in the consumer psyche towards hygiene practices.

Research Objectives:

This research aims to:

Analyze the extent to which the COVID-19 pandemic has altered consumer purchasing patterns of hygiene products.

Determine if these changes are seen as temporary or if they have embedded new consumer values and behaviors regarding personal and public hygiene.

Explore demographic variations in the changes to understand which consumer segments have most significantly adjusted their behaviors.

Significance:

The significance of this research lies in its potential to guide public health policy and economic strategies in the post-pandemic era. By understanding whether changes in hygiene product consumption are enduring, policymakers and businesses can better prepare for future public health crises and adapt to a new consumer landscape.

2. Literature Review

1. **Chan, Amy (2020). "The Impact of COVID-19 on Consumer Behavior: Will It Change Forever?"**- Discusses COVID-19's impact on consumer behavior, highlighting shifts towards hygiene products driven by fear and uncertainty. Suggested changes may persist post-pandemic.
2. **Zhong, Shuai, and James W. Gentry (2021). "The Impact of COVID-19 on Consumer Packaged Goods Purchases."**- Analyzes changes in U.S. consumer packaged goods purchases, noting prioritization of essentials like hygiene products. Discusses factors influencing decision-making.
3. **Nguyen, Nga, et al. (2020). "Consumer Behavior in the Time of COVID-19: Case Study of Vietnam."**- Focuses on Vietnam, documenting increased demand for hygienic products and exploring socio-economic, policy, and media influences on consumer decisions.
4. **Ali, Fareena, et al. (2020). "Impact of COVID-19 on Consumer Buying Behavior."**- Primarily focused on food but touches on hygienic products. Discusses shift to online shopping and importance of product safety and trust.
5. **Liu, Jonathan, et al. (2021). "Consumer Behavior During the COVID-19 Pandemic."**- Highlights increase in online purchases and adoption of new hygiene practices. Directly relates to the study's focus on hygiene habits.

These reviews provide a comprehensive understanding of COVID-19's influence on consumer purchasing behaviors, particularly concerning hygiene products. They offer a strong theoretical foundation, indicating significant and potentially lasting pandemic-induced changes.

3. Hypotheses

Hypothesis Formation: Based on the literature review and the trends observed in the initial research, the study proposes the following hypotheses:

- **H0 (Null Hypothesis):** The COVID-19 pandemic has not significantly altered the frequency of hygiene product usage.
- **HA (Alternative Hypothesis):** The COVID-19 pandemic has significantly altered the frequency of hygiene product usage.

4. Data Overview

- **Description of the Data Collection:** Data for this study was collected through an online survey designed to capture consumer behaviors before and during the COVID-19 pandemic. The survey included questions about the frequency of hygiene product purchases, amounts spent, types of products bought, and perceptions of these products' necessity. The survey garnered 122 responses, providing a cross-sectional view of consumer behaviors.
- **Unit of Analysis:** The primary unit of analysis is the individual consumer. Data points include demographic information such as age, gender, employment status and geographic location, allowing for a detailed analysis of trends across different groups.
- **Strengths and Weaknesses of the Data:** The strengths of the survey data include direct insights from consumers during the pandemic, which offer real-time reflections on their behaviors and attitudes. However, the convenience sampling method may limit the generalizability of the results. The survey's geographic diversity, with responses primarily from the US and India, offers a comparative perspective yet may not fully represent global trends.

5. Variables and Econometric Model

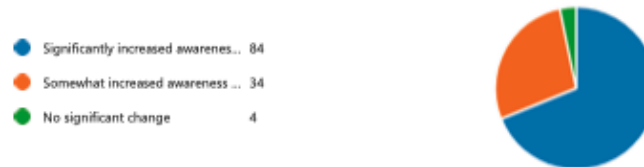
- **Dependent Variables:**
 - Frequency of Hygiene Product Usage
 - Monthly Spending on Hygienic Products
 - Concern for Hygiene
 - Attitudinal Scores Towards Hygiene Practices
- **Independent Variables (Demographic Factors)**
 - Age: 18-61 (Divided into buckets)
 - Gender: Male & Female
 - Employment Status: Student, Homemaker, Retired, Employed, Self-employed, Unemployed, Geographical Location: Mostly India and United States
- **Control Variables:**
 - Pre and post-pandemic Hygiene Habits

13. How has your usage of hygiene products changed since the pre-COVID-19 period? (0 point)



- **Health Awareness**

15. To what extent do you believe the COVID-19 pandemic has impacted awareness and the importance of hygiene practices in preventing the spread of infectious diseases?



- **Data Transformation:**

- We converted columns from a categorical ordinal scale to 1-4 values. We only gave 3 options in the same questions, therefore giving us different scales to use.
- Columns we converted :
 - Hygiene Concern
 - Impact of Covid on people's lives
 - Pre Covid Expenditure
 - Post Covid Expenditure
 - Change of Usage by people
 - Impact in Awareness of people
 - People's feeling on Essentiality of Hygiene Products
 - Switching of brands by people

- **Application of Data Scaling Techniques**

The application of min-max scaling to the survey data was crucial for ensuring the comparability and interpretability of the ordinal responses across different variables measuring the impact of COVID-19 on hygiene practices. By transforming the ordinal scale into a normalized numerical range, ranging from 1 to 3 or 1 to 4, we effectively eliminated the inherent bias and ambiguity associated with qualitative responses such as "Not Concerned," "Neutral," or "Concerned." This transformation facilitated robust statistical analysis, allowing for a deeper understanding of the changes in hygiene-related behaviors, expenditure patterns, awareness levels, and brand preferences before and after the onset of the pandemic.

- **Model Description**

- T-tests:**

- Purpose: T-tests are employed to compare the two groups. In our study, they are used to compare pre-pandemic and post-pandemic spending on hygiene products.
 - Application: Involve comparing the average monthly spending on hygiene products before the pandemic to the average spending after the pandemic began, to see if there has been a statistically significant change.

- Chi-square Tests:**

- Purpose: Chi-square tests are utilized to examine the relationships between categorical variables. In this context, they might be used to test associations between categorical independent variables (like gender or employment status) and categorical outcomes derived from survey responses.
 - Application: For assessing whether the distribution of responses regarding hygiene product usage are even linked or not and to see if there is a correlation between them.

- Multivariate Analysis of Variance (MANOVA):**

- Purpose: MANOVA is used to analyze the impact of the independent variables (age, gender, employment status, geographical location) on multiple dependent variables (frequency of hygiene product usage, monthly spending on hygiene products, and attitudinal scores towards hygiene practices) simultaneously.
 - Why MANOVA: This method is suitable because it allows for the examination of multiple dependent variables and can provide insights into the overall effect of the pandemic, considering all aspects of consumer behavior changes together. It helps in understanding how these variables interact and whether there are any overall patterns across different types of consumer responses.
 - Implementation Details: In this model, each dependent variable is considered simultaneously to understand the collective influence of the independent variables. It helps in detecting differences in multivariate means among groups defined by the independent variables.

- **Statistical Considerations:**

- Specification Issues: Address potential specification issues such as omitted variable bias, where important variables that influence the dependent variables are not included in the model.

- **Sample Representativeness:** Discuss the limitations due to the convenience sampling method used in data collection, which may affect the generalizability of the results.

6. Empirical analysis and findings

• Descriptive Statistics:

- **Demographics:** The survey saw a predominant response from individuals aged 21-30, demonstrating the active engagement of younger adults, alongside a well-balanced gender participation that ensured diverse perspectives.
- **Geographic Distribution:** A significant portion of the responses originated from the USA and India, offering a broad cultural insight into hygiene practices and reflecting varied global behaviors.
- **Changes in Hygiene Product Usage:**
 - **Post-pandemic,** there was a notable increase in hygiene product usage, with 96 respondents reporting heightened usage, highlighting a shift in consumer behavior towards greater health consciousness.
 - **Spending Patterns:** There has been a discernible shift in spending on hygiene products, with more consumers now spending between \$40-\$120, suggesting a substantial adjustment in budget allocations towards health and safety products post-COVID-19.

Survey graphs:

2. What is your age range? (0 point)



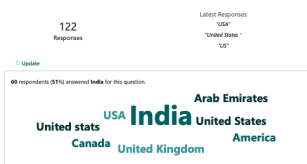
3. What is your gender identity? (0 point)



4. What is your current employment status? (0 point)



5. Which country are you currently residing in? (0 point)



6. How has the COVID-19 pandemic affected your daily life and routines? (0 point)



7. How do you rate your concern about maintaining personal hygiene? (0 point)



8. What kind of hygiene product do you mostly use? (0 point)



9. How frequently do you use hygiene products? (0 point)



10. How much did you spend monthly for hygiene products Pre-COVID-19? (0 point)



11. How much did you spend monthly for hygiene products Post-COVID-19? (0 point)



12. How often do you typically purchase hygiene products? (0 point)



13. How has your usage of hygiene products changed since the pre-COVID-19 period? (0 point)



14. Do you now consider hygiene products as essential household items? (0 point)



15. To what extent do you believe the COVID-19 pandemic has impacted awareness and the importance of hygiene practices in preventing the spread of infectious diseases? (0 point)



- **Inferential Statistics:**

- **Methodology:** The analysis utilized T-tests, Chi-square tests and MANOVA, to assess the impact of COVID-19 on consumer behaviors. These methods were chosen for their ability to handle multiple data types and relationships within the study, ensuring comprehensive analysis of both categorical and continuous data.
- **T-test Results:** P value seen here was $4.87 * 10^{-5}$. This showcases a really low value. T-tests confirmed an association between spending on hygiene products pre and post-pandemic. T value here is -4.81 suggesting a significant difference between mean of expenditure pre and post pandemic.
- **Chi-square Findings:** This test is performed to deepen our understanding of the association between categorical variables. The test found a great relationship. P value was $6.83 * 10^{-6}$. Significant relationships were identified between demographic variables and changes in hygiene habits, highlighting how specific groups have altered their behaviors in response to the pandemic. There was a very strong association between Pre and Post Covid expenditure.
- **MANOVA Findings:**
 - Age Range : p value for Roy's greatest Root is 0.112, signifying Age Range has a major impact on dependent variables.
 - Gender : None of the statistical methods have p values less than 0.05, signaling no direct impact on dependent variables.
 - Country : None of statistical methods have p values less than 0.5, signaling no direct impact on dependent variables.
 - Employment Status: P value for Roy's greatest Root is 0.0061, which is less than 0.05. This signals a direct impact on dependent variables.

Significant impacts were observed on hygiene product usage and spending patterns, suggesting demographic factors like age and employment significantly influenced consumer behavior during the pandemic.

- **Key Findings:**

- **Increased Usage and Expenditure:** There has been a notable rise in both the frequency of usage and the expenditure on hygiene products since the pandemic began. This increase is particularly evident among younger adults and employed individuals, suggesting a potential long-term shift in their purchasing behaviors.
- **Shift in Perceptions:** A significant majority of respondents now view hygiene products as essential, with 75 individuals noting a definitive shift in their perception. This highlights a fundamental change in consumer priorities influenced by COVID-19.

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- **Continued Behavioral Adaptations:** Many respondents indicate an intention to maintain elevated hygiene practices post-pandemic, pointing to a durable impact on consumer behaviors.
 - **Changes in Information Seeking and Brand Preferences:** During the pandemic, social media and online platforms emerged as the main sources of information for hygiene products. Additionally, there has been a noticeable change in brand loyalty, with consumers increasingly switching to brands that maintained availability and demonstrated effectiveness throughout the pandemic

7. Conclusion

The findings from this study corroborate the theoretical predictions seen in earlier literature, confirming a significant, long-term shift in consumer hygiene practices as anticipated by sources like Chan (2020) and Liu et al. (2021). This shift highlights the need for manufacturers and retailers to adapt to increased demand and evolving consumer preferences, suggesting strategies that ensure product availability and address new consumer needs. For policymakers, these results emphasize the importance of integrating enhanced hygiene awareness into ongoing public health initiatives to better equip society for future health challenges.

8. References

- Chan, Amy. (2020). "The Impact of COVID-19 on Consumer Behavior: Will It Change Forever?" *Asia-Pacific Journal of Marketing and Logistics*, 32(4), 941-951.
 - Liu, Jonathan, et al. (2021). "Consumer Behavior During the COVID-19 Pandemic: Online Shopping and Hygiene Habits." *Journal of Retailing and Consumer Services*, 61, 102542.
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Appendices

- Appendix A: Survey Questionnaire

Appendix A: Survey Questionnaire: Titled "Understanding Hygiene Habits & Attitudes in the Post-Pandemic Era"

1. What is your age range?
 - Below 20
 - 21-30
 - 31-40
 - 41-50
 - 51-60
 - 61 above
2. What is your gender identity?
 - Female
 - Male
3. What is your current employment status?
 - Student
 - Homemaker
 - Retired
 - Employed
 - Self-employed
 - Unemployed
4. Which country are you currently residing in?
5. How has the COVID-19 pandemic affected your daily life and routines?
 - Significantly disrupted my daily routines
 - No major impact on my daily routines
 - Actually improved some aspects of my daily routines
6. How do you rate your concern about maintaining personal hygiene?
 - Very concerned
 - Somewhat concerned
 - Neutral
 - Not concerned at all
7. What kind of hygiene product do you mostly use?
 - Mask
 - Gloves
 - Hand sanitizer/Clorox
 - Disinfectant spray

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- Other
8. How frequently do you use hygiene products?
- Several times a week
 - Weekly
 - Monthly
 - Rarely/Never
9. How much did you spend monthly for hygiene products Pre-COVID-19?
- Less than \$40
 - \$40 - \$80
 - \$80 - \$120
 - Above \$120
10. How much did you spend monthly for hygiene products Post-COVID-19?
- Less than \$40
 - \$40-\$80
 - \$80-\$120
 - Above \$120
11. How often do you typically purchase hygiene products?
- Several times a week
 - Weekly
 - Monthly
 - Less frequently (less than once a month)
12. How has your usage of hygiene products changed since the pre-COVID-19 period?
- Increased usage
 - Decreased usage
 - No change in usage
13. Do you now consider hygiene products as essential household items?
- Yes, definitely
 - Yes, to some extent
 - No, not really
 - No, not at all
14. To what extent do you believe the COVID-19 pandemic has impacted awareness and the importance of hygiene practices in preventing the spread of infectious diseases?
- Significantly increased awareness and importance
 - Somewhat increased awareness and importance
 - No significant change
15. How do you primarily obtain information about new hygiene products available on the market?
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- Television advertisements
 - Social media and online platforms
 - Recommendations from friends and family
 - In-store displays and promotions
 - Other

16. In general, what factors influence your decision when purchasing hygiene products? (Select all that apply)

- Brand reputation/trust
- Price
- Availability
- Ingredients/composition
- Recommendations (Health authorities/friends/family)
- Product effectiveness
- Other

17. Did you switch brands or types of hygiene products (e.g., hand sanitizers, disinfectant wipes) since the start of the COVID-19 pandemic?

- Yes
- No

18. To what extent do you believe that good hygiene habits can help to improve overall health and well-being?

- Extremely significant
- Somewhat significant
- Neutral
- Not very significant
- Not significant at all

19. Now that we are in the post-COVID period, do you plan to continue with the same level of precautions regarding hygiene?

- Yes, I will continue with the same precautions
- No, I will reduce my precautions
- Not sure yet, still evaluating