

Consumer behaviour of food products and natural supplements in new normal period-A study with particular reference to Madurai district

¹Mrs. P. Kanidha, ²Dr. M. Ganesan

¹Research scholar

PG & Research Department of Commerce
Raja Doraisingam Govt. Arts College, Sivagangai.

²Associate Professor

PG & Research Department of Commerce
Raja Doraisingam Govt. Arts College,
Affiliated To Alagappa university, Sivagangai.

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Abstract: The pandemic due to COVID-19 has resulted in major changes in the consumer behavior amongst which the eating habits and adding natural supplements are the most significant ones. This study deals with the potential behavioral patterns that consumers may have during the new normal phase with a special focus on the Madurai district. Furthermore, It looks at the factors that have played the most important role in the pattern of people's attitudes towards the trending items in the field of natural and health-related products. Such elements as the adoption of a new lifestyle style, people's understanding of health, and their purchasing preferences are given as the main drivers in this process. Other than that, it shows the up-going number of demands for organic food, the factor of immune-boosting supplements, and the locally sourced products on the other side. In addition, it investigates the impact of technology on designing the consumer's choice of purchases in the period of the pandemic. The survey hope by researching and understanding the alterations in human behavior to add the latest data to businesses and policymakers and thus, help them adapt their strategies to the client's wishes. The overall importance of this study is that it focuses on the changes in consumer behavior during the COVID-19 pandemic in the Madurai district

Keywords: Consumer behavior, food products, natural supplements, new normal period, Madurai district, health awareness, purchasing preferences, organic food, immunity boosters, digital platforms.

1. INTRODUCTION

The COVID-19 pandemic has significantly changed how consumers live and shop around the globe. One of the most noticeable shifts can be found in the food and natural supplement markets, where a greater focus on health and wellness has reshaped priorities. As health awareness takes center stage in our lives, people are actively looking for products that boost immunity and enhance their overall health. Madurai district, celebrated for its rich cultural legacy and rapid urban growth, serves as an intriguing setting to explore these evolving consumer behaviors, merging age-old traditions with modern demands. During the pandemic, food consumption patterns have seen a pivotal transformation, with more consumers leaning towards healthier and eco-friendly options. This new normal has triggered a rise in demand for organic, locally produced, and minimally processed foods. It aligns with a wider trend of preventive healthcare, as individuals aim to strengthen their immunity through dietary changes. Functional foods—those that provide health advantages beyond mere nutrition—are becoming increasingly popular, reshaping the food market landscape. Natural supplements, such as vitamins,

minerals, and herbal products, have become essential to how people approach their health. The fear of illness stemming from the pandemic has led to an extraordinary increase in the use of immunity-boosting supplements. Ingredients like Vitamin C, Zinc, and traditional Ayurvedic remedies have become staples in households, blending contemporary science with traditional knowledge. With Madurai's deep cultural ties to natural remedies, it's a fascinating case for studying this rising dependency on supplements.

Digital platforms have been crucial in influencing consumer choices during this new normal. The surge in e-commerce and online delivery options has made it easier than ever to access food and supplements. Social media and health influencers have also played a role in raising awareness about the importance of nutrition and natural supplements, swaying purchasing habits. In Madurai, the increase in digital connectivity among urban and semi-urban residents has helped close the gap between traditional marketplaces and modern retail outlets. Another key factor affecting how people choose to spend is the economic impact of the pandemic. While awareness around health has grown, economic uncertainties have led many to spend more cautiously. People are prioritizing essential health and wellness goods over luxury items. In Madurai, where income levels and buying power can differ greatly across demographics, this careful budgeting sheds light on changing consumer priorities in the post-pandemic landscape.

We also must consider the psychological effects of the pandemic when analyzing consumer behavior. Concerns about infection, long-term health worries, and heightened stress levels have all influenced food and supplement selections. There's been a noticeable comeback of comfort foods, which provide a sense of indulgence or nostalgia, alongside a growing interest in health-oriented products. This mix of emotional and rational decision-making gives us a clearer picture of consumer preferences in this new normal.

Cultural and regional factors significantly impact how people consume food and supplements. In Madurai, the local diet and natural remedies have historically been key components of daily life. The pandemic has reinforced these traditional approaches, sparking renewed interest in herbal teas, medicinal spices, and home remedies. At the same time, the rise of global health trends—like superfoods and probiotics—illustrates a blend of tradition and modernity in consumer choices.

This study aims to thoroughly analyze consumer behavior toward food products and natural supplements during this new normal, focusing specifically on the Madurai district. By looking into the interplay of health awareness, digital influences, economic situations, and cultural practices, the research seeks to identify trends and drivers that are influencing consumer preferences. The findings should provide valuable insights for businesses, policymakers, and health professionals, enabling them to better address the changing needs of consumers in a post-pandemic world.

2. REVIEW OF LITERATURE

The review of literature highlights existing studies on various themes such as mental health, nutrition, gender studies, and entrepreneurship, providing a basis for identifying research gaps relevant to the study at hand.

S. Poulpunitha, K. Manimekalai, and P. Veeramani (2020) conducted a "Happiness Audit Among Female Students in a Higher Education Institution" at Alagappa University, Karaikudi. The study explored the psychological well-being of female students, emphasizing factors such as academic stress, peer relationships, and institutional support. It highlighted the need for integrating mental health programs within educational institutions to improve the happiness quotient among students.

The role of policies in fostering women entrepreneurship was examined by Shanlax International Journal of Arts, Science, and Humanities (2016). The study provided insights into how governmental and institutional support schemes contribute to empowering women entrepreneurs. However, it underlined a lack of gender-specific initiatives in rural and semi-urban regions, which could hinder equitable access to resources and support.

P. Sindhuja and K. R. Murugan (2020) investigated "The Malaise of Malnutrition in India" through a meta-analysis. Their work shed light on nutritional deficiencies affecting women and children, with a particular focus on socio-economic disparities. It called for targeted interventions addressing the root causes of malnutrition, such as poverty, lack of awareness, and insufficient healthcare infrastructure.

Objective of the Study

To analyze the changing consumer behavior toward food products and natural supplements in the new normal period with a specific focus on the Madurai district.

To examine the factors influencing the increased preference for health-oriented and immunity-boosting products during the post-pandemic period.

To assess the role of digital platforms and e-commerce in shaping purchasing decisions for food and natural supplements in the Madurai district.

Strategies to combat domestic violence were explored by Prof. K. Manimekalai and Dr. S. Poulpunitha (2017) in their study published in the *International Journal of Applied Research*. They proposed community-based approaches and legal frameworks to mitigate violence against women, stressing the importance of educational campaigns to alter societal perceptions.

Prof. K. Manimekalai and P. Sindhuja (2019) emphasized "Mainstreaming Gender in Environment – A Path for Sustainable Development." This study established the interconnection between gender equity and sustainable development, advocating for the inclusion of women in environmental decision-making processes. It highlighted the lack of gender-specific policies in addressing environmental challenges.

Jacob and Petel (2014) explored classifications in mental disorders, offering an understanding of the evolving paradigms in mental health research. Their work on identifying the spectrum of mental health issues set the stage for further studies on coping mechanisms and therapeutic interventions.

James Gardner (2013) analyzed mental health frameworks, focusing on the importance of early intervention and comprehensive care models. His work underscored the critical role of education and awareness in destigmatizing mental illnesses.

India Today (January 2021) documented the socio-economic impacts of the COVID-19 pandemic on various sectors, including health and entrepreneurship. The report highlighted the widening gender disparities during the pandemic, particularly in access to healthcare and employment opportunities.

Jenmiller (2023) provided a detailed review of supplements that could potentially aid in alleviating depression. This study reinforced the growing interest in natural remedies and supplements, drawing attention to the lack of standardized research on their efficacy and safety.

Research Gap: While extensive studies exist on nutrition, mental health, domestic violence, and gender empowerment, gaps persist in understanding the intersectionality of these themes. The impact of the COVID-19 pandemic has added new dimensions to these areas, particularly in the context of rural and semi-urban populations. Moreover, limited research has been conducted on region-specific challenges, such as those in Madurai district, that integrate mental health, nutrition, and gender studies. Addressing these gaps could offer a holistic understanding of consumer behaviour and policy effectiveness in the new normal period.

3. METHODOLOGY

This study uses a descriptive research design to explore how consumers behave toward food products and natural supplements during the new normal in the Madurai district. This method allows us to look at trends, preferences, and the factors that influence choices in a systematic way.

To employ a stratified random sampling technique to ensure that we capture a representative cross-section of different demographics, including age, gender, education, income levels, and where people live (urban, semi-urban, and rural) within the Madurai district.

To survey 300 respondents, which will provide a solid basis for statistical analysis and help us generalize our findings. To gather data using structured questionnaires and interviews. The questionnaire will feature both closed-ended and open-ended questions, allowing us to gather both quantitative and qualitative insights. The researcher reviews the existing literature, government reports, research articles on food consumption and natural supplements to support this analysis. The study adopted the Descriptive statistics (like mean, median, and standard deviation) will help us summarize the data. To use inferential statistical tests such as regression analysis to investigate the relationships between variables. This study zeroes in on residents of the Madurai district, looking into how socio-economic factors, health awareness, cultural practices, and digital influences affect their behaviour in the current new normal.

Limitations: The findings are geographically confined to the Madurai district, meaning they might not reflect trends in other areas. Since responses are self-reported, they could be subject to biases or inaccuracies. To uphold ethical standards by securing informed consent from participants, ensuring their confidentiality, and using the data strictly for academic purposes.

Percentage Analysis-Demographic Profile of the Respondents

The table presents the demographic profile of 300 respondents from Madurai district, categorized by gender, age group, education, occupation, income, and residential area. It provides a comprehensive overview of the diverse characteristics of the participants relevant to the study on consumer behavior toward food products and natural supplements in the new normal period.

Table 1: Demographic Profile of the Respondents

Demographic Variable	Categories	Frequency	Percentage
Gender	Male	120	40%
	Female	180	60%
Age Group	Below 20 years	50	16.70%
	21–30 years	90	30%
	31–40 years	70	23.30%
	41–50 years	50	16.70%
	Above 50 years	40	13.30%
Educational Qualification	No Formal Education	10	3.30%
	Primary School	30	10%
	Secondary School	80	26.70%
	Undergraduate	120	40%
	Postgraduate	60	20%
Occupation	Student	60	20%
	Homemaker	50	16.70%
	Self-employed	40	13.30%
	Government Employee	60	20%
	Private Employee	70	23.30%
	Retired	20	6.70%
Monthly Income	Below ₹10,000	40	13.30%
	₹10,001–₹30,000	100	33.30%
	₹30,001–₹50,000	90	30%
	₹50,001–₹70,000	40	13.40%
	Above ₹70,000	30	10%
Residential Area	Urban	120	40%
	Semi-Urban	100	33.30%
	Rural	80	26.70%

Source: Primary data

The demographic analysis of 300 respondents highlights a diverse composition, with a majority being females (60%) and most falling in the 21–30 years age group (30%), followed by those aged 31–40 years (23.3%). Educational qualifications indicate a highly educated sample, as 40% are undergraduates, and 20% are postgraduates, reflecting a well-informed group likely to be conscious about health and nutrition. Occupation-wise, private employees (23.3%), students (20%), and government employees (20%) dominate, showcasing varied professional backgrounds. Monthly income levels are concentrated in the middle-income groups, with 33.3% earning ₹10,001–₹30,000 and 30% in the ₹30,001–₹50,000 range, signifying a moderate spending capacity on food and natural supplements.

Residential area distribution reveals that 40% of respondents are from urban regions, followed by 33.3% from semi-urban, and 26.7% from rural areas. This indicates widespread interest across different locales, though urban areas show slightly higher representation. Overall, the demographic diversity in gender, age, education, and occupation provides a comprehensive foundation for understanding consumer behavior toward food products and natural supplements in Madurai district during the new normal period.

Table 2: Percentage Analysis of Consumer behaviour of food products and natural supplements in new normal period

Question	Options	Frequency	Percentage
What types of food products do you consume regularly?	Fresh fruits and vegetables	120	40%
	Packaged foods/snacks	90	30%
	Organic foods	50	16.70%
	Processed foods	40	13.30%
Do you include natural supplements in your diet?	Yes	180	60%
	No	120	40%
Which types of supplements do you use?	Vitamin tablets	110	36.70%
	Herbal supplements	80	26.70%
	Protein powders	40	13.30%
	Immunity boosters	70	23.30%
Where do you usually buy food products and supplements?	Local markets	100	33.30%
	Supermarkets	80	26.70%
	Online platforms	70	23.30%
	Pharmacies	50	16.70%
What factors influence your choice?	Quality	120	40%
	Price	90	30%
	Brand reputation	50	16.70%
	Health benefits	40	13.30%
Did the pandemic influence your purchase behavior?	Yes	200	66.70%
	No	100	33.30%
What changes have you made post-pandemic?	Increased consumption of immunity boosters	120	40%
	Switched to organic/natural food	90	30%
	Reduced processed food consumption	50	16.70%
	Increased online purchases	40	13.30%
Are you satisfied with the availability of natural supplements?	Yes	190	63.30%
	No	110	36.70%
What challenges do you face?	High cost	120	40%
	Limited availability	80	26.70%
	Lack of awareness	60	20%
	Difficulty finding trusted brands	40	13.30%

Source: Primary data

The findings of the analysis indicate that eating fresh fruits and vegetables regularly is chosen by most of the respondents (40%) and it is a healthier food they prefer to. Natural supplements are embodied in the diet of 60% of respondents, and vitamin tablets (36.7%) are the most used supplement among them. Local markets (33.3%) are the main places of selling food and supplements with supermarkets and online platforms in the second and third places respectively.

The most important thing that influences the purchasing activities of 40% of the respondents is quality. Additionally, the pandemic is worth noting as being the main factor in purchase behavior changes for 66.7%, which led to such changes including a 40% increase in the consumption of immunomodulators and a choice of organic or natural food among 30%. In spite of 63.3% having shown content in the supplement availability, there are still bottlenecks such as high costs (40%) and the availability (26.7%) of supplements in the market.

Frequency Distribution of the Attributes of Consumer behaviour of food products and natural supplements in new normal period

Table 3: Consumer behaviour of food products and natural supplements in new normal period

Particulars	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I prefer consuming fresh fruits and vegetables over processed foods.	36	36	16	107	105	300
I believe natural supplements are essential for maintaining good health.	99	67	37	74	23	300
I have increased my consumption of immunity-boosting foods after the pandemic.	151	67	34	32	16	300
I actively look for organic food products in the market.	36	14	18	71	161	300
The pandemic has influenced my preference for healthier food and supplements.	14	15	30	53	188	300
I am satisfied with the variety of food products available in local markets.	48	88	33	55	76	300
Online platforms provide a convenient option for purchasing food and supplements.	53	53	41	69	84	300
The price of natural supplements is a significant factor in my purchasing decision.	191	82	6	15	6	300
I trust the quality of supplements purchased from pharmacies over other sources.	44	66	36	63	91	300
Brand reputation plays an important role in choosing food products and supplements.	47	32	0	104	117	300
I feel that natural supplements are easily available in my area.	16	15	4	68	197	300
The health benefits of a product strongly influence my decision to purchase it.	43	35	44	106	72	300
I have reduced my consumption of packaged or processed foods post-pandemic.	57	49	14	87	93	300
I feel there is enough awareness about the benefits of natural supplements in society.	43	56	31	66	104	300
I face challenges in finding trusted brands for natural supplements and food products.	24	86	22	90	78	300

Source: Primary data

The data shows how people feel about food and supplement choices. Many want healthier natural options and like to shop online. Most people (107+105) pick fresh fruits and veggies over processed foods. This points to a liking for natural wholesome diets. Also, a lot of folks (188) think the pandemic has changed their views on healthier food and supplements.

Some people doubt if natural supplements are needed (99 disagree, 67 disagree). But most (188) say they now pay more attention to their food and supplement picks after the pandemic. Many also like organic food, with 161 saying they try to buy organic products.

When it comes to buying things online, 84 people who answered the survey think online stores provide an easy way to buy food and supplements. Cost still has a big impact on how people decide to buy natural supplements (191 disagree, 82 disagree), and how well-known a brand is also affects what consumers choose (117 agree, 104 agree).

Multi-Layer Perceptron- Neural Networking

The case processing summary indicates that the total sample size is 300, with 217 cases (72.3%) allocated to the training set and 83 cases (27.7%) allocated to the testing set.

Table 4: Case Processing Summary

Particulars		N	Percent
Sample	Training	217	72.3%
	Testing	83	27.7%
Valid		300	100.0%
Excluded		0	
Total		300	

Source: Primary data

All 300 cases are valid and included in the analysis, with no cases excluded. This distribution suggests a typical split for model training and testing, with the majority of the data used for training and a smaller portion reserved for testing the model's performance.

Table 5: Network Information

Input Layer	Factors	1	What types of food products do you consume regularly?
		2	Do you include natural supplements in your diet?
		3	Which types of supplements do you use?
		4	Where do you usually buy food products and supplements?
		5	What factors influence your choice?
		6	Did the pandemic influence your purchase behavior?
		7	What changes have you made post-pandemic?
	Covariates	1	I face challenges in finding trusted brands for natural supplements and food products.
	Number of Units ^a	26	
	Rescaling Method for Covariates	Standardized	
Hidden Layer(s)	Number of Hidden Layers	1	
	Number of Units in Hidden Layer 1 ^a	2	
Output Layer	Activation Function	Hyperbolic tangent	
	Dependent Variables	1	Supplement_Product
	Number of Units	29	
	Activation Function	Softmax	
	Error Function		Cross-entropy

a. Excluding the bias unit

The network setup outlined shows the makeup of a neural network model created to predict supplement product selections. The input layer has 7 factors, which include questions about food items natural supplements buying habits, and changes after the pandemic. One covariate captures issues in finding trusted brands for these products, with a total of 26 input units. The model scales the covariates to standardize them.

The model uses a single hidden layer with 2 units and applies the hyperbolic tangent function to add non-linearity. This function serves as the activation function. The output layer contains one dependent variable—Supplement_Product—with 29 units. It uses the softmax activation function to handle a multi-class classification problem. The model uses cross-entropy as its error function, which is common for classification tasks. The "a" note points out that the bias unit isn't counted in the input layer's unit count.

Table 6: Model Summary

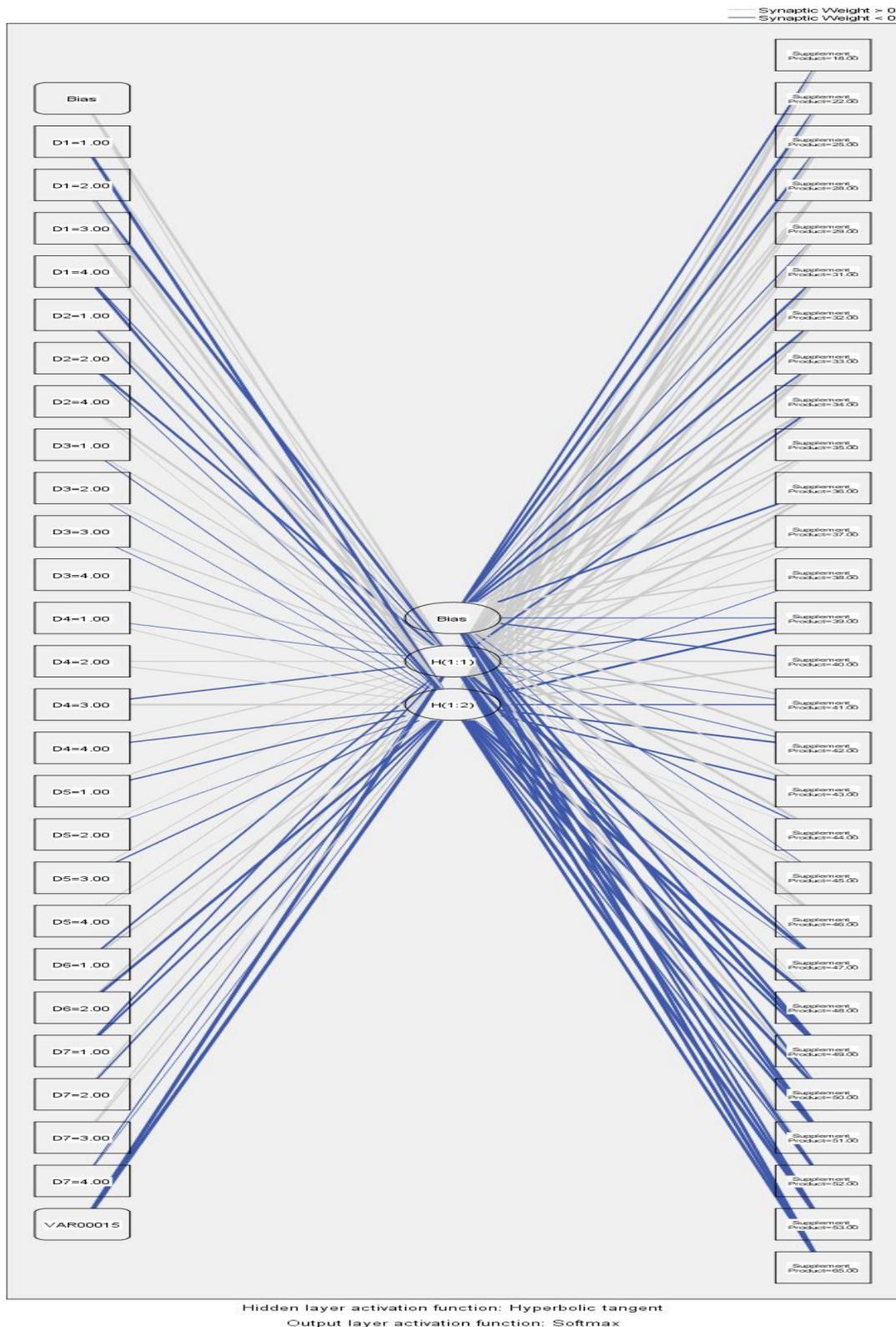
Training	Cross Entropy Error	151.408
	Percent Incorrect Predictions	28.5%
	Stopping Rule Used	1 consecutive step(s) with no decrease in error ^a
	Training Time	0:00:45.11
Testing	Cross Entropy Error	124.089
	Percent Incorrect Predictions	19.2%

Dependent Variable: Supplement_Product

a. Error computations are based on the testing sample.

The model shows a decent level of performance. Its Training Cross Entropy Error stands at 151.408, which suggests it's making headway in grasping the data's patterns. The training data has a Percent Incorrect Predictions of 28.5%. This error rate is middling hinting that while the model does pretty well, there's room to get better. When it comes to testing, the Cross Entropy Error is 124.089, with a 19.2% Percent Incorrect Predictions. These numbers tell us the model can apply what it's learned to new unfamiliar data quite well. Looking at these figures, we can say the model fits the data okay, but tweaking it more could boost its accuracy and cut down on errors.

Figure 1: Multi-Layer Perceptron- Neural Networking



4. RECOMMENDATIONS AND POLICY IMPLICATIONS

1. **Educational Initiatives:** Addressing the knowledge gap regarding natural supplements is crucial, with 20% of respondents indicating limited awareness. This necessitates collaborative efforts between governmental bodies, non-profit organizations, and industry stakeholders to enhance public understanding.
2. **Price Accessibility:** The relatively high cost of natural supplements presents a significant barrier to adoption. Government intervention through manufacturer subsidies or price regulations on essential supplements could enhance affordability and accessibility.
3. **Distribution Enhancement:** Improving the distribution infrastructure for natural supplements in underserved areas is essential. Partnerships with local retailers and expansion of e-commerce capabilities could facilitate broader access to these products.
4. **Quality Assurance Programs:** Supporting the development and implementation of certification programs and quality assurance initiatives can help build consumer confidence in established brands, effectively addressing trust-related concerns.
5. **Pandemic-Driven Market Evolution:** Policymakers should capitalize on the heightened health consciousness emerging from the pandemic by promoting immune-boosting foods and supplements. Strategic support for small-scale enterprises and local organic farms through targeted initiatives can help meet the increasing consumer demand for natural, health-oriented products.

5. CONCLUSION

The survey findings reveal fascinating insights into how individuals are approaching nutrition and dietary supplements in the post-pandemic landscape. A significant portion, approximately 40% of respondents, demonstrate a clear preference for fresh, whole foods over processed alternatives, indicating a positive shift toward healthier eating habits. Furthermore, a considerable 60% of participants regularly incorporate natural supplements into their routines, with vitamin supplements emerging as the most popular choice at 36.7%. The pandemic substantially impacted shopping behaviors, with 66.7% of respondents reporting modified purchasing patterns. This shift manifested in increased consumption of immunity-boosting products (40%) and a greater emphasis on natural, organic food choices (30%).

Product quality emerges as the primary purchasing factor, accounting for 40% of consumer decisions, followed by price considerations at 30%. Local retailers serve as the preferred source for food and supplements for 33.3% of respondents, though supermarkets and e-commerce platforms maintain significant market shares. While 63.3% of participants express satisfaction with supplement availability, several challenges persist. Cost remains a significant barrier for 40% of consumers, while 26.7% face limited product options, and 13.3% struggle with brand reliability concerns.

To wrap things up, a comprehensive approach combining consumer education, financial incentives, and supply chain optimization is essential to address existing challenges and leverage the growing health-conscious consumer base. Successfully implementing these strategic initiatives will enhance accessibility to nutritious foods and supplements while fostering long-term public health benefits.

REFERENCES

- [1] S.Poulpunitha, K.Manimekalai & P.Veeramani. (2020) Happiness Audit Among Female Students in a Higher Education Institution, Alagappa University, Karaikudi, India, Journal of International Women's Studies, Bridgewater State University, Volume 21 Issue 6,
- [2] Schemes and policies for fostering women entrepreneurship, Shanlax international journal of Arts, Science and Humanities, A Peer – Reviewed – Refereed / Scholarly Quarterly Journal, ISBN – 2321-788X, March 2016, Impact Factor 2.9
- [3] P. Sindhuja & K.R. Murugan(2020),The Malaise of Malnutrition in India - A Meta Analysis Study, , Women's Health and Safety in India, Kalpaz Publication, ISBN:9789353242701,pp 29-37.

- [4] Prof.K.Manimekalai & Dr.S.Poulpunitha (2017) Strategies for Preventing Domestic Violence, UGC Approved International Journal of Applied Research; 3(7):960 964, ISSN Print 2394-7500, ISSN Online 2394 – 5869, Impact Factor 5.2
- [5] Prof. K. Manimekalai & P. Sindhuja (2019), Mainstreaming Gender in Environment – A Path for Sustainable Development, , Clean India for New India, MJP ISBN: 978-81-8094-323-2,pp 25-31P.
- [6] Jacob.k, petel.v, (2014) classification in mental disorder. who.int/mental health.com.23 30.
- [7] James Gardner, M.D, (2013) viva books private limited, New Delhi, page no (44to 45).
- [8] January 2021 (during the pandemic). INDIA TODAY <https://www.indiatoday.in>
- [9] Jenmiller (director), supplements to consider for help with depression (2023).