

**"KNOWLEDGE ATTITUDE AND PRACTISE TOWARDS
MULTIVITAMIN SUPPLEMENTS AMONG GENERAL
POPULATION OF INDIA"**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

In

Pharmaceutical Management

by

Prerna Bhama

Under the Supervision and Guidance of:

Mr. Rahul Sharma

(Assistant Professor)

(School of Pharmaceutical Management)

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “Knowledge Attitude and Practise towards Multivitamin Supplements among General Population” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Prerna Bhama

29/06/2021

COMPLETION CERTIFICATION

This is to certify that Prerna Bhama in partial fulfillment of the requirements for the award of the degree of MBA Pharmaceutical Management from the IIHMR University, Jaipur has successfully completed her internship at Procter & Gamble Health Limited. during March 22, 2021, to June 19, 2021.

Place: Jaipur

Date: 29/06/2021

Preceptor/Head of the Organization

Procter & Gamble Health Limited

ACKNOWLEDGEMENT

Firstly, I would like to thank God whose grace is with us at every step. Any attempt at any level cannot be satisfactorily completed without the Guidance and support. And so, I would like to express my special thanks of Gratitude to my Mentors **Mr. Rahul Sharma** (Assistant Professor of school of Pharmaceutical Management) and **Mr. Hameed Khan** (Zonal Sales Manager in Procter & Gamble Health Limited) for their consistent guidance, encouragement, at every step throughout completing this Research work despite of their busy schedule.

I also want to thank to the teaching as well as non-teaching staff for their help and consistent support.

Finally, I want to thank and acknowledge to my Parents and friends for their love, support, helping in collection of data for my Project.

Thankyou.

Prerna Bhama

MBA-PM (11)

Table of Contents-

Cover page.....	1
Declaration by Student.....	2
Completion Certification.....	3
Acknowledgement.....	4
Table of content.....	5
Introduction.....	6
Literature Review.....	7
Research Objective.....	9
Research Methodology.....	10
Results and analysis.....	11
Discussion.....	23
Conclusion.....	24
Limitation.....	24
Recommendation.....	25
References.....	26
Annexure.....	30

INTRODUCTION:

The first case of COVID-19, thereupon named SARS-CoV-2 were first observed in Wuhan City, China in December 2019. SARS-CoV-2 originated in bats, and this virus has spread worldwide resulting in massive number of deaths and posed a serious risk to public health, leading to loss of immunity to greater level (1). This outbreak has led to rapidly increasing the use of dietary supplements all over the world, due to which there is surge in demand for dietary supplements in the wake of this outbreak. During COVID-19 Pandemic, interests and consumption of Immunity Boosters such as Vitamin-C, Vitamin-D, Zinc, and Selenium, Omega-3, ginger, garlic, turmeric has increased for defending the body against the infection, to support the immune Health, and to reduce the anxiety in the period of the COVID-19 Pandemic. Though there are scant and no convincing studies that highlights the role and support of Dietary Supplements in COVID-19 Prevention and treatment in healthy, well equipped with nourishment in an individual. Hence, probability of risks of increasing intake of Multivitamin Supplements exists, and education for intake of multivitamin supplements rationally, must be provided to the consumers(2). Disturbing is that large number of people are consuming Dietary Supplements without any deficiency symptoms, and their effectiveness in such conditions is questioned. However, people should not rely completely on dietary supplements by skipping or avoiding a balanced diet, instead maintain a balanced amount of nutrient in the body, so to correct the deficiency (3). An optimally functioning immune system is having adequate supply of micronutrients to the body, while if having a severe deficiencies of micronutrients, gives rise to weakened immune response and vulnerability to the infections (4). Keeping in mind the current COVID situation, nutrients that can enhance the immunity to decrease the chance of severe progression and prognosis of this viral infections. The evidence reflects that deficiency of one or more of these three elements affects the immune responses.(5)The Internet has played a vital role in getting information related to Corona Virus Outbreak, Dietary habits and Multivitamin Supplements(6).

LITERATURE REVIEW:

The impact of Coronavirus infection that has caused COVID-19 associated with increased in mortality rate in the patients and socioeconomic disruption globally (7). With related to the alteration of the immunity during Coronavirus infection, majorly patients suffered from Lymphopenia with or without decreased leukocyte counts, which significantly leads to pro-inflammatory factors. Hence, this dangerous acute respiratory distress syndrome (ARDS) due to the cytokine storm is associated with increased mortality rate in the patients(8). In the wake of COVID-19, Dietary supplements consisting of vitamins and micronutrients helps in boosting the immune system, and these are affordable and effective adjuvant approach for treating the acute respiratory tract complications of COVID-19 (9).

Potential Role of Multivitamin Supplements in COVID-19 Management:

Vitamin – C:

The Vitamin is also known as ascorbic acid. It's a water soluble, a significant nutrient, an immunomodulator agent which gives stimulating effects on Interferon formation, Lymphocyte proliferation support, and increasing the phagocytic ability of Neutrophils, included in several enzymatic processes in the immune system and has additionally other physiological function in the human body(10). Various formulations of Vitamin - C are available as oral dosage form for administering orally. Moreover, when Vitamin – C is to be taken in a higher dose, then Parenteral administration should be advised(11). One of the well-known function of Vitamin – C has an antioxidant Activity, thus helps in attenuating lung inflammation in COVID Infection(12).

Vitamin – D:

Vitamin – D comes under a group of Lipid-Soluble Micronutrients(13). Vitamin – D exerts its immuno- modulatory activity by decreasing pro-inflammatory cytokines(14). Vitamin – D also provides action by preserving cell junctions, modulating adaptive immunity, and consolidation of cellular immunity. It provides modulatory action on adaptive immunity by resisting responses of T- helper cell type 1 and speeding up the induction of T – regulatory cells(15). However, Vitamin – D deficiency means having life threatening factor for severity of Corona infection(16).

Melatonin:

Melatonin is considered as the classical night time hormone, secreted by pineal gland(17). Melatonin is having powerful antioxidant and anti-inflammatory property. The regulation of Immune system is managed by circadian rhythm which is modulated by pineal melatonin. Therefore, various condition which includes fatal viral infections, wherein pineal melatonin gets decreased, might affect the immune system of hosts and evidence reflects that the severe viral infection load, might suppress the production of pineal melatonin(18).

Selenium:

Selenium is a vital trace element, potent nutritional antioxidant(19). Selenium exerts its action by binding with selenoproteins wherein it plays a vital role in decreasing the oxidative stress. Normally lack of Selenium and Selenoproteins Polymorphisms leads to Immune System Dysfunction in an individual. And so Selenium Supplementation is very Mandatory to improve the immunity levels(19). In short, Lack of Selenium affects in several manner, including mutations, replication, and virulence. Hence, selenium plays a crucial contribution in COVID-19 Management(20).

Zinc:

Zinc is a metal, important for many biological processes, including Lipid Metabolism, Carbohydrate Metabolism(21). Zinc is involved in the regulation and formation of immune system and inflammatory responses. Therefore, zinc involvement in immune system function is obvious(22).

RESEARCH OBJECTIVE:

- To assess the use of Multivitamin Supplements among General Population of India.
- To understand knowledge, attitude towards Multivitamin Supplements among General Population of India

Research methodology:

Type of Research: Descriptive Study

Data Collection: Primary data was collected from general population throughout the Pan India. Secondary data was collected from PubMed Articles, Published journals, Google Scholar etc.

Duration: 22/03/2021 – 19/06/2021

Sample Size: 250 citizens

Data Analysis: The data analysis had been done by using Microsoft Excel.

Inclusion Criterion: All participants including COVID, Non-COVID Patients, Comorbid, Non-Comorbid Patients, Pregnant, Non-Pregnant Women, TB, Non-TB Patients, Fever, Non-Fever Patients, Diabetic, Non-Diabetic Patients are included in this study.

Exclusion criterion: Participants with psychological illnesses, participants who are not willing to participate in this study are excluded.

Study Area: Pan India.

Data Collection Method:

- **Primary Data Collection:** A Pretested Structured Questionnaires was framed for Data Collection from General Population of India.
- **Secondary Data Collection:** Journals, PubMed Articles, Google Scholar etc.

Data Collection and Analysis:

The responses obtained was collected, filtered, and statistically analysed using Microsoft Excel.

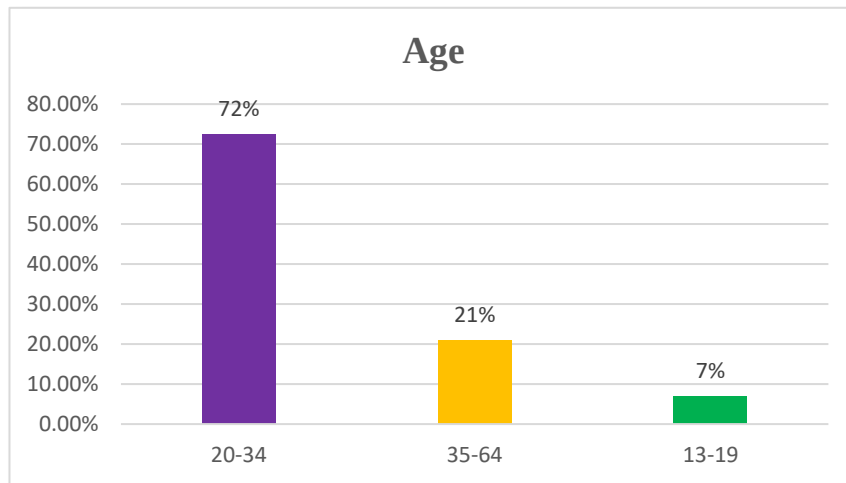
Measure of Ethics: Respondents were assured of Privacy and Confidentiality.

RESULTS AND ANALYSIS OF QUESTIONNAIRES:

Interpretation of Data:

The below Graph depicts that,

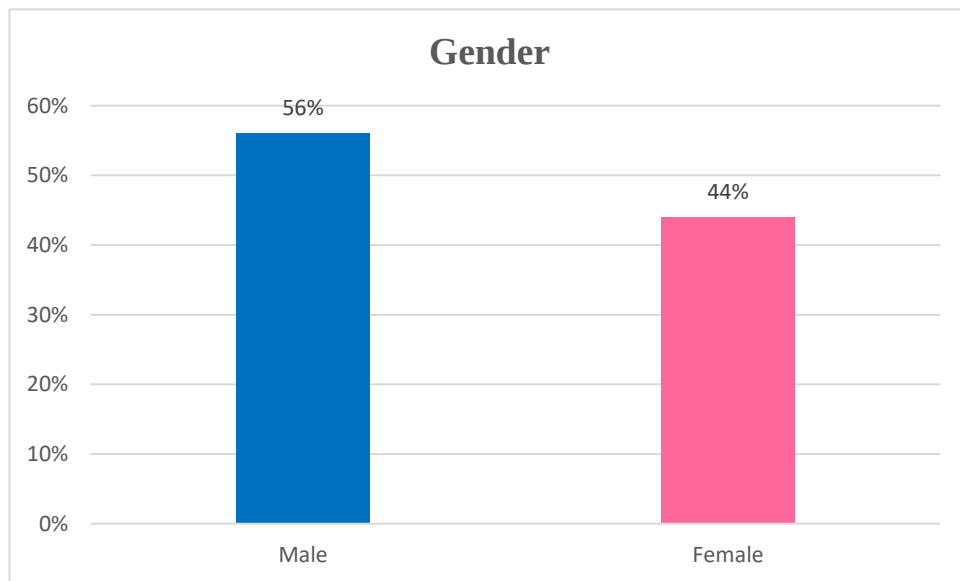
Maximum respondent (72%) is of under 20-34 years of Age, followed by 21% are of between 35-64 years of Age, then 7% are of between 13-19 years of Age group.



The below Graph depicts that,

Maximum Respondent (56%) are Male.

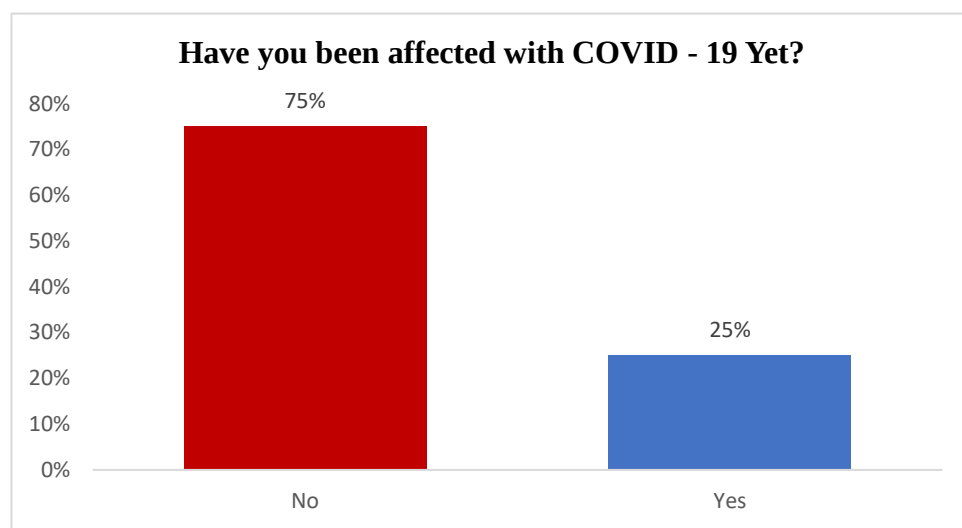
44% Respondents are Female.



The below Graph depicts that,

Maximum participants 75%, has not been affected with COVID-19 yet.

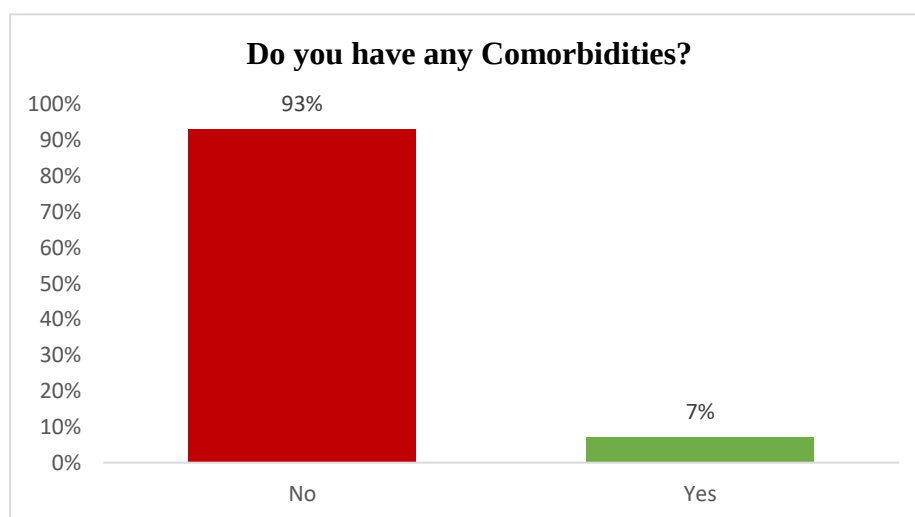
Minimum Percentage of Respondents 25% has been affected with COVID-19.



The below Graph depicts that,

Maximum Respondents 93%, not dealing with Comorbidities.

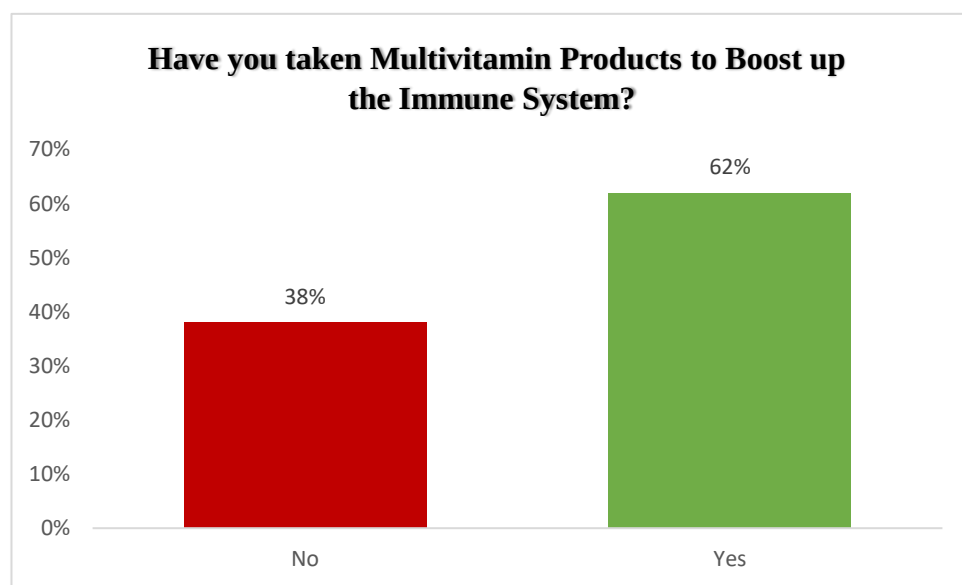
A small percentage 7% of them is dealing with comorbidities.



The below Graph depicts that,

Maximum Respondents 62% took Multivitamin Products to Boost up the immunity levels.

Minimum Respondents 38% did not take Multivitamin Supplements to boost up the Immunity levels.



The below Table depicts the comparison between two above questions:

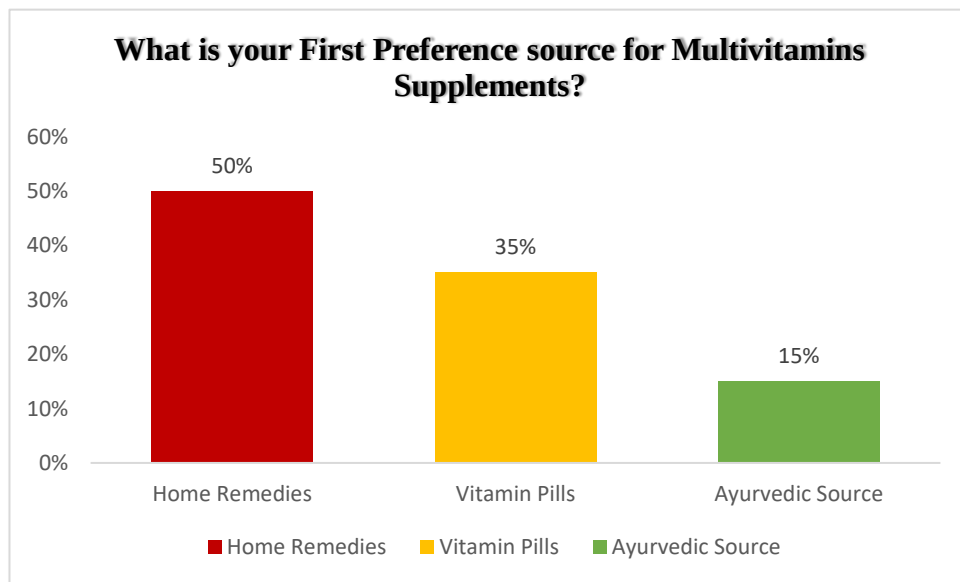
It is showing that, **Maximum Respondents (75%)** has not been affected with COVID-19 Yet, but still **Maximum Respondents 62%** has taken Multivitamin Supplementation either Prophylactically or because of persistent fear in their minds of becoming COVID Positive in Future, or may be the other reason is, this outbreak has brought Multivitamins into the limelight to boost up the immunity levels, that's why people started consuming it to a large extent.

Table 1

	Yes	No
Have you been affected with COVID-19 Yet?	62 (25%)	188 (75%)
Have you taken Multivitamin Products to Boost up the Immune System?	154 (62%)	96 (38%)

The below Graph depicts that,

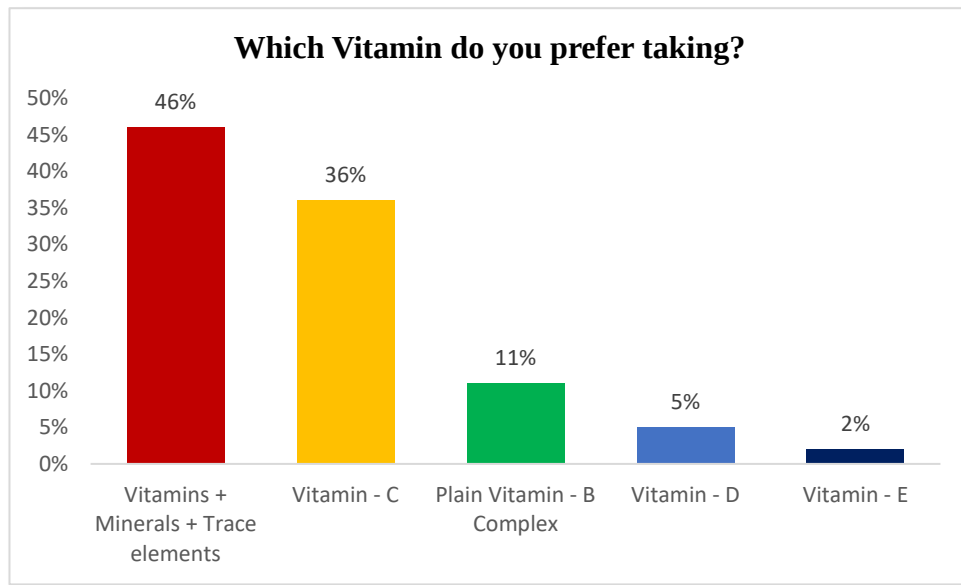
- **Maximum Respondents (50%)** is having Home Remedies as a first preference source for Multivitamin Supplementation.
- Followed by **35% Respondents** is having Vitamin Pills (Allopathic Source) as a first preference source for Multivitamin Supplementation.
- Then only **15% Respondents** is having Ayurvedic Source as First preference source for Multivitamin Supplementation.



The below Graph depicts that,

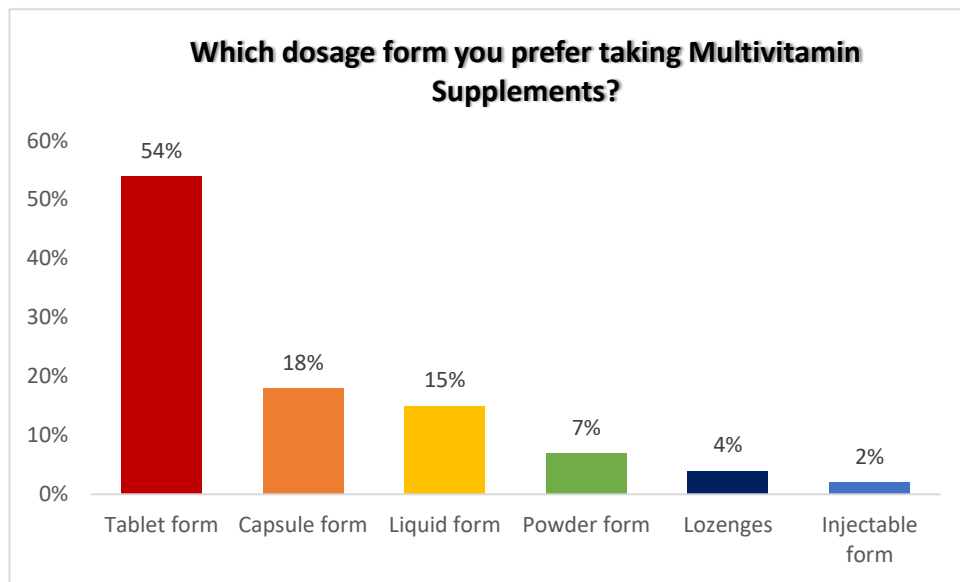
- **Maximum Respondents (46%),** Prefer taking Vitamins + Minerals + Trace elements.
- **36% Respondents** Prefer Taking Vitamin – C.
- **11% Respondents** Prefer taking Vitamin – Plain Vitamin – B Complex.
- **5% Respondents** Prefer taking Vitamin – D.

- **2% Respondents** Prefer taking Vitamin – E.



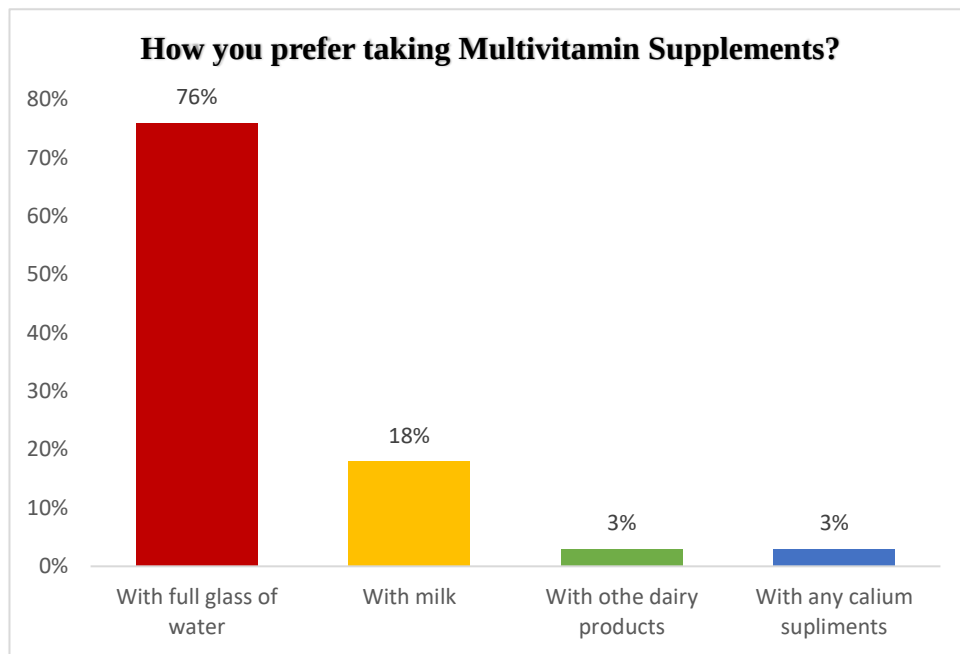
In the below Graph, it is depicting that,

- **Maximum Respondents 54%,** prefer taking Multivitamins in a Tablet Form.
- **18% Respondents,** prefer taking Multivitamins in a Capsule Form.
- **15% Respondents,** prefer taking Multivitamins in a Liquid Form.
- **7% Respondents,** prefer taking Multivitamins in a Powder Form.
- **4% Respondents,** prefer taking Multivitamins in a Lozenges Form.
- **2% Respondents,** prefer taking Multivitamins in an Injectable Form.



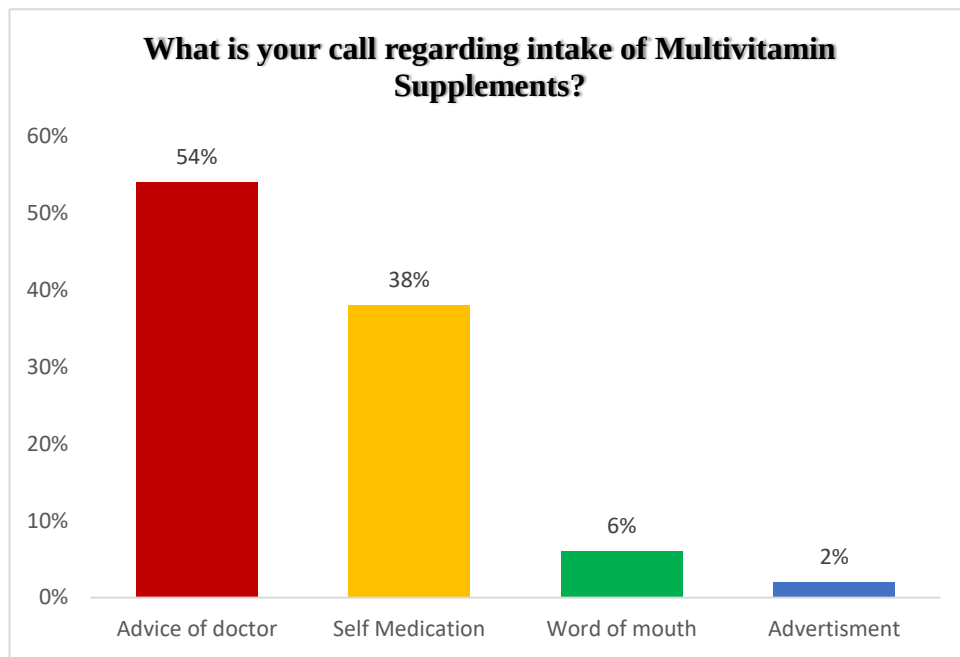
In the below Graph, it is depicting that,

- **Maximum Respondents (76%)** takes Multivitamin Supplements with full glass of Water.
 - **18% Respondents** takes Multivitamin Supplements with Milk.
 - **3% Respondents** takes Multivitamin Supplements with other dairy products.
 - **3% Respondents** takes Multivitamin Supplements with any Calcium Supplements.
- Stills there is a lack of knowledge regarding interaction occurs when administered Multivitamin with either Milk, or calcium supplements, or any of the dairy products. If taken, so these all contain calcium which will make harder for the body to absorb certain ingredients of the multivitamins.



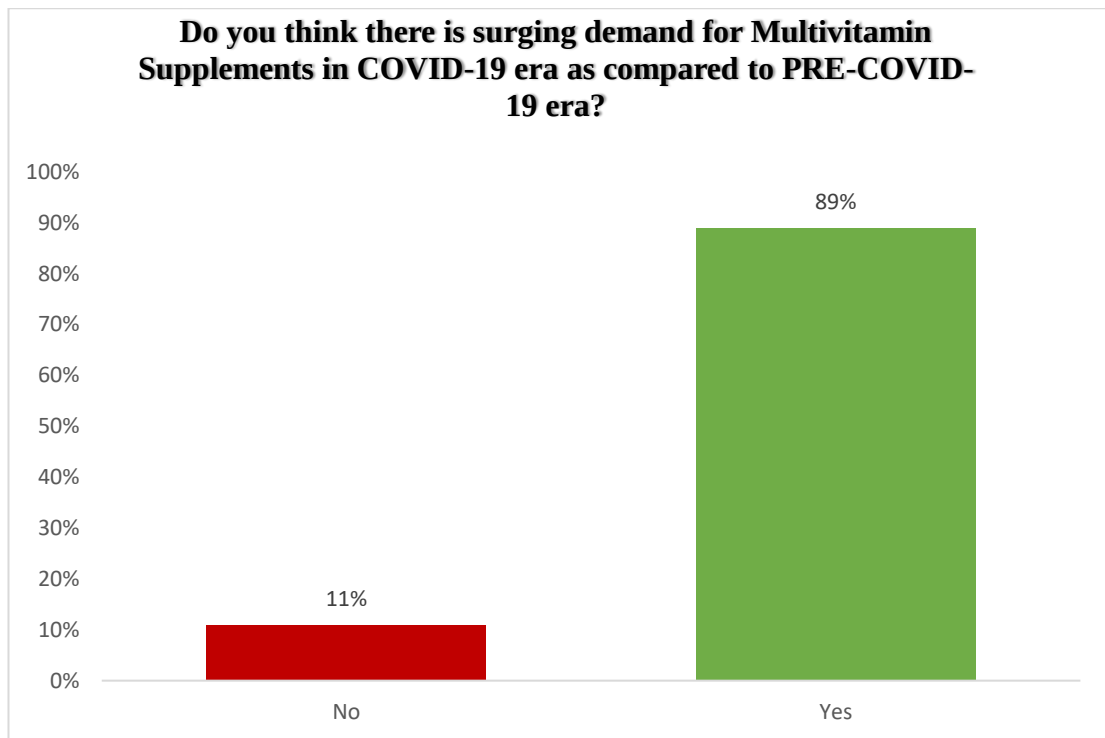
In the below Graph, it is depicting that,

- **Maximum Respondents (54%)** take Multivitamin Supplements as advised by doctors.
- **38% Respondents** practice Self-medication with respect to Multivitamin Supplements.
- **6% Respondents** follows Word of Mouth for Multivitamin Supplements.
- **2% Respondents** gets influenced by the Advertisements as far as Multivitamin Supplements is concern.
- Still good number of people practice Self-Medication as far as Multivitamin Supplements is concern, which is very harmful, if taken beyond the recommended dose.



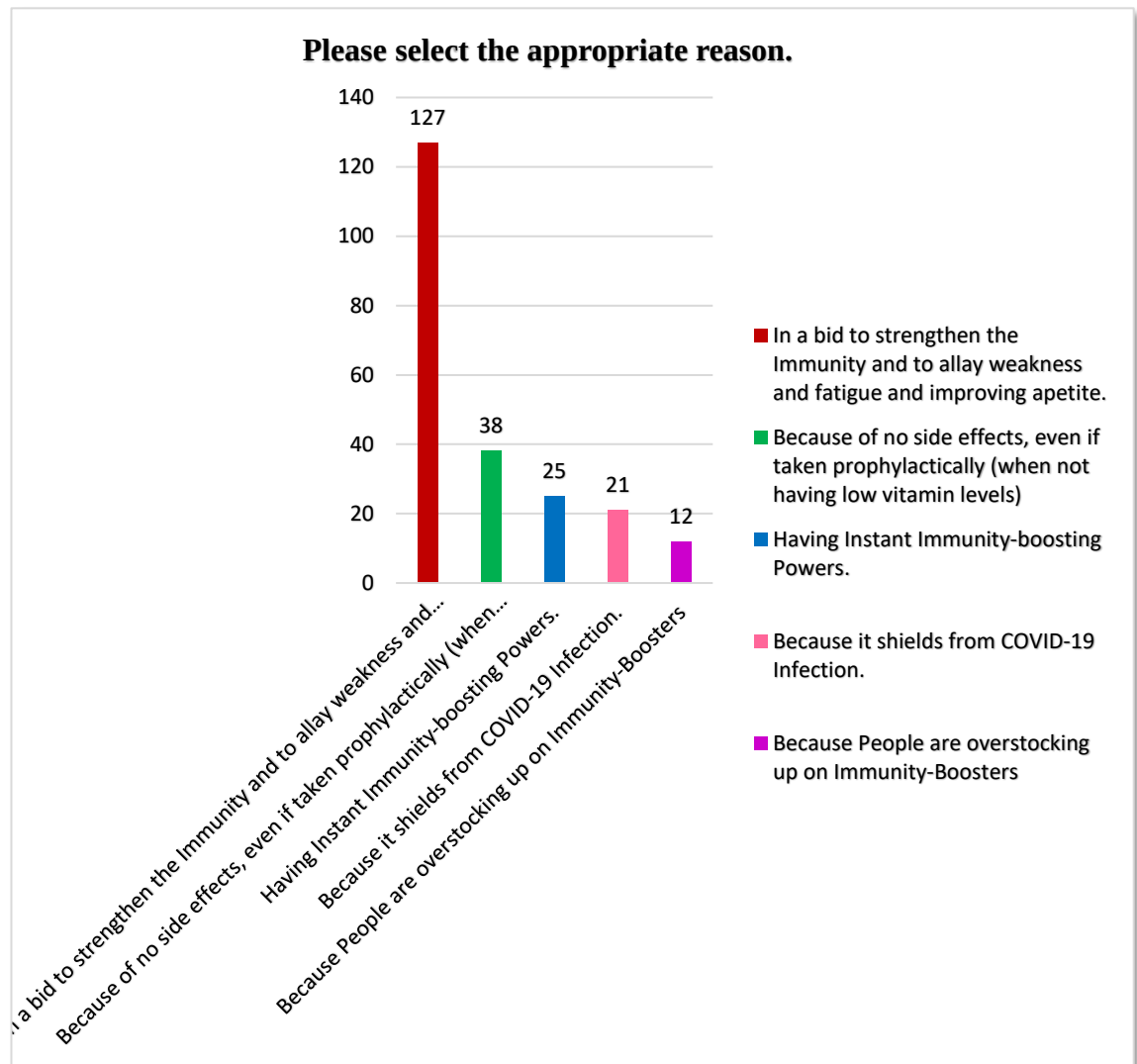
In the below Graph, it is depicting that,

- **Maximum Respondents (89%)** think that there is surging demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.
- **Minimum Respondents (11%)** think that there is no surging demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.



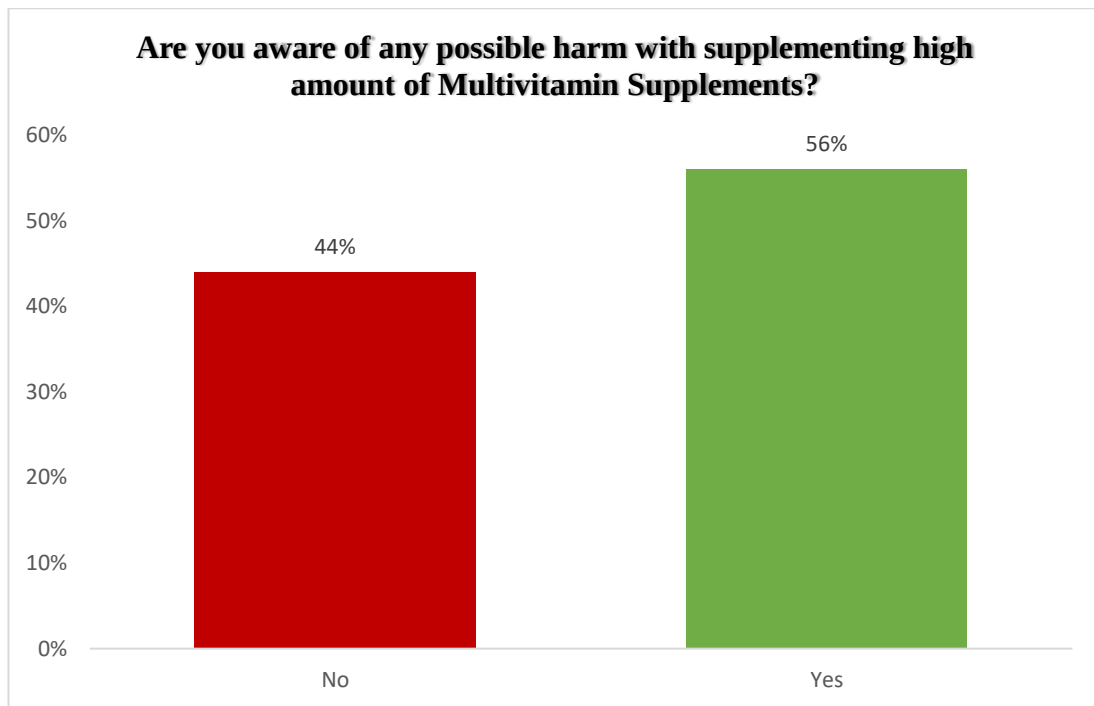
In the below Graph, it is depicting that,

- **Maximum Respondents (57%)** thinks that In a bid to strengthen the Immunity and to allay weakness and fatigue and improving appetite, there is surge in demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.
- **17% Respondents** thinks that Because of no side effects, even if taken prophylactically (when not having low vitamin levels) to be the reason for surge in demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.
- **11% Respondents** thinks that Because it shields from COVID-19 Infection to be the reason for surge in demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.
- **10% Respondents** thinks that Because People are overstocking up on Immunity-Boosters to be the reason for surge in demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.
- **5% Respondents** thinks that Having Instant Immunity-boosting Powers Infection to be the reason for surge in demand for Multivitamin Supplements in COVID-19 era as compared to PRE-COVID-19 era.



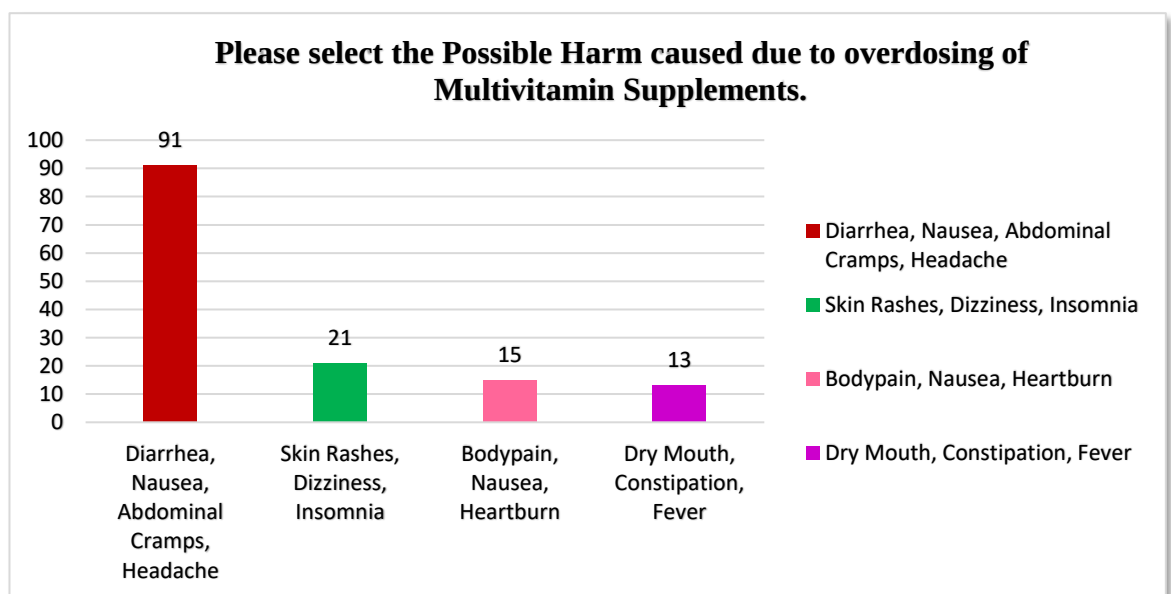
The below Graph depicts that,

- **Maximum Respondents 56%** are aware of possible harm with supplementing high amount of Multivitamin Supplements.
- But **still large number of Respondents 44%** are not aware of any possible harm with supplementing high amount of Multivitamin Supplements. Lack of Knowledge regarding Multivitamins exists, that's why Maximum Respondents taken in our Sample Size, despite not being COVID Positive, took Multivitamin Supplementation.



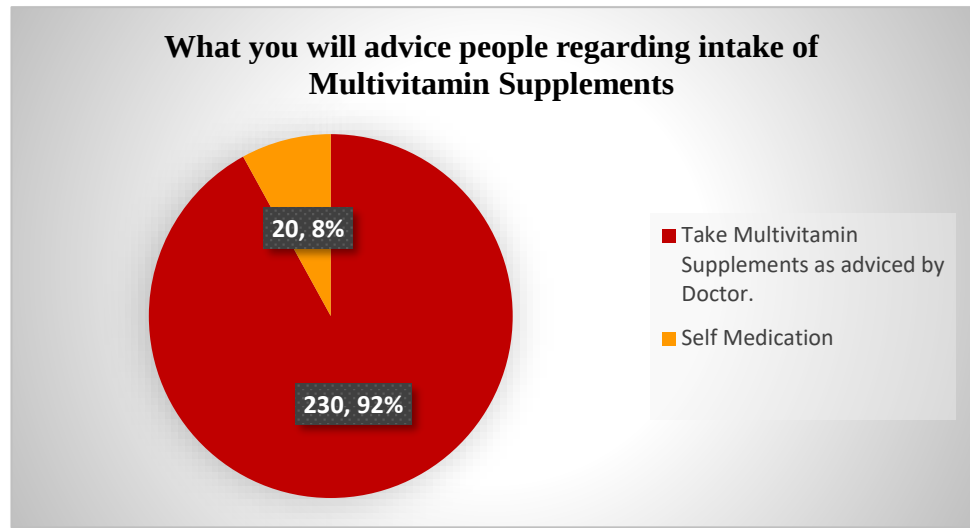
The below Graph depicts that,

- **Maximum Respondents (65%)** are aware of possible harm with supplementing high amount of Multivitamin Supplements.
- Still **35% Respondents** are unaware about the harmful consequences, which can occur due to supplementing high amount of Multivitamin Supplements.



The below Pie Chart depicts that,

- **Maximum Respondent 92%** are agreeing with the intake of multivitamin supplements as prescribed by doctor because it is harmful to take medicines, be it of multivitamins, without prescriptions.
- **Minimum Respondents 8% told** to take multivitamins as Self-Medication.



DISCUSSION –

- **Maximum respondents (75%)** have not been affected with COVID-19 Yet, but maximum (62%) respondents administered multivitamin supplements to boost up the Immunity levels.
- **35% respondents**, still a huge number has vitamin pills (Allopathic Source) as a first preference and **46% respondents** prefer taking combination of vitamin, minerals, and trace elements.
- According to the data collected and analysed, **54% Respondents** prefer Tablet dosage form for multivitamin consumption, and **24% respondents** don't have any fare idea of how to take Multivitamin Supplements, and what possible harm it can cause, taking Multivitamin Supplements either with milk, dairy products or with calcium supplements.
- **46% respondents** take Multivitamin Supplements either practising Self-Medication, or following Word of Mouth, or get influenced by the Advertisements and it is really very harmful, if taken beyond the standard recommended dose.
- **89% respondents** think that there is surging demand for Multivitamin Supplements in Covid era as compared to Pre-Covid era, and **57% respondents** chose, in a bid to strengthen the immunity and to allay weakness and fatigue and improving appetite as a reason for surge in demand for multivitamin supplements in Covid era as compared to Pre-Covid era. This actually happened because, this outbreak has brought Multivitamins into the limelight to boost up the immunity levels, that's why people started consuming it to a large extent and started having a myth that it will protect them from being Corona Positive.
- **Still a huge percentage of respondents (44%)** are not aware of any possible harm with supplementing high amount of Multivitamin Supplements. Lack of Knowledge regarding Multivitamins exists, that's why Maximum Respondents taken in our Sample Size, despite not being COVID Positive, took Multivitamin Supplementation.

CONCLUSION -

This study has analysed the Knowledge attitude and practise towards Multivitamin Supplements among General Population of India. As per the data collected, people are consuming Multivitamin Supplements, without consulting Doctor, practising Self-Medication, following Word of Mouth, getting influenced by the advertisements and then consuming, keeping a thought in a mind that, consuming multivitamin even if not detected with vitamin deficiency will boost immunity levels. and that too without consulting a doctor and taking maximum dose. This will actually result in complications. One should not consume Multivitamins without the advisory of the doctor. Without knowing the proper dose frequency, and up to how many days it should be continued taking, it can be dangerous to administered as it can harm the vital organs of the body. Maximum Respondents are not affected with COVID-19, still maximum respondents have consumed Multivitamin Supplements. Still number of respondents have Lack of knowledge regarding possible harm caused due to supplementing high dose of multivitamin, They are not even aware of interaction occurs when administered Multivitamin with either Milk, or calcium supplements, or any of the dairy products. If taken, so these all contain calcium which will make harder for the body to absorb certain ingredients of the multivitamins.

Limitation:

- Generalizability is poor due to less sample size taken because of unavailability of the respondents, may be because of the Pandemic Situation.
- Interpretation of the data collected had to be done among, above 250 Respondents or more than 250 respondents had to be taken to study effectively.
- Participants with psychological illnesses, participants who are not willing to participate in this study are excluded.
- Random Sampling had to be done properly and equal number of respondents had to be taken including different age groups.
- Respondents between 13-19 years of age had to be excluded from this study.
- The topic had to be studied more on depth and questionnaires had to be framed accordingly and sequentially.

Recommendation:

- One should take proper, wholesome foods and not depend on Multivitamin Supplements as multivitamins are required in a small amount to work efficiently.
- Multivitamin Supplements should be taken as per the advisory of the doctor.
- One should not prefer taking Multivitamin Supplements unless and until one is having symptoms of vitamin deficiency. And if having symptoms of vitamin deficiency, one must consult it with doctor to avoid causing harm to vital organs of the body.
- One must take Multivitamin Supplements according to the prescribed and recommended dose.
- One must consume Multivitamin Supplements with glass full of water and should be aware of the interaction which will cause, when taken these supplements either with Milk, or calcium supplements, or any of the dairy products.

REFERENCES –

1. Li, H., Liu, S., Yu, X., Tang, S., & Tang, C. (2020). Coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study. *International Journal of Antimicrobial Agents*, 55(5), 105951.
2. Hamulka, J., Jeruszka-bielak, M., Zielinska-pukos, M. A., Magdalena, G., & Drywie, M. E. (2021). Dietary Supplements during COVID-19 Outbreak. Results of Online Studies. *Nutrients*, 13, 54.
3. Zhang, F. F., Barr, S. I., McNulty, H., Li, D., & Blumberg, J. B. (2020). Health effects of vitamin and mineral supplements. *The BMJ*, 369. <https://doi.org/10.1136/bmj.m2511>
4. Chandra, R. K. (2002). Nutrition and the immune system from birth to old age. *European Journal of Clinical Nutrition*, 56, S73–S76. <https://doi.org/10.1038/sj.ejcn.1601492>
5. Ramanathan, K., Antognini, D., Combes, A., Paden, M., Zakhary, B., Ogino, M., Maclaren, G., & Brodie, D. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*, 395(January), 497–506.
6. Name, J. J., Souza, A. C. R., Vasconcelos, A. R., Prado, P. S., & Pereira, C. P. M. (2020). Zinc, Vitamin D and Vitamin C: Perspectives for COVID-19 With a Focus on Physical Tissue Barrier Integrity. *Frontiers in Nutrition*, 7(December), 1–14. <https://doi.org/10.3389/fnut.2020.606398>
7. Sahebnasagh, A., Saghafi, F., Avan, R., & Khoshi, A. (2020). *Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website. Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active. The prophylaxis and treatment potential of supplements for COVID-19. January.*

8. Wang, D., Hu, B., Hu, C., Zhu, F., Liu, X., Zhang, J., Wang, B., Xiang, H., Cheng, Z., Xiong, Y., Zhao, Y., Li, Y., Wang, X., & Peng, Z. (2020). Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA - Journal of the American Medical Association*, 323(11), 1061–1069. <https://doi.org/10.1001/jama.2020.1585>
9. Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19. The COVID-19 resource centre is hosted on Elsevier Connect, the company' s public news and information website. Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active. Erratum to “A review of the 2019 Novel Coronavirus (COVID-19) based on current evidence” [*International Journal of Antimicrobial Agents*. (2020). January.
10. Kashiouris, M. G., L'heureux, M., Cable, C. A., Fisher, B. J., Leichtle, S. W., & Fowler, A. A. (2020). The emerging role of vitamin C as a treatment for sepsis. *Nutrients*, 12(2), 1–16. <https://doi.org/10.3390/nu12020292>
11. Rossetti et al. (2020). High dose of ascorbic acid used in Sars Covid-19 treatment: Scientific and clinical support for its therapeutic implementation. *Ars Pharmaceutica*, 61(2), 145–148. <https://revistaseug.ugr.es/index.php/ars/article/view/15164/13105%0Ahttp://ovid.sp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emexb&NEWS=N&AN=2007229503>
12. Zhang, L., & Liu, Y. (2020). Potential interventions for novel coronavirus in China: A systematic review. *Journal of Medical Virology*, 92(5), 479–490. <https://doi.org/10.1002/jmv.25707>
13. Honardoost, M., Ghavideldarestani, M., & Khamseh, M. E. (2020). Role of vitamin D in pathogenesis and severity of COVID-19 infection. *Archives of Physiology and Biochemistry*, 14(2), 462–465. <https://doi.org/10.1080/13813455.2020.1792505>

14. Panarese, A., & Shahini, E. (2020). Letter: Covid-19, and vitamin D. *Alimentary Pharmacology and Therapeutics*, 51(10), 993–995.
<https://doi.org/10.1111/apt.15752>
15. Tian, Y., & Rong, L. (2020). Letter: Covid-19, and vitamin D. Authors' reply. *Alimentary Pharmacology and Therapeutics*, 51(10), 995–996.
<https://doi.org/10.1111/apt.15764>
16. Fabbri, A., Infante, M., & Ricordi, C. (2020). Editorial - Vitamin D status: a key modulator of innate immunity and natural defense from acute viral respiratory infections. *European Review for Medical and Pharmacological Sciences*, 24(7), 4048–4052. https://doi.org/10.26355/eurev_202004_20876
17. Anderson, G., & Reiter, R. J. (2020). Melatonin: Roles in influenza, Covid-19, and other viral infections. *Reviews in Medical Virology*, 30(3), 1–10.
<https://doi.org/10.1002/rmv.2109>
18. Reiter, R. J., Sharma, R., Ma, Q., Rosales-Corral, S., Acuna-Castroviejo, D., & Escames, G. (2019). Inhibition of mitochondrial pyruvate dehydrogenase kinase: a proposed mechanism by which melatonin causes cancer cells to overcome cytosolic glycolysis, reduce tumor biomass and reverse insensitivity to chemotherapy. *Melatonin Research*, 2(3), 105–119.
<https://doi.org/10.32794/mr11250033>
19. Hoffmann, P. R., & Berry, M. J. (2008). The influence of selenium on immune responses. *Molecular Nutrition and Food Research*, 52(11), 1273–1280.
<https://doi.org/10.1002/mnfr.200700330>
20. Hoffmann, P. R., & Berry, M. J. (2008). The influence of selenium on immune responses. *Molecular Nutrition and Food Research*, 52(11), 1273–1280.
<https://doi.org/10.1002/mnfr.200700330>
21. Hiffler, L., & Rakotoambinina, B. (2020). Selenium and RNA Virus Interactions: Potential Implications for SARS-CoV-2 Infection (COVID-19). *Frontiers in Nutrition*, 7(September), 1–10.
<https://doi.org/10.3389/fnut.2020.00164>
22. Escobedo Monge, M. F., Barrado, E., Vicente, C. A., Redondo Del Río, M. P., & Marugán de Miguelsanz, J. M. (2019). Zinc nutritional status in patients with cystic fibrosis. *Nutrients*, 11(1), 1–19. <https://doi.org/10.3390/nu11010150>

23. Wessels, I., Maywald, M., & Rink, L. (2017). Zinc as a gatekeeper of immune function. *Nutrients*, 9(12), 9–12. <https://doi.org/10.3390/nu9121286>

Annexure -

Q1) Do you agree with the consent and wish to participate?

- Yes
- No

Q2) Age

- 0-12
- 13-19
- 20-34
- 35-64
- 65+

Q3) Gender

- Male
- female
- Others

Q4) Have you been affected with COVID-19 Yet?

- Yes
- No

Q5) Do you have any Comorbidities?

- Yes
- No

Q6) Have you taken Multivitamin Products to Boost up the Immune System?

- Yes
- No

Q7) What is your First Preference source for Multivitamins Supplements?

- Home Remedies
- Vitamin Pills (Allopathic Source)

- Ayurvedic Source

Q8) Which vitamin do you prefer taking?

- Plain Vitamin – B Complex
- Vitamin – C
- Vitamin – D
- Vitamin – E
- Vitamins + Minerals + Trace elements

Q9) Which Dosage Form you prefer taking Multivitamin Supplements?

- Tablet Form
- Capsule Form
- Injectable Form
- Liquids
- Lozenges
- Powder Form

Q10) How you prefer taking Multivitamin Supplements?

- With Milk
- With Other Dairy Products
- With Full Glass of Water
- With any Calcium Supplements

Q11) What is your Call regarding intake of Multivitamin Supplements?

- Self-Medication
- Advice of Doctor
- Word of Mouth
- Advertisement

Q12) Do you think there is surging demand for Multivitamin Supplements in COVID-19 era as compared to PRE – COVID-19 era? (If yes, then next question will appear)

- Yes
- No

Q13) Please select the appropriate reason.

- In a bid to strengthen the immunity and to allay weakness and fatigue and improving appetite.
- Because of no side effects, even if taken prophylactically (when not having low vitamin levels)
- Because it shields from COVID-19 Infection.
- Because People are overstocking up on Immunity-Boosters
- Having Instant Immunity-boosting Powers.

Q14) Are you aware of any Possible harm with Supplementing high amount of Multivitamin Supplements? (If yes, next question will appear)

- Yes
- No

Q15) Please select the Possible Harm caused due to overdosing of Multivitamin Supplements.

- Diarrhoea, Nausea, Abdominal Cramps, Headache.
- Body pain, Nausea, Heartburn
- Skin Rashes, Dizziness, Insomnia
- Dry Mouth, Constipation, Fever

Q16) What you will advise people regarding intake of Multivitamin Supplements?

- Take Multivitamin Supplements as advised by doctor.
- Self-Medication