# COVID 19: A STUDY ON THE KAP OF TRADITIONAL IMMUNE BOOSTING FOODS AND PERSONAL HYGIENE AFTER FIRST WAVE AMONG ADULTS IN TAMILNADU, INDIA.

**1. M. Krithik, 2. K Karthick 3. Ms. J. Vinodha Evangeline**

**1.** UG Scholar **2.** UG Scholar **3.** Assistant Professor, Nutrition Department

**1,2,3 :** SRM Institute of Hotel Management

SRM Institute of Science and Technology, Kattankulathur

**ABSTRACT:** A highly pestilent Severe Acute Respiratory Syndrome cov-2 virus brings about respiratory infections spread globally all around the world from Wuhan city, china at the end of December 2019. This pandemic became a threat to human era due to its high mortality rate and rapid transmission from human to human. **Background:** Global COVID-19 outbreak made a significant impact among people to improve their immune system in order to protect themselves from infection, by adapting different practices such as inculculating exercise habits, infusing nutritious foods and instilling the intake of regional herbs and spices. **Objectives:** The objective of the study was to assess the knowledge, awareness and practice of immune boosting foods among adults after first wave of SARS Cov-2 hits India. **Methodology:** A voluntary online survey was conducted among people on different age categories in Tamil Nadu, India. A questionnaire was structured and mailed to the participants. **Results:** A total of 200 responses have been recorded, in which sixty-eight percent of respondents were male and thirty-two percent of the respondents were female. Majority (Seventy-one percent) of the respondents are young adults between the age group 20 to 30. Sixty-eight percent of people have accepted the fact that consumption of fermented foods in the diet can improve the immune system. Since hand is the vehicle for the transmission of virus, ninety-two percent of the people are aware that washing hands with soap and running water or sanitizer (alcohol base) will kill the virus. **Conclusion:** The inconceivable fact that India is the leading and largest producer of many varieties of fruits and vegetables still, consumption of fruits and vegetables is very less among people of India. Value of fruits and vegetables consumption has been re-recognized during the times of COVID 19, which helps in combating the virus.

**Key words:** Immune boosting foods, Covid 19, First wave, KAP, Personal Hygiene

## INTRODUCTION:

With over 2,589,682 confirmed cases and 49,980 deaths reported to date (16th August, 2020) in India. (1) COVID-19pandemic become a human threat and created a potential impact on citizens of all nations. Immune system plays a vital role by creating a barrier that resists the foreign particles (virus, germs and bacteria) from

entering into the body. If the immune system fails to clear away the foreign particles, its starts to spread, this may lead to fatal damage. At present there is no clinically approved vaccination against covid-19. The only way to avoid being exposed to virus is by increasing the immune system. Research shows that, covid-19 affects immune cells.

Corona viruses belongs to coronaviridae family, the structure of coronavirus consists crown like spikes on the outer surfaces of virus and the corona viruses are minute in size (65-125nm) in diameter and contains a single-stranded RNA as a nuclear material, size ranging from 26 to 32 kbs in length. (2) the SARS-CoV-2 belongs to the subgenus Sarbecovirus and considered to be a new beta coronavirus. (3) Coronavirus belongs to sub family Coronavirinae in the family of Coronaviridae and the subfamily consist of four genera: ALPHACORONAVIRUS, BETACORONAVIRUS, GAMMACORONAVIRUS, AND DELTACORONAVIRUS (4) The coronavirus encodes four kinds of structural protein namely: Spike (S), Membrane (M), Envelope (E), and Nucleocapsid (N). (5)The transmission of COVID-19 is suspected to originate from an animal host i.e. zoonotic origin followed by human-to-human transmission. (6) The COVID-19 infected person are experiencing various symptoms ranging from common symptoms such as fever, headache, dry cough, tiredness and serious symptoms include breathlessness, chest pain and speech impairment. (7) A recent study shows that 97.5 percent of people infected with COVID-19 are exhibiting symptoms by 11.5 days. (8) According to WHO, the average incubation period of COVID-19 is up to 5-6 days and maximum of 14 days. (9)

Research shows that stress hormones may suppress the immune system and also, affects growth and development.(10) Especially the students pursuing higher education, aged between 20-30 are facing a lot of psychological barriers like stress, anxiety, fear and loneliness. (11)

**METHODOLOGY:**

A voluntary online survey was conducted among people from Early, Middle and Late adulthood. A questionnaire was structured and mailed to the participants, focused on various aspects of awareness, hygienic practices, and knowledge of immunity against covid-19 outbreak. A total of 200 responses were received from people living in different districts of Tamil Nadu, India. The collected data was coded and analyzed percentage in MS office.

**STUDY PERIOD:** This study was conducted in the period of July 2020 to August 2020 after the spread of SARS Cov2 First Wave.

**OBJECTIVE OF THE STUDY:** The main objective of the study was to assess the knowledge, awareness and practice level of immune boosting foods after the spread of SARS Cov2 first wave outbreak.

**Results and discussion:**

**Table: 1 Percentage distribution of people opinion about covid-19 and its risk**

| Opinion about Disease | Number | Percentage |
|---|---|---|
| Communicable | 193 | 97 |
| Non-Communicable | 7 | 3 |

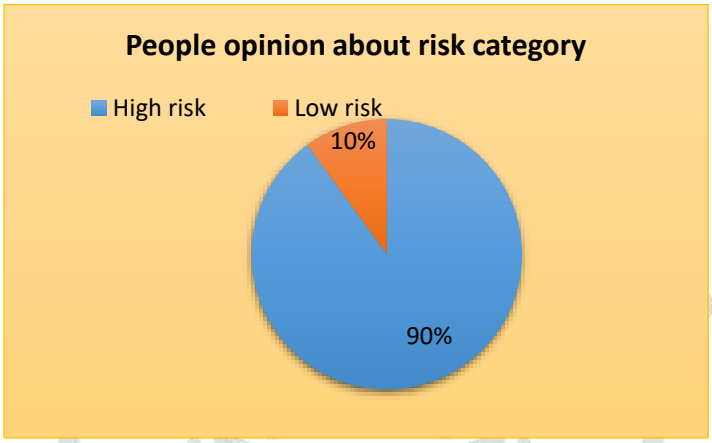


**Figure 1: Percentage Distribution of people opinion about covid-19 and its risk**

**Results:** From the Figure 1, it has been inferred that, ninety-seven percent of people are aware of SARS Cov 2 will transmit from one person to other person. A new research reveals that Covid-19 is a rapidly spreading communicable disease all over the world. (12) People with pre-existing diseases such as diabetes, Hypertension, cardiovascular diseases and respiratory issues like wheezing, asthma are possess a high risk of Covid-19 complications. A study which includes 46,248 patients with clinically confirmed Covid-19 is having higher probability of oppressive diseases like cardiovascular diseases, Respiratory diseases and Hypertension. (13) In the other study smoking and obesity where correlating with high risk of covid-19 (14, 15)

**Table: 2 Percentage distribution of fermented foods increase immunity.**

| Fermented foods increase immunity | Number | Percentage |
|---|---|---|
| Yes | 135 | 68 |
| No | 65 | 32 |

**Results:** From the table 2, it has been observed that sixty-eight percent of people have accepted the fact that consumption of fermented foods in the diet can improve the immune system. In Tamil Nadu most of the foods are fermented like idly, dosa and the authentic food called fermented rice (pazhya sadham). (16) The gut bacteria play a vital role in maintaining physical and mental health. The gut health of a person who includes fermented foods in their daily diet tends to have a distinct species of bacteria in their gut (17) fermented foods

contain unique properties such as anti-oxidant, anti-microbial, anti-fungal, anti-inflammatory, anti-diabetic and anti-atherosclerotic activity. (18)

**Table:3 Percentage distribution of Zinc and vitamin C foods are rich in boosting immune health in human body.**

| Zinc and Vitamin C foods | Number | Percentage |
|---|---|---|
| Yes | 181 | 91% |
| No | 19 | 9% |

**Results:** From the table:3, it has been observed that ninety-one percent of the people accepted the statement that, Zinc and Vitamin C plays a vital role in boosting Immune health and only nine percent of the people denied the statement. India is privileged with all the natural resources and hence it is also one of the leading producers in many of the natural products. The inconceivable fact that India is the leading and largest producer of many varieties of fruits and vegetables still, consumption of fruits and vegetables is very less among people of India. Value of fruits and vegetables consumption has been re-recognized during the times of COVID 19, which helps in combating the virus.

Zinc is essential for optimal immune function and deficiency in zinc may leads to high risk of bacterial infections. (19) Study reveals that human body requires zinc to develop and stimulate T-lymphocytes. (20) Vitamin C is an essential vitamin with pleiotropic functions, starting from antioxidant to antiviral function and it is also known as L-ascorbic acid.(21) vitamin-c is found to be effective against covid-19 related medical conditions like cardiovascular diseases, cancer, hypertension, diabetes, and microbial infections. (22, 23, 24,25,26). A research conducted in 2012, reveals that vitamin-c protects lung cells by fighting against oxidative damage. (27)

**Table:4 Percentage distribution of Ginger is anti-inflammatory (Reduces pain and swelling) and turmeric is anti-bacterial (fights against bacteria), which helps us to resist virus transmission in our body.**

| Statement | Number | Percentage |
|---|---|---|
| Agree | 170 | 70 |
| Disagree | 30 | 30 |

**RESULTS:** From table-4, it has been observed that, seventy percent of the respondents have accepted the statement that ginger has anti-inflammatory and turmeric has anti-bacterial effect which helps to resist virus transmission in our body.

Turmeric is a rhizomatous herbaceous perennial plant (Curcuma longa) belongs to ginger family. (28) Turmeric is one of the traditional medicines used as herb due to its antioxidant, anti-inflammatory, antimutagenic, antimicrobial, antibacterial and anticancer properties. (29) One of the important ingredients found in curcumalonga are Curcumin, dihydrocurcumin, and hexahydrocurcumin. Curcumin is extremely effective in acute respiratory distress syndrome, COPD's, acute lung injury and pulmonary fibrosis. (30) Ginger belongs to the genus Zingiber belongs to the family Zingiberaceae. (31) The ginger contains two biologically active constituents which include gingerols and shogaols. (32) 6-Gingerol contains various pharmacological and physiological effects including anti-inflammatory, analgesic, antipyretic, gastroprotective, cardiotonic, and antihepatotoxic activities (33,34) Ginger has been used for treatment of numerous diseases, such as colds, nausea, arthritis, migraines, hypertension, indigestion, flu, pain, cancer, heart diseases and overall sickness of the body. (35)

**Table: 5 Percentage distributions of exercise / yoga help to improve immunity in the body**

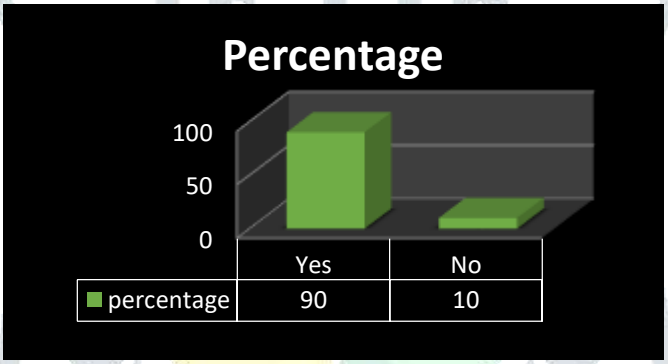


**Figure 2: Percentage distribution of Physical activity in improving immunity**

**RESULTS:** Figure 2 shows that, ninety percent of the people have the knowledge of exercising and yoga helps to boost immunity in our body. Physical activity is pivotal for a healthy lifestyle. Being active and exercising perpetuate physiological, psychological and social health of the individual.

According to a new research conducted by Zhen Yana reveals that, exercise will prevent and "strongly support" or at least reduce the severity of acute respiratory distress syndrome, a primary cause of death in patients affected by covid-19. (36) Yoga and breathing exercises helps to increase the blood oxygen level in our body. According to a study conducted on 50 patients with hypertension and low PEFR, SpO2. Shows that, Peak Expiratory Flow Rate (PEFR) from less than 400 liters per minute (l/min) to 640 l/ min and also the spo2 (oxygen saturation) levels reached 95 percent among 80-90% in 41of the participants at the start of the study. (37) A new research shows that, adults are spending their time by doing workouts, breathing exercises, and yoga during this lockdown period. (14)

**Table: 6 Percentage distribution of wearing mask will reduce the transmission of virus.**

| Options | Number | Percentage |
|---|---|---|
| Yes | 180 | 90 |
| No | 20 | 10 |

**RESULTS:** From table-6, it has been inferred that, ninety percent of the people accepted the fact that wearing mask will reduce the viral transmission. Mask acts as a barrier between nose and mouth of the wearer and environment by reducing the risk of viral transmission. The virus mostly spread through micro droplets from infected person to healthy one by coughing and sneezing. Standard facial masks are considered to be effective in blocking splashes, and large particle droplets (38). Hence, it is essential to wear mask over the nose and mouth in order to reduce the transmission of virus from one person to another.

**Table: 7 Percentage distribution of washing hands with soap and running water or rubbing sanitizer (alcohol base) will kill the virus.**

| Options | Number | Percentage |
|---|---|---|
| Yes | 184 | 92 |
| No | 16 | 8 |

**RESULTS:** From table-7, it has been inferred that, ninety-two percent of the people are having the knowledge of washing hands with soap and running water or rubbing sanitizer (alcohol base) will kill the virus since hand is the vehicle for the transmission of virus. Hand hygiene is one of the simple and easiest ways of killing the pathogenic virus from the hands. According to centers for disease control, washing hands with soap and water of at least twenty seconds is the first line of defense in reducing the transmission of virus. (39) A research conducted on 2015 reveals that, people touched their face 23 times per hour. (40) The hands are probably the most significant route of transmission, because the virus may transfer via hands by touching the contaminated surface and touching the eyes, nose and mouth. (41)

**Table: 8 Percentage distribution of respondents consumed kabasura kudineer and if yes for what reason.**

| Options | Number | Percentage |
|---|---|---|
| Yes | 150 | 75 |
| No | 50 | 25 |
| **If yes, Reason** | **Number** | **Percentage** |
| To boost immunity | 67 | 40 |
| As a precaution | 36 | 20 |
| To prevent the spike protein of the virus ,to bind with host cell receptor | 65 | 40 |

**RESULTS:** From table 8 it has been observed that, seventy-five percent of the people have the practice of consuming kabasura kudineer in which, Consumption of the forty percent people for boosting immunity, twenty percent are consuming it as a precautionary measure and remaining forty percent of the people believe that it can prevent the spike protein of the virus, to bind with host cell receptor. Siddha system of medicine is one of the ancient medicines originated from Tamil nadu, south India. Kabasura kudineer is one of the polyherbal siddha formulation which is prepared by boiling 15 ingredients, recommended for common respiratory ailments such as cough, cold, breathing difficulty and flu. (42) The shelf life of the decoction is only for three hours. (43) The preparation was reported to maintain anti-inflammatory, antipyretic, antibacterial property in our body. The scientific research on kabasura kudineer reveals that it has promising activity against viral spike glycoprotein of covid-19 and also phyto compounds present in kabasura kudineer, prevents the spike protein bind with host cell receptor. The government of India has recommended kabasura kudineer to fight against viral infection of covid-19. (44)

**Acknowledgement:**

I would like to express sincere gratitude to Mr. Suresh and Mr. Manikandan for helping me in conducting this study successfully in this gruelling situation.

**REFERENCE:**

1. WWW. WHO. ORG
2. Shereen, M. A., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research*
3. Zhu N, Zhang D, and et.al., (2020) A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med 10.1056/NEJMoa2001017
4. Chen Y, Liu Q, Guo D. 2020. Emerging coronaviruses: genome structure, replication, and pathogenesis J Med Virol 10.1002/jmv.25681.
5. WWW. WHO. ORG Coronavirus disease 2019 (COVID-19) Situation Report – 66
6. Rodriguez-Morales AJ, and et., al. 2020. History is repeating itself: Probable zoonotic spillover as the cause of the 2019 novel Coronavirus Epidemic. Infez Med 28
7. Murugeswari, M., & Rajeswari, S. P. (2020). A study on awareness, attitudes and prevention of covid-19 in selected rural areas with special reference to tirunelveli district. *CLIO Annu Interdiscip J Hist*, *6*(4), 425-437.
8. Shaikh, S. S., Jose, A. P., Nerkar, D. A., Kv, M. V., & Shaikh, S. K. (2020). COVID-19 pandemic crisis—a complete outline of SARS-CoV-2. *Future Journal of Pharmaceutical Sciences*, *6*(1), 1-20.
9. www. medscape. Com, What is the incubation period for coronavirus disease 2019 (COVID-19)

10. Segerstrom, S. C., & Miller, G. E. (2004). Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. *Psychological bulletin*, *130*(4), 601.

11. Karthick, K., & Evangeline, V. (2020). COVID–19: Unprecendented necessity of e learning platform and emotional intelligence among students in higher education institution, tamilnadu. *International Research Journal of Management Sociology & Humanities*, *11*, 5.

12. Gupta, R., Ghosh, A., Singh, A. K., & Misra, A. (2020). Clinical considerations for patients with diabetes in times of COVID-19 epidemic. *Diabetes & metabolic syndrome*, *14*(3), 211.

13. Yang, J., Zheng, Y., Gou, X., Pu, K., Chen, Z., Guo, Q., ... & Zhou, Y. (2020). Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. *Int J Infect Dis*, *10*(10.1016).

14. Huang, R., Zhu, L., Xue, L., Liu, L., Yan, X., Wang, J., ... & Wu, C. (2020). Clinical findings of patients with coronavirus disease 2019 in Jiangsu province, China: A retrospective, multi-center study. *PLoS neglected tropical diseases*, *14*(5), e0008280..

15. Wang, D., Hu, B., Hu, C., Zhu, F., Liu, X., Zhang, J., ... & Peng, Z. (2020). Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *Jama*, *323*(11), 1061-1069.

16. Kumar, P. P., Begum, V. H., & Kumaravel, S. (2012). Mineral nutrients of pazhaya sadham: A traditional fermented food of Tamil Nadu, India. *International Journal of Nutrition and Metabolism*, *4*(11), 151-152.

17. www. readersdigest. In Fermented Foods For Boosting Immunity dated on April 12, 2020

18. Kumar, P. P., Begum, V. H., & Kumaravel, S. (2012). Mineral nutrients of pazhaya sadham: A traditional fermented food of Tamil Nadu, India. *International Journal of Nutrition and Metabolism*, *4*(11), 151-152.

19. Djoko, K. Y., Cheryl-lynn, Y. O., Walker, M. J., & McEwan, A. G. (2015). The role of copper and zinc toxicity in innate immune defense against bacterial pathogens. *Journal of Biological Chemistry*, *290*(31), 18954-18961.

20. Beck, F. W., Prasad, A. S., Kaplan, J., Fitzgerald, J. T., & Brewer, G. J. (1997). Changes in cytokine production and T cell subpopulations in experimentally induced zinc-deficient humans. *American Journal of Physiology-Endocrinology and Metabolism*, *272*(6), E1002-E1007.

21. Carr, A. C., Rosengrave, P. C., Bayer, S., Chambers, S., Mehrtens, J., & Shaw, G. M. (2017). Hypovitaminosis C and vitamin C deficiency in critically ill patients despite recommended enteral and parenteral intakes. *Critical care*, *21*(1), 1-10.
22. Carr, A. C., Rosengrave, P. C., Bayer, S., Chambers, S., Mehrtens, J., & Shaw, G. M. (2017). Hypovitaminosis C and vitamin C deficiency in critically ill patients despite recommended enteral and parenteral intakes. *Critical care*, *21*(1), 1-10**.**
23. Ngo, B., Van Riper, J. M., Cantley, L. C., & Yun, J. (2019). Targeting cancer vulnerabilities with high-dose vitamin C. *Nature Reviews Cancer*, *19*(5), 271-282.
24. Iqbal, K., Khan, A., & Khattak, M. M. A. K. (2004). Biological significance of ascorbic acid (vitamin C) in human health-a review. *Pakistan Journal of Nutrition*, *3*(1), 5-13**..**
25. Afkhami-Ardekani, M., & Shojaoddiny-Ardekani, A. (2007). Effect of vitamin C on blood glucose, serum lipids & serum insulin in type 2 diabetes patients. *Indian Journal of medical research*, *126*(5), 471.
26. Walingo, K. M. (2005). Role of vitamin C (ascorbic acid) on human health-a review. *African Journal of Food, Agriculture, Nutrition and Development*, *5*(1).
27. Sram, R. J., Binkova, B., & Rossner Jr, P. (2012). Vitamin C for DNA damage prevention. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis*, *733*(1-2), 39-49.
28. Priyadarsini, K. I. (2014). The chemistry of curcumin: from extraction to therapeutic agent. *Molecules*, *19*(12), 20091-20112**.**
29. De, L. C., & De, T. (2020). Protective foods to develop immunity of individuals against COVID 19. *Biotica Research Today*, *2*(5 Spl.), 287-290.
30. Lelli, D., Sahebkar, A., Johnston, T. P., & Pedone, C. (2017). Curcumin use in pulmonary diseases: State of the art and future perspectives. *Pharmacological research*, *115*, 133-148**.**
31. Holttum, R. E. (1950). The zingiberaceae of the Malay Peninsula. *Gard. Bull. Singapore*, *13*(1), 1-249.
32. Jiang, H., Xie, Z., Koo, H. J., McLaughlin, S. P., Timmermann, B. N., & Gang, D. R. (2006). Metabolic profiling and phylogenetic analysis of medicinal Zingiber species: Tools for authentication of ginger (Zingiber officinale Rosc.). *Phytochemistry*, *67*(15), 1673-1685.
33. Dedov, V. N., Tran, V. H., Duke, C. C., Connor, M., Christie, M. J., Mandadi, S., & Roufogalis, B. D. (2002). Gingerols: a novel class of vanilloid receptor (VR1) agonists. *British journal of pharmacology*, *137*(6), 793-798.
34. Jolad, S. D., Lantz, R. C., Solyom, A. M., Chen, G. J., Bates, R. B., & Timmermann, B. N. (2004). Fresh organically grown ginger (Zingiber officinale): composition and effects on LPS-induced PGE2 production. *Phytochemistry*, *65*(13), 1937-1954.

35. Yan, Z., & Spaulding, H. R. (2020). Extracellular superoxide dismutase, a molecular transducer of health benefits of exercise. *Redox biology*, *32*, 101508.

36. www. timesofindia. Com dated on Jun 21, 2020.
37. Repici, A., Maselli, R., Colombo, M., Gabbiadini, R., Spadaccini, M., Anderloni, A., ... & Lagioia, M. (2020). Coronavirus (COVID-19) outbreak: what the department of endoscopy should know. *Gastrointestinal endoscopy*, *92*(1), 192-197.2007
38. Siegel, J. D., Rhinehart, E., Jackson, M., & Chiarello, L. (2007). 2007 guideline for isolation precautions: preventing transmission of infectious agents in health care settings. *American journal of infection control*, *35*(10), S65-S164.
39. Engel, J., Head, G. C., O'Boyle, C., Pitt, H. M., & Director, E. (2007). 2007 guideline for isolation precautions: preventing transmission of infectious agents in health care settings. *Am J Infect Control*, *35*, S65-164.
40. Bloomfield, S. F., Aiello, A. E., Cookson, B., O'Boyle, C., & Larson, E. L. (2007). The effectiveness of hand hygiene procedures in reducing the risks of infections in home and community settings including handwashing and alcohol-based hand sanitizers. *American journal of infection control*, *35*(10), S27-S64.
41. Mekala, P., & Murthy, T. G. K. (2020). Phytochemical screening and pharmacological update on Kabasura Kudineer Choornam and Nilavembu Kudineer Choornam. *Journal of Pharmacognosy and Phytochemistry*, *9*(3), 1031-1036.
42. KS, M. M. (1988). Gunapadam Mooligai Vaguppu.
43. www. tamiluniversity. ac. in dated on 06 April, 2020
44. Sundaram, K. M., & Ramasamy, M. S. (2020). Coronavirus Spike (S) Glycoprotein (2019-Ncov) Targeted Siddha Medicines Kabasura Kudineer and Thonthasura Kudineer–In silico Evidence for Corona Viral Drug. *Asian Journal of Pharmaceutical Research and Health Care*, *12*(1), 20-27.