



CLINICAL PHARMACIST: THE KEY TO NEW SUCCESSES IN PREVENTION AND CONTROL OF COVID-19 CRISIS: A REVIEW.

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ABSTRACT:

As we all know the whole world is suffering from the pandemic first it was found as SARS COV-19 afterword it is termed as COVID-19 which is challenging for all of us. The paramedical staff is playing a better role in the prevention of COVID-19. The pharmacist is one of the people who is also fighting against COVID-19 to protect the world from worse its form. The role of the pharmacist in a pandemic is beneficial for awareness, counselling, and carry out the preventing measures through society.

Pharmacists can play a dynamic role by showing their abilities like drug information experts and stay updated about illness or disease condition. Patient counselling by the pharmacist for the society for the maintenance of sanitation and better hygiene of themselves will be very beneficial in disease prevention and control. As the pandemic gets progressed day by day the condition is become hard for defending against it show updated form as like recently found symptoms like tastelessness and loss of smell which was not found in any previous history and for confirmation it can be diagnosed by using swab testing, blood, sputum cultures. AYUSH MANTRALAYA is also showing activity by improving the immunity of humans by guidance about drugs which improve the health status within them proper utilization can be beneficial for improvement.

KEYWORDS: Covid-19, Pharmacist, Drug Information, Patient Counselling, Sanitation, Prevention.

1. INTRODUCTION:

- Pandemic occurs intermittently over centuries although the timing cannot be predicted. Internet Telework we can utilize to help slow down the spreading of disease by keeping face to face of various people to a minimum (referred to as social distancing) while maintaining operations as close to normal as possible,
- Pandemics can be controlled by maintaining follow conditions:
 1. Avoid close contact.
 2. Keep the distance.
 3. Cover the mouth and nose.
 4. Washing the hands frequently.
 5. Avoid touching the eyes, nose, or mouth.
 6. Practice good health habits.

Sign and symptoms:

1. Shortness of breath
2. Cough
3. Fever
4. Fatigue
5. Loss of smell.

Covid-19 is an infection that occurs due to the novel coronavirus which belongs to the *Coronaviridae* family.



Fig. no.1. Mode of transmission.

Diagnosis: Disease conditions diagnosed as similar to other conditions caused by viral infection using blood, saliva, tissue sample most test use a cotton swab to retrieve a sample from the inside nostrils^[1,2,4]

Treatment:

A variety of treatment is tested against COVID-19 but there is any proper recommended treatment is not available till now but researchers are doing the various test for possible treatments.

Non-pharmacological management:

- If the person gets infected physicians to instruct him to isolate himself by using a separate bathroom, bedroom, and clothes
- Infected person should have proper instruction of physician like wear N-95 mask, avoid touching anything, and maintain proper sanitation.
- First thing that person should have to manage his stressful or anxious condition take care of his health.

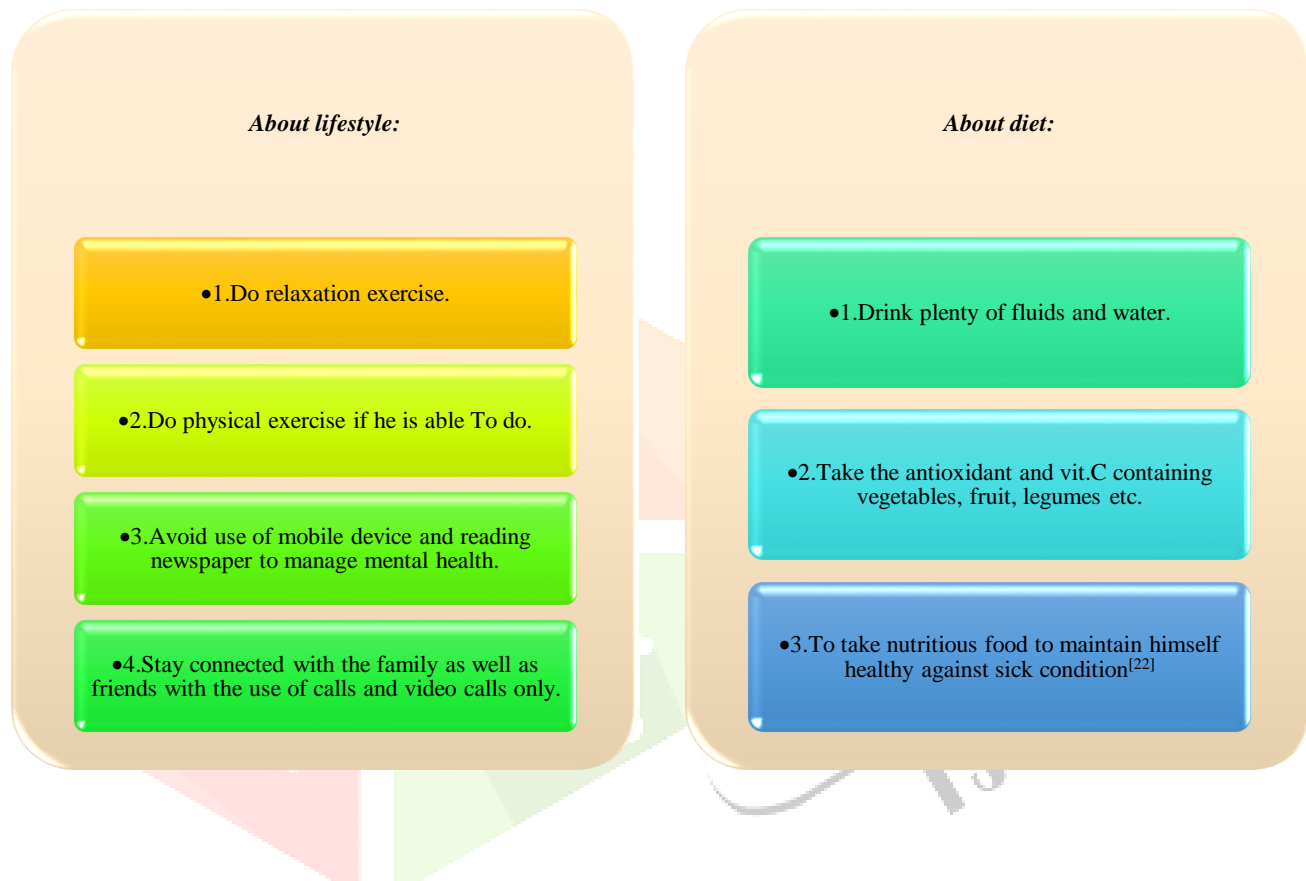


Fig. No. 2. Non-Pharmacological treatments.

Pharmacological management:***1. Investigational antiviral therapy:***

Remdesivir: It is a broad-spectrum antiviral drug (nucleotide analog). In May 2020, the US FDA has issued as Remdesivir can be allowed as an emergency use of a drug at severe COVID-19 infection.

MOA: Act by inhibition in the replication of COVID-19 Which infects pulmonary tissue.

ADR'S: Nausea, vomiting, rash.

Contraindication: hypersensitivity to the drug It is a broad spectrum antiviral drug (nucleotide analogue). In May 2020, US FDA have issued as Remdesivir can allowed as emergency use of drug at severe COVID-19 infection.

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2. Role of immunomodulators:

Immunomodulation will show benefits in the correction of infection due to most often condition like hyper inflammation, cytokine, interleukin release during infectious condition some drugs are utilized for the achievement of the suggested therapeutic targets.

Hydroxychloroquine and chloroquine: The main mechanism of the drug is antimalarial but has some specific role in the improvement of immunity in disease such as autoimmune disorder. Its Clinical trial for COVID-19 shows some benefits in the correction of infection.

ADR'S: Purple rash, swelling of face, burning eyes, skin pain.

Contraindication: hypo glycemia, Anemia, porphyria.

Interleukin inhibitor agents: In COVID-19 pathogenesis mainly the release of IL-6, IL-12, IL-1, IL-18, And TNF- ALFA occurs so the specific inhibition of the mediators results in lower inflammation as well as better O₂ and CO₂ exchange through lung cells.

MOA: Inhibits a certain type of chemical messenger or medication like IL and TNF- ALFA.

ADR'S: pyrexia, Diarrhoea.

Contraindication: Hepatotoxicity, pancreatitis.

3. Steroidal or non-steroidal Anti-inflammatory agents:

Anti- Inflammatory drugs do not have any significant role in the correction of COVID-19 Disease can be utilized for minimizing chances of worsening to precipitation of septic shock as well as toxin release control purpose.

MOA: These agents are acted by showing their mechanism inhibition of Inflammatory mediators (But non-specific in this type of condition used to prevent mortality of Disease condition).

ADR'S: Obesity, growth retardation in child, convulsions, depression, euphoria, insomnia.

Contraindication: Adenopathy, Hypertension.

4. In condition of Exacerbation:

Ifenprodil: (NMDA Antagonist) Shows its mechanism by NMDA inhibition in lung cells that results in lowering the cellular damage^[23]

5. If the person is suffering from symptoms :

Physicians can go for selection drug choice of that symptom Like,

Fever- Antipyretic agents. E.g. paracetamol, Acetaminophen.

Cough- Cough syrups having bronchodilators. E.g. salbutamol or Ambroxol.

Throat pain- Antihistaminic. E.g. cetirizine, levocetirizine.

2. LIFE CYCLE OF COVID-19 IN HUMAN:

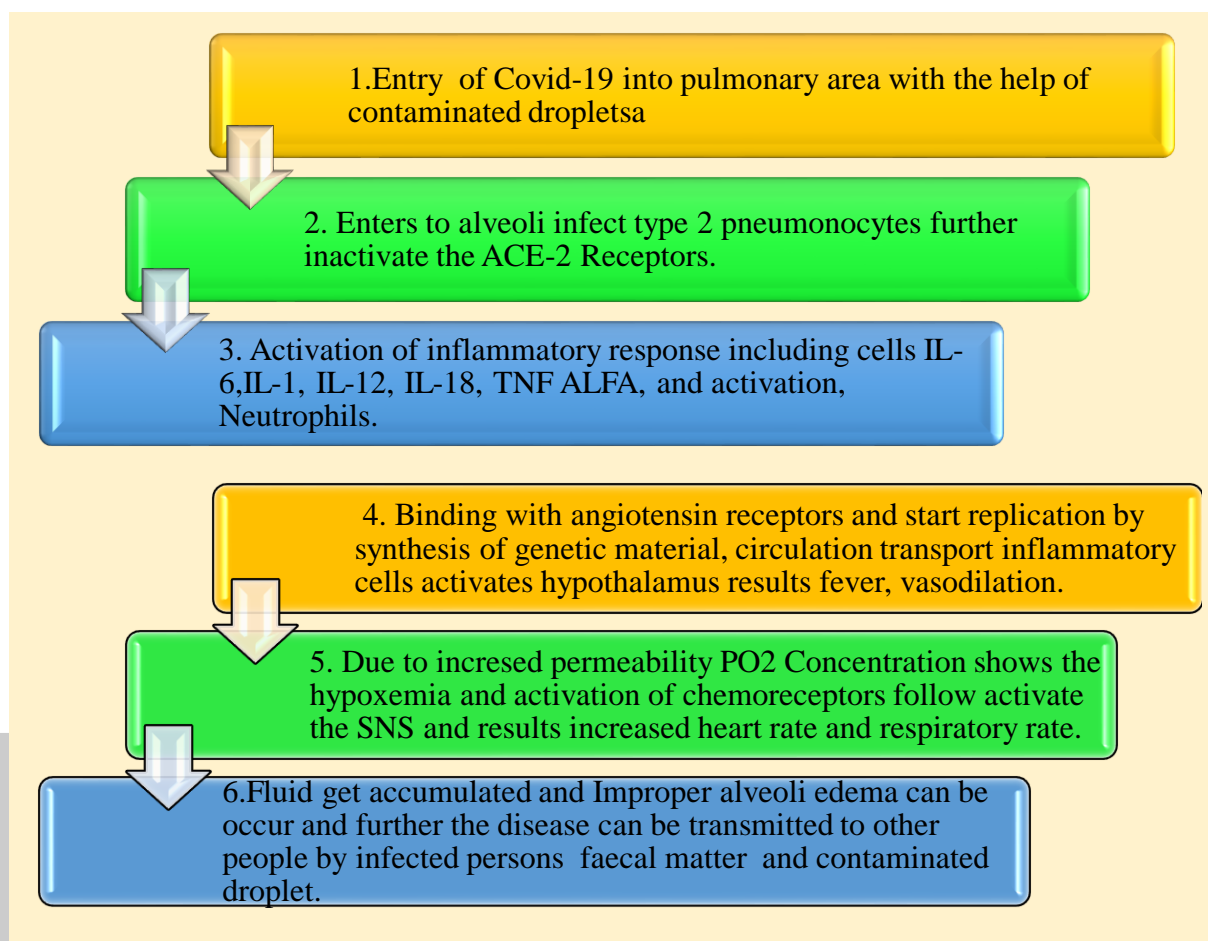


Fig. no. 2. Life cycle of COVID-19 in humans.

3. ROLE OF CLINICAL PHARMACIST DURING COVID-19 CRISIS:

3.1: Become Updated About Recent Knowledge About Disease Condition:

Pharmacists can play a key role as the information specialist about pandemic nowadays genesis of the COVID-19 pandemic occurred since from a year, the disease condition is modified daily and it's uncertain how long the pandemic will last. Pharmacists also give importance to preventing measures to control pandemic spreading in society the disease status is changing day by day new symptoms are found recently.^[10,12]

3.2: Keep Awareness in Society:

Patient counselling to society will be show effectiveness in control and prevention of the spreading pandemic the person who has a lack of knowledge about disease and sign symptoms and hygiene and health status maintenance beware of a pandemic can be effective for defending against its spreading all over the world^[10,12]

3.3: Mitigating Adverse Consequences:

To minimize mitigating adverse consequences pharmacists act by showing a better role by being aware of the pandemic status i.e. Update about illness and its progression and provide proper awareness in the society to minimize/prevent the spreading of the pandemic in society. As per the state of pandemic changed the adverse consequences are precipitated into more numbers to manage that pharmacist and pharmaceutical department can give suggestions of improvement to the system and minimize the worse condition^[8]

3.4: Patient Counselling:

Pharmacists can act by showing their significance by awareness providing in society, providing proper information about the disease. Pharmacists can show their role by clarifying feelings of fear in society i.e. What to do, how to change the person's lifestyle, and prevent spreading of disease in society providing awareness, proper information about personal hygiene maintenance also they show better role in infection prevention and disease management.

3.5: Guidance to Patient For Minimizing Stress:

a) *Mental Health Management:*

- Negative thought minimization.
- Reduce over thinking.
- Be always positive.
- Believe in system.

b) *Physical Health Management:*

- Exercise.
- Yoga, meditation.
- Healthy diet.
- Hygiene.
- Relaxation.

c) *Health Management*

- Believe in supreme power.
- Develop your gratitude.
- Help needy persons.
- Donate money for relief from the pandemic.
- Do concentration on goals^[18]

STRESS: Nowadays, whole world is suffering from Covid-19 pandemic and rate of transmission and changing the form day by day shows the mental and physical disturbances on human. Results mental changes, fear about pandemic and changed life style.

It can lead to,

- Cardio vascular disease.
- Obesity.
- Diabetes.
- Musculoskeletal disease.

PREVENTION:

- 1) Breathing exercise.
- 2) Meditation.
- 3) Yoga.
- 4) Healthy diet.^[19]

Fig. No. 3: Importance of Stress Management.

3.5: Key Role of Pharmacist In As Drug Information Experts:

In a pandemic the pharmacist play role by proper drug information and establishing emergency drug formularies, monitoring and resolving drug shorting in society, and also show abilities like remote pharmacy survives to prevent human to human infection by keeping social distancing in society give the proper pharmaceutical care educating the public about infection and drug evaluations.

3.6: Importance of Sanitation and Hygiene:

Showing awareness about sanitization and hygiene by providing proper information about the effect of frequent hand wash and avoid touching nose, mouth, eyes, and keeping a safe distance between society importance of sanitization and hygiene can be shown a better effect in protection and avoidance of spreading disease in society^[5]

4. IMPORTANCE OF HERBAL AGENTS AND THERE SIGNIFICANCE:

4.1.: Ashwagandha:

Introduction: Ashwagandha is traditional herb in Ayurveda belonging wide curing approaches. Powdered form of ashwagandha gives benefits on nervous disorders, reproductive system and improves immunity with its cell mediated mechanism. On another side it acts on free radicals for its anti-oxidant effect.

Mechanism: Ashwagandha have action on chemical mediator control specially like IL-6, IL-8, IL-18 and TNF- ALFA are significantly involve into inflammation of the respiratory tract. Inhibition of the ACE receptors done during the action of chemical constituent named Withanone interact with the protease of SARS CoV-19 having much more effectiveness found when studied under molecular docking process.

Family: Solanaceae

Biological name: Withania Somnifera.

Biological source: Dried roots and stems of plant Somnifera Dunal.

Chemical constituents: Withanone, isopelletierine, anaferine, cuseohyryne, anahygrie, withanolides, Withaferins.^[24]

4.2: GUDUCHI [GILOY]:

Introduction: Giloy used due to its better Anti-inflammatory properties, hence most time it is used to cure the arthritis as well as spasm conditions. Whole plant, roots and stems have more amount of chemical constituents so used as biological source in powdered form.

Mechanism: Immune enhancer and cytokine demodulators activity helps to enhance phagocytosis of macrophages towards hazards antigens. Improve cellular oxygen activity and levels of nitric oxide more production of macrophage and spleenocytes taken place results activity of immune boosting.

Family: Menispermaceae.

Biological name: Tionospora Cordifolia.

Biological source: Whole plant of Tinospora cordifolia.

Chemical constituents: Alkaloids, diterpenoids, lactones, glycosides, steroids, sesquiterpenoids, phenolics, aliphatic compounds, polysaccharide.^[25]

4.3.: YASTIMADHU:

Introduction: liquorice is plant commonly used due to its aromatic, sweet flavouring properties in candies and some other products. Sweet taste is readily available so minimum quantity of sweetening agent required when formulation would be carried but without its purpose it can't use as sweetener because of associated adverse effects like hypokalemia hypotension, weak muscles, fatigue etc. research have proven liquorice chemicals forms are active to fight against SARS CoV-19 infection.

Mechanism: Glycyrrhizin is active Phytochemical constituents within liquorice replication and adsorption of protease produced by virus moiety protected up to certain limited time. Compounds avoids receptors binding covering the protein spike over virus infection to respiratory cells would be avoided.

Family: Fabaceae.

Biological name: Glycyrrhiza glabra

Biological source: Dried roots of the liquorice plant.

Chemical constituents: Anethole, Glycyrrhizin, isoflavene glabrene, Isoflavene glabridin.^[26]

4.4.: PIPLI:

Introduction: Pipli consists immunomodulator, Antipyretic, Anti-infective activity. Piperine is most common agent from pipli proven that beneficial against SARS CoV-19.

Mechanism: Chemical agents as such prostaglandins, leukotrienes production is reduced utilizing this agent i.e. cyclooxygenase cycle is interfered so the inflammation response would be cured. Pipli consists some extract which are previously used to treat bronchospasm occurred due to viral or bacterial infection.

Family: Piperaceae.

Biological name: Piper Nigrum.

Biological source: Dried ripe fruits of plant piper nigrum.

Chemical constituents: Piperinre, piperidines, pyrrolidines, safrole, amides.^[27]

4.5.: GINGER:

Introduction: Ginger belongs to rhizome species of plant traditionally used for cooking purpose in India and it is easily available all over country. Immune booster and antiviral chemical agents helps to fight against infection. Special chemical constituents have properties to inhibit protein synthesis within viral species due top its better pharmacokinetic effect over body.

Mechanism: 6- gingerol active and special phytochemical substance poeses activity against viral protein material due to more affinity to binding with receptors than that of viral genetic material results lowering of infection caused by antigen species. Protease within SARS CoV-19 have low affinity to bind with receptor than 6-gingerol.

Family: Zingiberaceae.

Biological name: Zingeber officinale.

Biological source: Rhizome of plant Zingiber Officinale.

Chemical constituents: 6- Gingerol, Zingerone, Shogaols, Gingerols.^[29]

4.6.: TULSI:

Introduction: green leafy plant having grater amount of chemical constituents shows benefits of symptomatic and cellular activity correction which induces inflammation within patients body. From ancient time it is utilized as curing approach to respiratory system.

Mechanism: Tulsi direct acts on natural killer cell and T-Helper cell which are cause of inflammation. Aromatic properties within it helps to symptomatic curing as expectorant and soothing agent so it utilized in respiratory inflammation from long time ago.

Family: Lamiaceae.

Biological name: Ocimum tenuiflorum linn.

Biological source: Green leaves of plant Ocimum Tenuiflorum.

Chemical constituents: oleanolic acid, ursolic acid, rosamarinic acid, eugenol, carvacrol, linalool, beta-caryophyllene, eugenol, germacrene, terpenes.^[28]

4.7: GARLIC:

Introduction: garlic plant have aromatic and pungent tastes properties commonly occurs in India. Garlic consists number of essential oils are good to cure diseases of heart, brain, like ischemia. Most commonly this plant is used to cure the cholesterol related diseases.

Mechanism: garlic posses 18 moiety of essential oil in which 17 are organosulphur derivatives. Organosulphur derivatives are able to bind with ACE-2 receptors. More affinity of essential oil towards receptors block entry of viral protease which enhance the curing chances by multiple folds.

Family: Amyryllidaceae.

Biological name: Allium sativum.

Biological source: bulb of plant allium sativum.

Chemical constituents: allicin, ajoene, diallyl polysulfides, vinylthiols, S- allylcysteine, flavonoids.^[30]

4.8.: TERMERIC:

Introduction: Turmeric is a traditional rhizome species used for various pharmacological aspects specially for anti-bacterial and antiseptic activity. Release of mediators during inflammation after cell injury corrected due to presence of certain chemical constituents. Newer technology Carbon Quantum Dots have proven that antiviral power of turmeric would be enhanced and utilized to fight against SARS CoV-19 with receptor antagonism.

Mechanism: curcumin is active constituent in turmeric helps in various symptomatic disease correction reducing agents like cytokines, chemokines. Specially in ancient time it is used as antipyretic effect and traditional Ayurveda have proven that it would be utilized to cure ovalbumin induced bronchoconstriction and histamine release in airways of the guinea pig. It reduced bradykinin levels helps in cough suppression as well as Carbon Quantum dots technology helps to prevent the infection caused by SARS CoV-19 viral protease.

Family: Zingiberaceae.

Biological name: curcuma longa.

Biological source: Powdered rhizomes of plant curcuma longa.

Chemical constituents: curcumin, dexamethoxycurcumin, bisdexamethoxycurcumin, turmerone, germacrone, atlanone, zingiberene.^[31]

5. BENEFITS OF AEROBIC AND ANAEROBIC EXERCISE:

Introduction: Aerobic and Anaerobic exercises are not much more important in COVID-19 medical therapy but into healthy uninfected person and post infected person primary need is to maintain there hypoxic status for proper pulmonary function. Improvement in oxygen level is direct link with immune system and antigen will not be able to enter in cells to infect pulmonary area. Asanas and pranayama are more prone to maintain oxygen during infection so hypoxic status would be cured and multiplication of antigens DNA or protease stopped. As we all know that asanas and pranayama aren't seen in any proper therapy but significantly improves quality of life and reduce chances to get infected.

1] Prone asanas:

- a. Half locust pose. [ardha shalabhasana].
- b. Locust pose. [shalabhasana].
- c. Cobra pose. [bhujangasana].
- d. Sphinx asana.
- e. Crocodile pose. [makarasana].
- f. Superior posture. [jyestikasana].
- g. Reversed corpse pose. [advasana].
- h. Flipping fish pose. [matsyakridasana]^[32]

2] Pranayama:

- a. Anulom vilom.
- b. Kapal Bharati.
- c. Diaphragmatic exercise.
- d. Pursed-lip brathing.
- e. Breath holding time^[33]
- f. Bhramari pranayama^[34]

Benefits and mechanisms:

Pranayama is used to cure the oxygen levels of the lungs and reaches the clinical approach to correct the pulmonary damage caused due to infection.^[35] Oxygen saturation of a person is an important fact to lower the efficacy of genetic material to binding with ACE-2 receptors.^[32] Pranayama has proven enhancement in O₂ levels multiply curing approach by multiple folds. Prone asanas help to improve patients' quality of life associated with cardiopulmonary function and recovery rate when combined with medication therapy.^[32] *Bhramari Pranayama* is nothing but slow respiration breath-holding activity and blow out associated with creating echo-like honey bees along with covered hands over eyes. Humming produced during this procedure leads to more production of nitric oxide which is an anti-inflammatory agent inbuilt. Nitric oxide acts on viral genetic material direct inhibit the multiplication of DNA or RNA and improve autocrine hormones that resist pulmonary damages.^[34] psychoneuroimmunology is a recently found branch of biomedical science that has proven that psychological disorders directly relates to the immunity power of human beings and in this case, 18% stress, 20% nervousness, and 20% other psychological and nervous disorders are found. Aerobic and anaerobic both exercises minimize stress and psychological disorders due to their significance of relaxing and improvement into nitric oxide level also taken place so the sympatholytic effect is produced disorders like stress, anxiety, fear would be cured.^[36]

CONCLUSION:

As per our study, the review can depict the importance of new success in pandemic by improvement like the following condition of society:

Pharmacists can show a key role in the prevention and control of the coronavirus or covid-19 spreading. Provide important information about a social awareness about Disease state. Introduce the importance of sanitation and hygiene and be with the system. Proper counseling to patient and drug information expertise enhances to mitigate the chances of spreading disease. To follow the pharmaceutical care and education about home herbal remedies and herbal agents which are preferred by AYUSH and the government. The selection of this topic is done focusing on the severity of disease spreading and move towards a healthier lifestyle would enhance chances to fight against the situation at this time we are suffering through.

DISCUSSION:

Nowadays the whole world is in complicated condition due to COVID-19 which gets worse day by day. We have discussed this topic for the improvement of pharmaceutical knowledge about the pandemic and show better prevention and control of the disease. The disease is getting modified itself as the days are going on. The pharmacist can introduce his identity to society by contributing his part of life in control and prevention which will be more beneficial for the whole Pharma field. The reason behind the discussion on this topic is the way for the contribution of the pharmacist and achieving success in new targets. We have also discussed knowledge from other department like AYUSH MANTRALAYA and disaster management dept. This shows a proper role in social awareness and improvement in strong immunity power which is more helpful for achieving the targets for and control of the COVID-19 crisis.

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