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Role of Telemedicine in communicable diseases WSR COVID19 pandemic - a review

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Abstract-

Prior to the evolution of technology, physical examination used to be the only means of assessment of patient necessary for the diagnosis of the condition. With a greater awareness of health and socialisation of technology, every sector of the society gradually got used to with a number of health monitoring gadgets, mobile devices and a number of internet accessing application. As communicable illnesses may spread through channels like air, water or physical contact physical assessment of a diseased person becomes difficult. In such cases other measures of communication like virtual contact, telephonic conversation etc prove to be helpful in the management. These measures are useful even in case of data transfer. This paper primarily focuses on utility of communication alternatives in healthcare along with its merits and demerits

Keywords- Communicable diseases, communication alternatives, merits & demerits

Introduction-

Corona virus, a genus of the corona-viridae family, may give rise to disease in animals or humans[1, 2]. In humans, corona virus is known to cause infection of respiratory tract. It consists either of common cold or even leads to serious respiratory illness. The recently noticed corona virus variant is known to cause COVID-19 disease[1]. This variant is considered to be originated in Wuhan, China which propagated to other regions of the world[3]. The initial signs & symptoms of COVID-19 are usually found to be fever, dry cough, breathing difficulty or even dysponea[4,5]. Most susceptible population which can be considered to be prone in developing the disease in the intensive expression is the senior citizens. Even the people with underlying medical problems such as fluctuating blood pressure, cardiological problems and diabetes also tend to get influenced with it[1]. Due to a faster and wider occupancy of population by the condition, World Health Organization (WHO) pronounced this phenomenon as a pandemic [6]. Social distancing has played a crucial role in retrieving control over the condition [7, 8].

In such a difficult time, Tele-health can be considered as an important tool for the society, health care providers, and with COVID-19 affected patients. As COVID-19 is a contagious disease, affected people have to be kept in quarantine. So in such cases, tele-health or e-health can enable their contact with health care system for advice on their health issues. Hence the tele-health provision is believed to be helpful in diagnosing, treating and controlling diseases in this COVID-19 outbreak[9].

Telemedicine

Telemedicine has to be introduced primarily to provide ease of approach to the people who cant reach the healthcare service. Source and services like internet, digital storage systems and communication technologies like telephones, mails etc. can be used for assessment of personal health, diagnosing disease, its treatment and even the earliest possibility of prevention of disease and injuries. It is also a tool for improvisation in research and in evaluation as well as educating health care providers, all in the interests of improvisation of the health of individuals and their communities[10].

Telemedicine Applications

Telemedicine is one of the types equivalent to e-health. It is the channel that connects consumer that is patients with the source (healthcare providers, medical practitioners. It is even helpful in connecting various health care providers all together under a same platform. In case of practitioner to patient contact, the practitioners may utilize either of the tele-medication tools suitable for carrying out technology-based patient consultation. These services are provided using telephones, video devices that using internet, landline phones. Online communication platforms viz. whatsApp, google Meet, Zoom, Facebook, Messenger etc or internet based digital platforms are also used for telemedicine. Irrespective of the tool of communication used, the core principles of telemedicine practice remain the same. Telemedicine applications can be divided into different types. These are dependent on the mode and the purpose of the communication, the urgency of communication and the participants taking part in the process. Telemedicine is practiced for following ways.
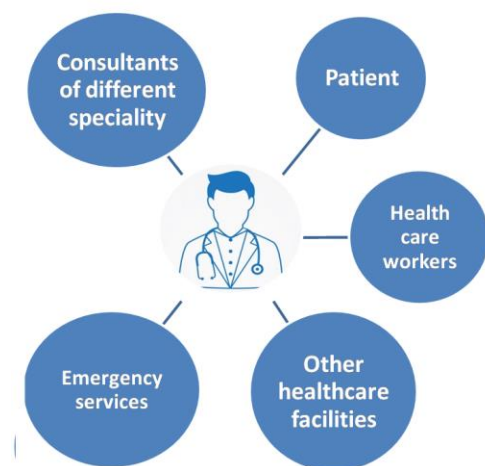

Fig. 1: Types of communications in Tele-medicine

Technology used & mode of communications

With the advancement in the technology, multiple technologies media are available for the service. Each of these methods has their probable strengths, weaknesses. With their functioning capabilities, these services are suitable in different scenarios as per their adequacies. It is need of the time to understand the strengths and limitations these available variety of media. Since ages, patients are being examined by the traditional methods consisting of darshana (observation of visible signs), sparshana (palpation, percussion or examination through sense of touch), prashnana (interrogation). Tele-communication and medication practiced today have many merits but they still lack the experience that can only be gained through physical examination. It may be attained with research in future.
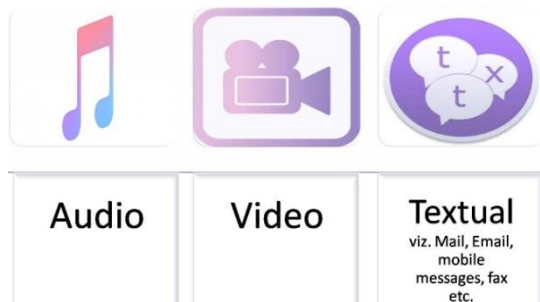

Fig 2: Modes of communication in telemedicine

1. Video communication (VC)

There are various healthcare providing sites, applications that provide video conversation through the medium of internet, such as Practo, mobile apps that uses mobile platform for communication.

Strengths- The chief merits of video consultation or video communication over other methods is that VC is closest to an in person-consult. The examiner can detect changes in the expressions of the person while interaction. This can be helpful in perceiving visual clues to the examiner. As VC is a real time interaction, person may provide any fresh complaints, modifications or improvements in the symptoms. Patient identification is easier and reliable in the VC than any other medium. Another most important merit of VC is, it helps in conservation of time for both the contestants. One doesn't need to travel to their RMP for consultation.

Limitations- Along with merits VC accompanies certain demerits along with it. This service will always be dependent on the quality internet connection at both ends. This service demands a either a advanced smart phone or good quality camera assembled monitor screens or devices for the communication. Probability of misusage of the service cannot be denied as well.

2. Audio Communications (AC):

Phone, Voice over IP (VoIP), audio communication Apps etc.

Strengths- This is another easier way of communication in medical communication. As per today almost everyone has a personal mobile phone which provides easiest way of communication. And hence for this service no specified infrastructure is necessary. AC is always convenient and faster way of

communication. It has unlimited reach and it is most suitable method even in urgent cases. As there is no visibility of either parties, the privacy is very well ensured in this system.

Limitations-

In this system of tele-communication, non-verbal clues may get missed. Due to lack of visible contents, practitioner has to be dependent on audible inputs alone. For instance, in ailments with illness consisting wounds or structural deformities, where observation is must, AC will be insufficient in such conditions. In medico-legal cases, other people may present themselves to be the real patients that would lead to biased conclusive evidences. In case of poor cellular networks, this system of communication can fail to deliver its cause.

3. Asynchronous Communication:

Email, Fax, Recordings etc.

Strengths- It is one convenient and easy method, most suitable in case of documentation and its transfer to suitable personnel. Images from radiological investigations like sonography, MRI's etc, personal data like discharge summary from hospitals, previous medication/drug records etc And Lab investigation reports can be shared through this medium. As the devices can accommodate in smaller spaces, no separate infrastructure is required for its utility. It is best helpful in situations of follow ups, long distance communications and especially elderly patients.

Limitations- This system cannot provide a real time and faster interaction. It relies solely on the expression of the patients. In this system, patient identification is difficult. One has to rely on documents presented and thus authenticity may remain doubtful. Communication most of the time can be delayed as practitioners may or may not be able to attend the mails/faxes immediately.
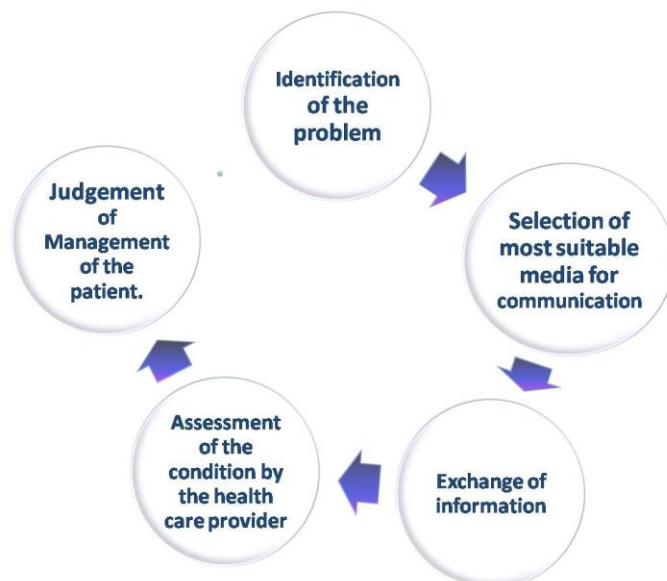
4. Text Based communication systems:

Now a days, social media has engulfed farthest of the distances across the globe. A number of mobile applications, mobile based short message services (sms), websites and internet based messaging services such as Whatsapp, Messenger etc. are easily available at the fingertips for communication.

Strengths- It is convenient for almost all the age groups. The processing is comparatively quicker thus reduces time. It is suitable and reliable in urgencies as well. These apps can maintain record of communication that can further be shared via internet or cellular network at any hour. Other than a working mobile phone & internet service no separate infrastructure is required for working. Communication can take place in real time.

Limitations- As this communication is done solely in textual manner, none of the examination criteria can be achieved. This may lead to insufficient data supply to the practitioner that may ultimately lead to misjudgment. In this system it is difficult to establish a rapport among health care provider and the health seeker. Identity of both the parties may remain doubtful.

Process of tele consultation:

Fig 3: Process of tele-consultation

Tele consultation or tele-medicine is a multi stepped process that allows freedom of choice to the user. Person may choose a suitable media i.e. video consultation, audio or telephonic consultation or the other types of conversation as per his/her concern. These media helps in sharing the information among the parties through which the consultant can draw a suitable conclusion. In necessity, consultant may refer/share the same information with other experts and thus manages the condition accordingly. This is the simple process of teleconsultation.

Discussion

Symptoms of covid19 resembled to that of common cold or flu. Fever, cough, severe anorexia, extreme lethargy are chief and commonly observed symptoms in the patients worldwide. Many other patients complained of disability of sense of taste and/or smell, whole body pains, headache or light headedness, throat irritation, breathlessness, red eyes, loose stools and even rashes on the skin [11]. As equivalent symptoms were observed in all parts of the globe, World health organisation claimed it to be a pandemic. The major countries forced its citizens to remain indoors for a long period of time. Moreover, being a contagious disease, Covid-19 made physical examination of patients quite a difficult task. Physicians had to and still have to take excessive precautions as to examine large number of patients with same infectious condition. Though India has achieved the population ratio of doctor to patients of 1:1000 as per the regulations by WHO in 2018[12], a rapid spread of COVID19 would have caused imbalance in the same. A positive RTPCR test and/or changes observable in the chest CT scan are

confirmatory diagnostic criteria for COVID19. People with fresh active infections and positive lab reports had to commence treatment at earliest hour to avoid progression of disease. Telemedicine proved to be a useful tool in reducing time between diagnosis and commencement of medication. This is best suitable as far as the symptomatic assessment of the disease is concerned.

Ayurved is not just a system of medicine but a way of living life. The sages like Charak, Sushrut etc. taught and practiced this system in ancient era which is still being utilized in the present time. Ayurved system put forward many methods in diagnosis of the condition which can basically be divided into,

1. Darshan (through the sense of sight viz. visible deformity, texture of skin, personal expression etc.)
2. Sparshan (through the sense of touch viz. temperature, consistency, naadi pariksha etc.)
3. Prashnan (interrogation that may include detailed history taking, questionnaire etc.).

As far as the symptoms are concerned, Covid19 can be compared to abhinyas jwara described by sushruta acharya in 39th chapter in uttara tantra of sushruta samhita as well as agantuja jwara described in the chikitsa sthana of charaka samhita[13]. Darshan examination can be achieved through video conferencing or chatting and prashnan can be achieved through video as well audio chatting. But features examinable only by sense of touch like fluctuation in temperature, pallor etc cannot be assessed by these media. In advanced condition, the disease gets multiple organs involved[14]. In such cases when the general condition of the patient worsens and he has to be hospitalized, telemedication can only be used among consultants of different specialties irrespective of the system of medicine.

Merits: Telemedicine is the most important fruitful tool in management of suspected quarantined population where consultant had to interact with the patients, intentionally staying away from them. As Covid19 converted into a pandemic, consultants had to reach more number of patients at a time, which could be achieved through video or audio conferencing and even media like Whatsapp and messengers.

Limitations: Being a contagious condition, in worse conditions where patients had to be hospitalized, tele medicine methods could not be used. As tele medicine is sort of a luxurious service, economically backward population who cannot afford multimedia phone or video devices, people with special needs and (especially elderly population) people unaware of internet facility, could not utilize tele-consultations even in extreme need.

Conclusion:

In the crucially critical times of covid19 pandemic where people had to be seated at home for own and social safety, telemedicine has given a new direction in the field of health science. Irrespective of the system of medicine, doctors and health professionals can easily help the patients living far away from their place with the suitable treatment and medicine. Ayurvedic diagnostic tools like darshan and prashanan can be achieved through telecommunication. As the system needs either specific instruments, equipments like devices with video camera, internet facility, telephones, fax machines and knowledge of handling all of them, telemedicine can turn out to be limited in some sectors of society. With advancement and research in the field, these obstacles may be ruled out in future.

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