

Review Article

Telenursing-an emerging concept in reducing COVID-19 hospital occupancy

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ABSTRACT

Tele-information and communication have led a global revolution in solving the scarcity of health care workers. In the vision of health for all, different global leaders have initiated many public health reforms to address the health care needs of citizens, like e-Sanjeevani in India. COVID-19 created an acute shortage of nurses, as well as the rising cost of care and hospital occupancy which are major hurdles to address basic health needs. Telenursing is a novel field that utilizes innovative technologies to offer safe, effective, and ethical care promptly by providing. Telenursing may provide a means to overcome some of the challenges faced by patients by providing easier access to cost-effective care and equitable distribution of health care providers. Globally, telenursing is an emerging and rapidly expanding area for professionals and offers unlimited opportunities for its members.

Keywords: Telenursing, COVID-19, Hospital, Bed occupancy, Orem's theory

INTRODUCTION

The key issues faced by health care across countries include access, equity, quality, and cost-effectiveness. These problems are further aggravated and intense at times of outbreaks, pandemics, and disasters in the face of an already frail and over-burdened health system.¹ Technological advancement has taken major strides in bringing liberation to divergent human wants and gratifications. The use of information technology in the healthcare sector has been proven to significantly improve quality of patient care and nursing profession, being a major part of healthcare system, cannot afford to procrastinate.² In 1997, Apollo group of hospitals in India 1st started with telemedicine then it expanded further with various services like telenursing, teleconsultation, teliagnosis, telemonitoring.²⁻⁴ Telenursing is defined as use of telecommunications and information technology to provide nursing practice at a distance.⁴ In this contemporary approach, modern-day information technologies are used to deliver nursing care to people where health care services are inaccessible to them.

SCOPE OF TELENURSING

Scope of telenursing is expanding and gaining popularity because it can provide a superior quality of care at distance, it can be executed in health care centres, nursing and medical education intuitions, and even in research and development settings. (Figure 1).²



Figure 1: Scope of telenursing.

A systematic review published in 2015 concluded providing telenursing care in chronic patients has led to less hospital occupancy, improves psychological distress, increases the effectiveness of treatment regimen, reduces morbidity and mortality which in turn improves the quality of life of an individual.⁵

METHODS OF DELIVERING TELENURSING

Technology to deliver nursing practice and to deliver nursing empathy health care in a distance mode is telenursing.⁶ Though the delivery medium of nursing care differs from the use of technology and may necessitate competencies related to its use to deliver nursing care, the nursing process and scope of practice do not differ with telenursing. A nursing officer deployed in the technological process of delivering his/her services continuously assess, plan, intervene and evaluate the outcomes of nursing care, but they do so use technologies such as the internet, computers, telephones, digital assessment tools, and telemonitoring equipment, through a point-to-point connection using a private network, web-based health patients service site, programmed timely surveillance. Bearing in mind that health services now provided via tele technologies have expanded, the term telehealth is used to capture the breadth of services.^{7,8}

BENEFITS OF UTILIZING TELENURSING DURING COVID

In this tragic situation of COVID-19 nurses are the only profession who were, 24/7 working in the frontline, starting from screening the suspects, care of ill infected patients, enduring all preventing measures, educating COVID appropriate behaviour in hospitals and community.^{9,10} In general, nurses' roles are providing physical, psychological, social, and spiritual support to people who have been affected by this pandemic.^{10,11} Nursing professionals have educated competencies comprising social, personal, methodological, and professionalism, along with a sound skill of technology as which creates a form of empathy towards all the patients who may be seating far away from him. Telenursing creates increase access to health care, even in the rural or the Tribble parts of the country, this process is more economical so that its service can be benefited by all the citizens. Telenursing is a better option for addressing the shortage of nurses, for saving time, and preventing cross infections for the patients' attending hospitals in this current pandemic situation with only.

Digital door

India is a developing nation with a population of more than 139 crores. Data shows, about 59.2% of health workers reside in urban areas where only 31.15% of the whole population resides, and health care workers away from the rural areas where 68.85% of the population resides.^{12,13} Adding to this, as per NHA 2018, the stock density of doctors and nurses/ midwives are 8.8 and 17.7,

respectively, per 10,000 persons which is much lower than the WHO standard.¹⁴ Furthermore, there is a hospital bed and resource shortage during COVID-19. A mean of 307.1 hospital beds /100,000 population was available globally during COVID-19 whereas it is <200/100,000 population in southern Asia and lower middle- income country.¹⁵ As per the national sample survey (2017-2018) and national health profile 2019, India possesses 1.9 million hospital beds, 95, 000 ICU beds, and 48,000 ventilators which is quite low (2.8 times lower) to accommodate patients during the COVID-19 outbreak.¹⁶

Due to the rapid spread of COVID-19, countries facing extensive glitches with respect to financial, societal and most importantly healthcare-related issues. To curtail the rapid spread, the government has imposed restrictions in travel, lockdown, closure of regular OPD services which caused difficulties in the accessibility of healthcare services.¹⁷

In the face of such realism, the use of information and communication technology is professed of having the potential to improve accessibility to deliver health services effectively and cost-effectively. Additionally, nurses bridge the gap between doctor and patient, provides holistic care, offers trustworthy information and support patient to take an informed decision. Therefore, the implementation of a well-organized telenursing program will enable to make health care services more accessible, timely, and cost-effective.

Telenursing diagnosis

The telenursing platforms are designed in such a way that the nurse can perform a physical examination and assess patient parameters autonomously or in association with other health care providers from the same or different geographical location.¹⁸ For successful diagnosis and implementation of nursing care, computer-based systems with video and audio features must be integrated with medical monitoring systems. Patients' condition can be assessed by asking questions about their health status through video conferencing, using devices like bluetooth enable BP monitor, oxygen saturation, telephonic ECG recording, etc. During this COVID-19 pandemic, asymptomatic positive or patient with mild symptoms can be followed up regularly by phone, video conferencing, or through geolocation tools.¹⁹ Moreover, during this pandemic telephone triaging system can be used to screen the patient and guide them for appropriate level care. Study shows there is 65% reduction of admission to the emergency department.²⁰

Teleconsultation

According to data from CDC, 81% of COVID-positive patients are mild to moderate symptoms, 14% have severe symptoms and 5% exhibit critical symptoms in china. Whereas in the US, 14% of clients needed hospitalization and 2% needed admission in ICU. Further, COVID-

positive patients are potential for rapid deterioration 1 week after the onset of illness as the median time from onset of illness to development of pneumonia, to development of ARDS and ICU admission re 5-8 days, 8-12 days and 9.5-12 days respectively.²¹ At the same time, there is an acute shortage of hospital/ ICU beds as well as health care workers. Therefore, mild to moderate COVID patients can be trained to care at home and regular telemonitoring can be done to identify the complication at the earliest. Thus, we can forfend hospitalization of moderate cases and those bed can be preserved for the care of severe or critical cases. Empowering the patients by providing necessary information about the disease condition and home care helps to make informed decisions, cope effectively with illnesses, and faster recovery. Specifically, they need to be educated on COVID-appropriate behavior at home, home isolation guideline, diet, stress management techniques, regular monitoring of SpO₂, and breathing exercises through video conferencing.

Telemonitoring

Patients with mild clinical presentation of COVID may not require hospitalization and they can be monitored regularly and managed at home. They need to be assessed for heart rate, respiratory rate, temperature, cough, how they are feeling, their psychological state. So, any kind of abnormality can be identified in the primary stage. Moreover, post-COVID conditions like depression, anxiety, mood changes, the unmasking of existing diseases, or even reinfection can be well managed by regular counselling and support through telenursing and also collaborating with other health and allied discipline.²¹ Study shows monitoring patients through telephone call following discharge reduces adverse events and readmission.²²

Virtual care

It is evident from the various studies that, patient care and guidance through the telephone is easy, safe, effective, economical, develop a confidence-inspiring relationship between patient and caregiver, improve patient satisfaction and enhances health care outcome.^{23,24} Patient care can be provided virtually in the home setting. During the time of acute shortage of hospital beds, early discharge of hospitalized patients and referring to home health care would be a suitable strategy for decreasing the overload of the patient in hospitals.²⁵ Utilizing home care delivery, along with basic care management of chronic diseases, wellness promotion, and information delivery on-demand would be rendered. The long-term in-home ventilator engagement (LIVE) program is a valued creation that offers ventilatory support to clients at home through a telenursing platform and in collaboration with medical professionals and family members. Thus, it incapacitates barriers to avail health care services like travel and cost at the same time decreases the risk of contracting COVID infection.²⁶ The various study has

proven that telenursing enhances patient care outcome. Instances like post-partum support through telephone calls improved maternal and child health outcomes, improved baby's weight gain and lowered emergency visits.²⁴ But then again it is indispensable to recollect that, telenursing is a medium for care, and not a tool to replace high-quality nursing practice.

Infection control

E-health has a significant role in controlling infection. To curtail the spread of COVID-19, the government has imposed a strict lockdown and all outpatient services also stopped. In such circumstances, telenursing helps to provide support to people in need of medical care digitally that thwarts COVID spread.¹⁹ Moreover, telenursing prevents direct contact with patients, the health care providers identify high-risk contact at the earliest through contact tracing, hence lessening the risk of cross-infection among the public and HCW. Adding to this, regular monitoring of patient's parameters, counselling for maintaining strict home isolation, adherence to treatment protocol and adequate nutrition minimizes the chance of secondary infection.¹ Thus it diminishes the burden on health care providers, decreases mortality and morbidity. So, hospital beds and ICU beds will be available for critically ill patients who are in such need.²⁷

IMPLEMENTATION OF TELENURSING (APPLICATION OF OREM'S THEORY)

Theories are composed of a group of interrelated concepts that describes a pattern of reality. Nursing theories allow nurses to analyse and intervene in the care based on what it knows and what need to know. When nurses practice the care systematically and with rationality, then it would be more efficient, have better control over the outcomes of their care, and be able to resolve the current nursing issues.²⁸ The most prevalent theoretical framework applicable in nursing practice is Orem's self-care deficit theory because it can be easily applicable. Assisting patients and their families in this COVID pandemic condition will undoubtedly improve nursing practice. Orem's theory proposed by Orem is a combination of three concepts i.e., self-care, self-care deficit, and nursing systems.

Self-care refers to the activity performed by the individual for maintaining own health, development, and well-being like care of minor ailments, prevention of illness. As a result, self-care measures such as wearing a mask, maintaining social distance, and maintaining personal hygiene are strongly recommended for avoiding COVID infection. Self-care agency is the acquired capabilities to perform self-care, which gets influenced by basic conditioning factors. Age, gender, past health condition, health care delivery system, family support system, self-concept and self-awareness about COVID, mode of transmission and its prevention, total capacities

of the individual to act meaningfully in a particular scenario, and decision-making abilities may all influence COVID. Self-care deficit arises when the individuals are unable to meet the universal requisites like proper oxygenation, food and hydration, maintaining normal body temperature, airway clearance, comfort, and social interaction. Telephonic history gathering and telemonitoring via videoconferencing will be used to identify these health weaknesses and provide timely support and management guidance. The theory of self-care deficit explains there is a difference between self-care agency and therapeutic self-care demand which can be identified by the nursing assessment that needs nursing action.

A patient enters to telenursing COVID care pathway once they contact telenursing. S/he needs to be screened for COVID-related symptoms and should be tested to determine the confirmed case. If one is found negative, release from telenursing care pathway but referred for non-COVID care (Dengue, malaria, TB, influenza, etc.) as per local protocol. All confirmed cases need to be assessed virtually for risk factors (age >60 years, underlying NCD, high BMI, smoking, pregnancy, etc.), sign and symptoms (fever, malaise, chest pain, breathlessness, SpO₂, etc.), home condition (Isolation facility, ventilated room), self-care ability and support system. Based on assessment patient need to be triaged into wholly compensatory (severe and critical COVID 19 cases), partially compensatory (Mild and moderate COVID-19), supporting and. educative system (Asymptomatic cases). Asymptomatic COVID cases can be managed at home by educating patients and their family members about the need for home isolation, nutrition, hydration, maintaining respiratory hygiene using the medical mask by patient and care provider, minimizing the use of share space, limiting the number of caregivers, prevent movement from and to home, use of dedicated linen, utensils, regular cleaning and disinfection frequently used places, etc. patient can be released from isolation after 10 days. Partially compensatory cases can also be cared for at home as per home isolation guidelines along with symptomatic managements like antipyretic in collaboration with telemedicine departments. Patients need to be monitored regularly for SpO₂, respiratory rate, temperature, worsening of symptoms like light-headedness, chest pain, difficulty in breathing. Whereas wholly compensated patients need immediate hospitalization where there is a facility for oxygen therapy, mechanical ventilation, laboratory facility, and other emergency management. Once the patient recovered from a critical condition and is no longer infectious can be discharged early from the hospital and treated at home through telenursing which varies from case to case. Care includes a thorough assessment of oxygen need, self-care ability, moderate physical exercise, spirometry, position to decrease breathlessness, diet, hydration, etc. On the other hand, if the condition does not change or worsens for partially compensatory cases which need a referral to the hospital for further management and evaluation. This

telenursing model can be used for optimizing hospital bed beds and resource shortages during the COVID pandemic (Figure 3).



Figure 2: Importance of telenursing.

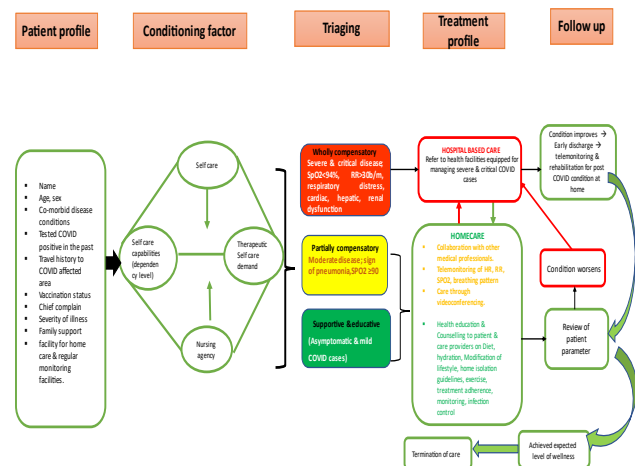


Figure 3: Management of COVID-19 patient in reducing bed occupancy through telenursing based on Orem's theory.

CHALLENGES

To overcome healthcare-related barriers, health sectors are using telehealth services by using information and Communication Technology to reach its services to the whole populace. It is expected to make health care accessible to all, reduce out-of-pocket expenditure, reduce suffering, and less the burden of the hospital by telehealth services. However, it is not being widely used in developing countries despite many government initiatives and policies. The barriers to adoption and implementation of telenursing services are: Collaboration barrier: Dearth collaboration with different specialty and super specialty departments, other stakeholders and technical teams are the biggest barrier for the development of telenursing. Policy barrier: There is no defined and uniform policy, protocol, rules and regulation

for smooth and safe implementation of telenursing services. Certification and credentialing barriers demotivate practitioners. Technology barrier: Remote patient monitoring, virtual care, counselling, etc requires access to smartphone applications that are not available to everyone. There is frequent connective issue in the rural areas. Thus, sometimes they need to travel to the provider's office to get live video consultation. On the other hand, the fast development of technology requires a frequent update of the application, and providers need to update themselves. Lack of clinical, paraclinical, and technical task force. Legal and ethical issues like confidentiality of patient's data, maintaining records, obtaining informed consent and mistrust in the telenursing system: Some clients may lack trust in the quality of services or information provided by telenursing.

CONCLUSIONS

People are having limited access to health care services due to finances, transportation, nonavailability of beds, and moreover fear of contracting diseases from the hospital during this COVID-19 pandemic. Telenursing is an efficient strategy to overcome healthcare barriers and to create awareness about healthcare-related information among the public. Many studies have reported that virtual care through telenursing promotes efficient use of scarce health care resources, improves communication, patient satisfaction, and reduces cost burden on the patient. A well-organized system, empowerment of nurses, coordination with other specialty departments is the key to the successful implementation of telenursing services. And lastly, it will also be encouraged, accepted, and supported by the common public.

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