Responding to "Covid-19"Pandemic: Quality Management and Preventive Strategies of a Hospital

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Abstract

The newly emerged public health crisis threatening the world with emergence or spread of a novel coronavirus named SARS - CoV-2 associated with higher infection rates and deaths especially elderly people and people with Hypertension, Diabetes Mellitus, Cerebrovascular and Cardiovascular diseases throughout the world. As of 17thJune 2020, 216 countries were affected with 83,26,825 confirmed cases including 4,48,081 total deaths. India has reported around 3.6 lakh confirmed cases with more than 12 thousand total deaths. To respond this pandemic, India needs to set-up an adequate, well equipped and dedicated health care facility to contain the spread of infection and manage the infected patients as well as providing protection to the healthcare workers (HCW). Quality management and preventive strategies of a hospital plays very important role for this purpose. Quality management is the fundamental feature of a hospital to establish customer satisfactions and desired outcomes. High quality care health services involve doing the right things, for the right patient, at the right time, in the right way to minimise the harm and resource waste. Preventive strategies especially infrastructure development & Infection prevention and control policies (IPC) are very crucial. The effective, safe, people centred, timely, equitable, integrated and efficient heath care delivery improvement with appropriate quality management system and preventive strategies will be helpful to combat with "COVID-19". This study highlights the "Quality management and Preventive Strategies of a Hospital responding to COVID-19" for providing better healthcare services in Indian healthcare management system.

Keywords**:** *COVID-19, Infection prevention and control policies, Infrastructure development, Patient satisfaction, Quality management*

Introduction

The world is grabbling with invisible, deadly pandemic threat posed by a small spherical particle with bulbous projections. A sudden outbreak of coronavirus disease 2019 (COVID-19) caused by infection with severe acute respiratory syndrome coronavirus (SARS-CoV-2) happened since December 2019 in Wuhan City, Hubei Province in People's Republic of China and rapidly spreading around the world[1]. On 30th January 2020, World Health Organization (WHO) declared a public health emergency on international concern and on 11th February 2020, announced a name for the new coronavirus disease: "COVID-19"[2]. The transmission pattern of "COVID-19" is mainly by direct or indirect contacts via respiratory droplets, contact routes and touching the objects used by infected person. An infected person suffers from most common symptoms like fever, cough, dyspnoea, fatigue, myalgia etc. Severe form of clinical condition needs urgent hospitalization[3]. As of 17th June 2020, India reported 3,60,483 positive cases with 12,058 total deaths &1,91,446 total recovered[4]. In this crisis, every individual of the country deserves a safe, cost effective and optimal standard of healthcare

services including test and treatment for "COVID-19" required for their survival[5]. Quality standard of care is the main area of domain in today's healthcare sector which may be improved through effective healthcare policies, human practices and well-developed healthcare management system. Some preventive measures or strategies may be helpful to provide satisfactory and quality care in hospital like formulation of norms, standards, infection prevention &control (IPC) measures (use of PPEs), infrastructure development, manpower planning, supply chain management, training programs, research and innovation, continuous quality improvement and use of technologies in healthcare system[6]. India needs an effective, affordable, quality-based healthcare services in hospitals to combat with corona virus outbreak ("COVID-19").

Quality management

Quality care is "doing the right things, for the right patient, at the right time, in the right way to achieve the best possible results". According to IOM (Institute of Medicine) and WHO, quality management is "the degree to which healthcare services for individuals and population increase the likelihood of desired health outcome and are consistent with current professional knowledge"[7]. Total Quality management is also known as Continuous quality improvement, Quality management and Total quality control[8]. Clinical governance and better human resource management practices are important in maintaining the quality standard care. India needs to focus on capacity building, enhancing accountability of health practitioners, managers, efficiency of resources, use of digital technology, research and innovation, IoT (Internet of Things), Management information system and Continuous improvement practices to contain the spread of pandemic disease in recent time and other life-threatening diseases. An approach to develop the quality policies and strategies in a hospital should be based on effectiveness, safety, culture of excellence and desired outcome to provide better health services[9]. In response to pandemic threat, it is essential to prepare a well-equipped dedicated hospital facility (DHF) based on maintaining content and delivery type of quality to overcome the global crisis[10]. A report (by WHO) shows that each year around 5.7-8.4 million people died and $1.4-1.6 trillion lost productivity due to poor quality care cost in low and middle-income countries, as well as 34% of patient experience disrespectful care with poor communication (patient dissatisfaction) worldwide[11]. Health is the fundamental right of every individual in this world. Social Health Care protection system also known as Universal Health Coverage ensures that the distribution of health services should be accessible, efficient, affordable, equitable and cost effective to protect the poor people against financial crisis[12]. The quality management of healthcare system can be done by sharing of knowledge, experience, facing the challenges, and spark the ideas related to improving institutionalizing quality[13].

A novel coronavirus is a new strain that has not been previously identified in humans. Healthcare workers are at risk while providing care to patients. Quality standard is dependent on three factors: (1) *Structure Input* involves investment in healthcare infrastructure. (2) *Process measu*res includes what and how care is delivered based on guidelines such as Infection Prevention and Control (IPC) policies (3) *Outcome* involves health status of patient or population [14]. The application of Shewhart Cycle, Total Quality Management model, implementation of ISO 9000 (ISO 9001, ISO 9002, ISO 9003) standard for ensuring operating requirements, quality assurance, testing and inspections in hospitals may be useful in setting the guidelines or policies of hospital to battle with "COVID-19"[15].

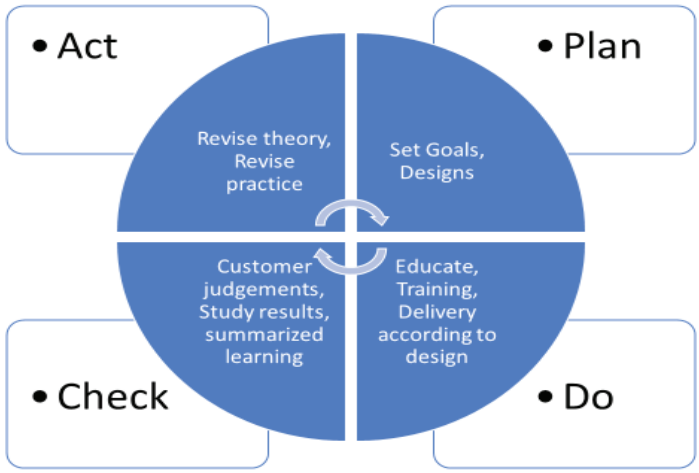

Fig:1. Shewhart Cycle: Plan-Do-Check-Act (PDCA cycle) [16]

The application of PDCA process to test the improvements was discovered by Walter A Shewhart in 1930. It helps in planning of SMART (Specific, Measurable, Achievable, Realistic, Time bound) goals and designed it in structured form for achieving the desirable outcome by providing training to the workforce and analyse the results and acts to implement revise the strategy and practices. In response to "COVID-19", it is essential to take prevention and precautionary measures to break the chain of deadly virus. Some preventive strategies of a hospital may be helpful to provide quality standard care to save the life of people to fight against "COVID-19".

Preventive Strategies

Infrastructure development

A well-established renovated healthcare system is required to overcome the new challenge "COVID-19". The Government of India has taken initiative for the development of health infrastructure and approved package worth of Rs.15, 000 crores for emergency response and health system preparedness to fight against "COVID-19". The main objective of this fund is to limit "COVID-19" infection in India through development of diagnostic centres, centralized procurement of essential medical equipment, drugs required for "COVID-19" treatment, strengthen and build national and state health systems to support prevention and preparedness for " COVID-19" and future disease outbreaks by setting up of laboratories, surveillance activities, innovation, pandemic research and development in healthcare sector. Basic requirements need to be developed in a hospital like quarantine centre, well equipped laboratory for testing, increase the number of bed capacity, thermal scanning facility, construction of isolation & suspected ward by maintaining adequate space in-between the beds. A temporary out-patient clinic outside the buildings should be set up to serve the asymptomatic patients[17]. A well-equipped dedicated facility hospital should have two building units. The first one will be an isolation space for laboratory confirmed cases. The second unit will be for suspected cases which includes family and hospital contacts who have potential contact with confirmed cases but waiting for laboratory confirmation[18].

Thermal screening

Thermal screening should be done at every entrance of the hospital to recognize the symptoms at the first point of entry to identify the suspected cases. Those identified by scanning have their temperature confirmed with a tympanic thermometer should be sent to "COVID" out-patientunit for further investigations. This strategy strengthens the identification and management of "COVID-19" cases and reduce the risk of exposure[19].

Social distance maintaining

Across the globe, countries have implemented a number of control measures to respond "COVID-19".

Social distancing includes ways to stop or slow the spread of infectious diseases. Social distancing is important because "COVID-19" spreads from person to person through direct or indirect routes[20].

Infection Prevention and Control (IPC) Practice

Infection Prevention and Control policies of a hospital is very important to stop the spreading of the infections. Every hospital should have their own SOPs (Standard Operative Procedures) and protocol should be maintained strictly. The application of appropriate precautionary measures helps to enhance the safety of patients and health care workers to control the infection. Hospital infection control committee plays a critical role to systematically address IPC practice in healthcare facility.

Hand hygiene

Hand hygiene is the primary step in taking precautionary measures and followed timely. Hand hygiene should be done with alcohol-based hand rubor soap before and after use of Personal Protective Equipment (PPE) and medical practices. Printed posters include medical and surgical hand washing steps should be pasted nearby the basin which helps to create awareness and minimize the risk of transmission of infection[21].

Respiratory hygiene and cough etiquette

Respiratory hygiene and cough etiquette mean the measures taken by person to contain the spread of infection to others as like covering mouth and nose with a tissue while coughing and sneezing.

Environment infection control

In open wards, there must be adequate space between each bed to reduce the risk of cross transmission of infection. Aerosol generating procedure must be avoided in "COVID" area.

Personal protective equipment (PPE)

PPE refers to physical barriers, which are used to protect the mucous membranes, airways, skin and clothing from contact with infectious agents. All the healthcare workers should have the proper knowledge of usage and disposal of PPE kits like face masks, goggles, face shields, gloves, gowns, shoe covers, and other additional PPEs. Face masks, eye protection googles, face shieldsare used to protect the mouth, nose and eyes while providing care to patient with respiratory symptom such as sneezing and coughing. N-95 mask should wear by moderate and high-risk personnel to protect the mucous membrane of nose and mouth during direct patient care. Triple layer medical mask also can be used by moderate & low risk personnel. If the mask gets wet or dirty with secretion it must be changed immediately. Goggles & Face shields usually uses when a splash of body fluid is expected. Sterile, clean latex examination gloves & nitrile gloves should be worn when touching blood, body fluid, secretion, excretion, mucous membrane and skin according to risk. Changing of gloves must be done between tasks and procedures on same patient after contact with potentially infectious materials. Gowns should be worn when there is close contact with the patient, materials or equipment that may lead to contamination of body[22]. WHO recommends about the rational usage of PPE kits to overcome the shortage supply while providing direct care to the infected patients. Some policies or strategies should be adopted in hospitals to facilitate the optimal usage and minimize the need of PPE kits like restrict the visitors entry in Corona wards, restrict the entry of healthcare workers in Corona ward if they are not involved in direct care, use the physical barriers to reduce exposure of "COVID-19", one HCW can evaluate others , ensuring the use of PPE should be rationalized and effective[23].

Biomedical waste management

Biomedical waste management (BMW) is any waste produced during the diagnosis, treatment or immunization of human or animal research activities pertaining thereto or in the production or testing of biological or in health camps[24]. The concern regarding the management of biomedical waste is important to prevent risk on public health. Awareness about handlining, transporting and disposal of waste as per the guidelines by Ministry of Environment and Forest, Government of India among healthcare and public is necessary for proper biomedical waste management.

Table 1. Colour coded containers for waste[25]

Colour Coding	Items	Disposal Method
Yellow	Infectious non- plastic, non-sharp	Incineration
Red	Infectious plastic, non-sharp	Autoclave or microwave (recycle)
White Sharp box	Sharp (metal)	Sharp pit
Blue box	Glass, metal implants	Autoclave (recycle)

Minimum paper work with maximum digitalization

The electronic health record helps to manage the big data in healthcare sector and minimise the paper work for safety of healthcare workers. Some technologies like e- health, telemedicine, teleconsultation, m-health and AI (artificial intelligence) are used for diagnosis, accessibility, cloud based digital drug discovery, mining and managing medical data and robotic services help the healthcare workers to minimise the risk of exposure[26].

Conclusion

Healthcare should be cost- effective, efficient, affordable, equitable to everyone. The role of quality management & infection prevention & control practices of hospitals are very important for detection, isolation, treatment and follow up of "COVID-19" patients. Development of healthcare infrastructure, formulation of standard policies including infection prevention and control protocol, mobilizing the human resources, teamwork, leadership, awareness and community participation can provide optimal achieving parameter to combat with deadly virus "COVID-19" which is the biggest challenge for us in today's era. If "This is a time for facts, not fear", if "this is the time for science, not rumours", if this is the time for solidarity, not stigma", then every individual of this universe has to take responsibility to protect and prevent "THE WORLD".

Declarations

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