



Pandemics and Physiotherapy: An overview of the role of the Physiotherapists in restoring functions and quality of life

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ABSTRACT

Pandemic is an epidemic that has become very widespread and affects the entire vicinity, a continent, and the world because of the vulnerable population. Management of pandemic consequence puts a great load on the health-care sector. It demands great manpower from every sector for the smooth run of the daily essential services. Health care workers play a crucial role in delivering health care services during such pandemics. Physiotherapists are the allied health care professionals which provide primary, secondary, and tertiary level of health care services. The report provides a brief idea about the different roles played by physiotherapists for restoring ability and better functioning of an individual and society as a whole during various epidemics and pandemics.



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INTRODUCTION

A pandemic is a new epidemic occurring across the globe. Influenza (H1N1), Middle East Respiratory Syndrome (MERS-CoV), Severe Acute Respiratory Syndrome (SARS), and Coronavirus (COVID-19) are the unique respiratory infections that have caused disease outbreak (Qiu *et al.*, 2017). There may be a global epidemic at any time of the year and the spread, severity, and mortality patterns cannot be identified easily until the disease arises (Jones *et al.*, 2008). Pandemics greatly increase mortal-

ity and morbidity over a wide geographical location and lead to major political, cultural, and social disruption. The consequence of pandemics put a great strain on the system to develop and implement strategies that include improving sanitation; growing depth perception; and promptly clearing away sparks which may lead to pandemics which in turn increases overall investment on the health care system. This can be managed adequately by the high-income countries to some extent but challenging for middle- and low-income countries. To deal with such crises caused by pandemics, the great manpower force required from the healthcare sector to prevent and treat the spread of disease.

Health care workers, including doctors, nurses, technicians, paramedical staff, and physiotherapists (PTs), play a key role in any response to pandemics. Health care workers who are willing to work during the crises are responsible for the coping ability of the health care system with Pandemic (Chokshi *et al.*, 2016). In the 1916 year, when the world witnessed the devastating polio epidemics and First World War, mark the beginning of the physiotherapy profession. The health care structure of India

is divided into primary, secondary, and tertiary levels and physiotherapists are involved in delivering rehabilitation services at every level.

Physiotherapy during a pandemic

A pandemic tends to happen when three conditions are met, i.e. whenever an innovative infectious agent (generally a virus) starts to emerge for which yet no human immunity is there, which can infect people causing serious illness or death, is efficiently and sustainably spread among the human population. Physiotherapists play a significant role in the prevention and management of illness at all stages. Various strategies have been used to control the spread like self-quarantine, social distancing, and the use of protective measures while treating diseased at home. These strategies have somewhere negative effects on social, emotional, and mental health.

1918 influenza outbreak

1918 flu epidemic led to deadly health events and the need for comprehensive public health services which included physiotherapy allied to medicine as a part for the development of welfare and national health services. Physiotherapists reduced the burden in emergency rooms and redirect employees to participate in patient care as per the need of the healthcare system. Physiotherapists, who are specialized in treating musculoskeletal disorders, contributed in the treatment phase to help stabilized patients and return to full function. Physiotherapist incorporates evidence-based practice service delivery and integrates clinical reasoning and critical thinking in clinical decision making, which is also applicable in such a situation.

The 1916 polio epidemic

Poliomyelitis was another epidemic of 1916 attack the central nervous system in 1% of infections, caused temporary or permanent paralysis affecting the children under 5 years of age. Post-polio syndrome is the condition seen in polio survivors after recovery from the initial attack. This results in muscle weakness, pain, muscle atrophy, deformity, and respiratory weakness. Physiotherapy played an important role in management to restore function and quality of life (QOL) to the possible extent. 1928 and 1940, Kenny, an Australian nurse, used moist packs which were hot to relieve pain and muscle spasm. She applied the principle of neuroplasticity for treatment by promoting early activity and the strength of unaffected muscle. This led to the development of physical therapy rehabilitation services ([Jachak et al., 2020](#); [Mehndiratta et al., 2014](#)).

HIV epidemic

Human Immunodeficiency Virus is perceived as a

worldwide pandemic by some authors. On the contrary, the WHO presently uses the term 'global epidemic' to describe HIV. As of 2018, around 37.9 million people are diagnosed with HIV globally. There was around 770,000 AIDS death in 2018. Unsafe sexual practice, the use of intravenous drugs, unsafe blood transfusion, or blood products are the risk factors for HIV. Physiotherapy helped in the management of impairments resulted in the progression of the disease, opportunistic infections, and the aftermath of medication ([Goodwin et al., 2020](#)). The major focus of physiotherapy is to improve functional limitation, psychological disorders, cardiopulmonary endurance, pulmonary function and immune function. Long term goal of physiotherapy management in HIV to improve QOL ([O'Brien et al., 2010](#); [Shah and Naqvi, 2020](#)).

Chikungunya outbreak

Chikungunya fever is the growing disease spread through mosquito *Aedes aegypti* and *Aedes Albopictus* first described during an outbreak in southern Tanzania in 1952. Chikungunya occurs in Africa, Asia, and the Indian subcontinent with a relatively low level of infection till 2000 when there were large outbreaks in other parts islands of the Indian Ocean, Europe, France, a Caribbean island, and America. Acute arrival of pyrexia and pain in the joints are the most usual signs and symptoms and muscle pain, joint swelling, skin eruption are others. Exacerbation of joint pain and stiffness can be present up to 5 years after infection. Physiotherapy can help in alleviating arthralgia pain hence improve overall function and participation. Cold therapy in acute and sub-acute stages, ROM, and strengthening exercises to prevent osteoarthritic changes, balance, and coordination exercise in a neurological condition which is a rare complication ([Sales et al., 2018](#)).

Ebola outbreak

Ebola virus disease (EVD), previously recognized as Ebola hemorrhagic fever, is a serious, often deadly illness, zoonotic infection first discovered in humans in 1976. West African countries are mainly affected by the epidemic. The spread of the virus to humans is from hunting, eating, and any contaminated products of bats. Among the human population, a virus transmitted via direct contact with contaminated human blood, body fluids, tissues, and surfaces and products (e.g. bed sheets, garments) contaminated with these fluids. Prerequisite from a physiotherapy management point of view is to be competent enough to recognize signs and symptoms followed with thorough examination and evaluation. Physiotherapists as health care personnel are involved in infection control planning in hospitals and clinical

settings as recommended by CDC and WHO guidelines. This includes PPE use, contact and droplet precautions, and acute care setting if required. The role of PTs also depends on the progression and severity of the disease. As such, no recommendation is required to start physiotherapy treatment during acute care settings. After acute illness or discharge from the hospital, many patients report the symptoms of musculoskeletal pain, myalgia and arthralgia refer as Post Ebola Syndrome affects the functioning of an individual. Post-Ebola syndrome can be very well managed by the musculoskeletal physiotherapy, thus improving and restoring the functional and physical activity level of an individual. Fatigue is also one of the functions limiting factors to deal with in recovering time (Reece *et al.*, 2017).

Swine Influenza pandemic

Influenza H1N1 was reported for the first time in April 2009 in Mexico. On May 16, 2009, India reported the first case from Hyderabad. Pneumonia was found in severe respiratory illness which further lead to ARDS and Sepsis managed with supports. In such a case, respiratory physiotherapy is indicated for respiratory care. Influenza (H1N1), Middle East Respiratory Syndrome (MERS-CoV), Severe Acute Respiratory Syndrome (SARS), and Coronavirus (COVID-19) are the innovative pulmonary viruses that have led to outbreaks (Domínguez-Cherit *et al.*, 2009). The respiratory symptoms are range from mild to severe respiratory disease, distress requiring critical care. In severe respiratory distress, comes the role of a cardiopulmonary physiotherapist for respiratory care. Physiotherapists involve in Infection control, prevention as mentioned above, and management of respiratory symptoms elaborated further. MERS-CoV infected patients are also shown to have progressively worsened pneumonia and alveolar damage resulted in ARDS. Respiratory care of the patient is the key responsibility of cardiopulmonary physiotherapist in mechanically ventilated patients with serious pneumonia, sepsis, ARDS and septic shock (Das *et al.*, 2015; Jachak *et al.*, 2020; Srivastava *et al.*, 2020).

Role of physiotherapist

In acute care, setting physiotherapists are involved in clinical decision making for appropriate use of the available intervention. For e.g., The procedures which are at risk for contamination should be handle with great attention such as aerosols generating procedures intubation, extubation, tracheostomy procedure, manual ventilation, bronchoscopy, open suctioning, nebulization, etc. The interventions that are used in physiotherapy like forced expira-

tory techniques, airway clearance maneuvers, or any secretion producing devices should be avoided or used as per the IPC guidelines. Administration of oxygen therapy in mildly symptomatic patients and high flow nasal oxygen in hypoxemic respiratory cases. Appropriate use of invasive and noninvasive ventilation, prone positioning, and humidification requires critical thinking and clinical reasoning. Ventilator-associated pneumonia, ICU induced psychosis and critically induced polyneuropathy are some of the complications in critically ill patients where early physiotherapy intervention can prevent or reduce the intensity. Mobilization exercises and rehabilitation are recommended as soon as patients get hemodynamically stable and discharged from the hospital.

CONCLUSION

Physiotherapy plays a very crucial role in keeping society safe during the outbreak of infectious disease by managing the adverse effects due to immobility and respiratory symptoms, reduce the burden on health care system by preventing and improving the functional limitation, involved in physical and mental well-being in case of isolation and self-quarantine, reducing the social and financial impact of pandemics on an individual.

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Conflict of Interest

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