

Adoption of Quality Tools and Techniques towards Effective Implementation of COVID Eradication Programme.

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Abstract - In the COVID – 19 pandemic, the entire global community is facing a major threat and challenge medically, socially, and economically, in the form of dramatic loss of human life, poor public health, risk of falling into extreme poverty and reduction in GDP. Various studies have been carried out by the researchers to mitigate and overcome the pandemic and the results are implemented, but ineffective. In this article, the authors tried to narrow down the existing gap in the effective implementation and coordination of the recovering activities in the health care industry. A Total Quality Management framework which integrates the hospital processes and activities will result in effective implementation of the COVID – 19 eradication process, with zero errors. In addition, the authors present the adoptability of the quality tools and techniques towards the achievement of the quality objectives in the process of COVID – 19 eradication. Adopting quality principles and practices towards designing and implementing a fool proof health care quality management system will result in an effective and complete elimination of the COVID – 19 and its impact.

Key Words: quality tools, covid – 19 pandemic, health care, TQM.

1. INTRODUCTION

The entire global community is facing a major threat and challenge in the form of COVID – 19 - medically, socially, and economically. Various studies have been carried out by the researchers to mitigate and overcome the pandemic and the results are implemented, but ineffective. There exists a gap in the effective implementation and coordination of the recovering activities in the health care industry. A careful investigation and meticulous implementation only can serve as a redressal mechanism to benefit the society at large.

A detailed study of the COVID – 19 invasion and its impact in the past gives a overall purview of the disaster in the health care industry.

Table-1 Table showing the number of COVID cases in the top 10 highly affected countries, as on 25th May 2021.

Name	WHO Region	Cases		Deaths	
		Cumulative	Last 7 days	Cumulative	Last 7 days
Global		167252150	3990655	3467663	82902
United States of America	America	32797873	174653	584700	4232
India	South-East Asia	26948874	1719878	307231	28512
Brazil	America	16083258	455783	449068	13317
France	Europe	5820918	38038	107403	556
Turkey	Europe	5186487	69113	46268	1508
Russian Federation	Europe	5009911	60338	118801	2590
The United Kingdom	Europe	4462542	14558	127721	42
Italy	Europe	4192183	33061	125225	1069
Germany	Europe	3651640	52794	87423	1263
Spain	Europe	3631661	15090	79601	73

2. Impact of COVID-19

The COVID-19 pandemic has made a humongous collision in the lives of mankind. It has intervened in the economic and social well being of humans claiming millions of people to be at the risk of falling into extreme poverty. In addition, it has presented an unprecedented challenge to public health, food systems and labors’ health and safety in the world of work. It has restricted travel and transportation causing a tremendous downfall of economy leading to income loses and no employment. With irregular incomes, about half of the world’s (3.3 billion) global workforce are at risk of losing their livelihood (Joint statement by ILO, FAO, IFAD and WHO). Catering the world, farmers are confronted to work

often in unsafe conditions facing high levels of working poverty, malnutrition and poor health.

According to data released by the Ministry of Consumer Affairs, over 1,550 tonnes of food grains had been damaged in Food Corporation of India (FCI) godowns during the COVID-19-induced lockdown period in April and May, 2020; 1,453 tonnes were damaged in June, 2020; and the months of July and August, 2020 recorded wastage of 41 and 51 tonnes respectively. India has wasted 4.6 million doses so far since the drive to vaccinate the population kicked off in January, according to data shared by the Ministry of Health and Family Welfare (MoHFW) in response to a Right to Information (RTI) query. Another crisis in the form of vaccination had also emerged, as the country opened up its vaccination drive to everyone above 18 years in the time, at which already 400 million were waiting for their second dose. Malawi, a country in south east Africa, burnt 20,000 Astra Zeneca vaccine doses that expired. A mix up of different vaccines to same people had also happened at Siddharth nagar, a district in Uttar Pradesh, which frightened them that the vaccine cocktail would have an adverse impact on them.

Another major complication to list out is disruption in oxygen supply as: 5 COVID-19 patients die at Roorkee hospital; 24 COVID-19 positive patients died at a municipal hospital in Nashik; 13 COVID-19 patients died after oxygen supply was disrupted due to poor pressure in the oxygen tank at the Chengalpattu Government Hospital, to list a few. In addition, any measure taken to deter the spread of the COVID - 19 and save the life of the infected does not have a purposeful impact. The amount spent by the Government in the eradication, spread control, and treatment of the patients have not yielded any desirable outcome.

3. QUALITY TOOLS AND TECHNIQUES IN HEALTH CARE MANAGEMENT SYSTEM

It is evident that, COVID-19 preventive measures are properly planned and poorly implemented. As per the plan, the measures are to yield effective outcomes, but miserably failed due to poor implementation. Adopting Quality principles, tools and techniques may provide significant results, as the flaws in implementation are reduced considerably. Any quality measure taken as a corrective tool to reengineer the bottlenecks in the COVID-19 eradication process will design a foolproof system with high percentage of effectiveness.

In this globalized era, hospitals and related healthcare organizations have been implementing quality, thereby reducing cost and improving efficiency. The rising importance of quality and its management provides a solution framework which is the need of the hour in healthcare systems - the basic interest of all societies. Quality management system is a potential framework to upgrade the public healthcare management, but often overlooked. The stakeholders - doctors, medical and paramedical staff, patients, attendees were very poorly trained in the context of the quality concepts and its fruitful implementation. This leads to major setbacks in the healthcare industry which includes poor hospital inventory management, improper

record keeping, incorrect housekeeping and non-standardized ICU and operation theatre management. Each mislead will have a drastic impact on the health of the patient, in specific and to the society, in general. Healthcare management system tailored with Quality principles will always result in zero defects, which should be its basic purpose. A Total Quality Management framework which integrates the hospital processes and activities - emergency cabin, ambulance services, in-patient room and surroundings, out-patient services, cleanliness and hygiene, visitor control, discharge, insurance and billing, nursing performance, doctors' care and housekeeping results in continuous improvement with lesser flaws and cost reduction.

The seven basic Q-7 tools proposed by the Japanese quality guru Ishikawa facilitate the design, plan, and successful accomplishment of quality improvement objectives in the Healthcare management system during this COVID-19 pandemic. These quality tools and techniques provide the essential platform for COVID-19 eradication process improvement, as it helps to identify the root-cause of the problem and to develop solutions to eliminate the same. An effective COVID-19 eradication management system should use the quality tools and techniques so as to add value to the general public healthcare management.

The initial phase of COVID-19 eradication process using the Q-7 tools commences with framing the structure of it by showing the sequence of actions using the *flowchart* tool. The categorization of the control measures will give a clear objective with integrated understanding of the activities that are to be performed and communicate the relationship between the various steps easily. A complete investigation of the virus eradication process has to be undertaken to draft the activities, steps and procedures using brainstorming session. The ideas generated from the sessions have to be sequenced in a standardized manner and portrayed as a flowchart for easy understanding and interpretation for the stakeholders concerned.

With ideas being generated and sequenced, *Tally sheets* may be used to track the various COVID parameters in the process of eradication that affects the occurrence of casualties. In addition, this quality tool intends to identify where the process misleads. And it becomes very easier to locate the eradication process variability by specifying the type of variation and the frequency of its occurrence. Tally sheets portray the recorded no. of COVID cases affected, home quarantined, treated, recovered, dead etc., region wise, district wise, and state wise. These sheets gives a clear understanding of the number of health care centres availability region wise with the population in that particular area; its vaccination requirement and like.

Histogram, a graphical display of the frequency of the covid cases for simple interpretation and achieving maximum possible process outcome, can provide a basic outlook of the eradication scenario by the projection of maximum cases affected, home quarantined, cured, dead and vaccinated in a particular region, district, and state. By detailed study of the histogram, it becomes easier for the health care management personnel to check for the skewness, double peakedness,

truncated which paves an effective interpretation for better implementation of the eradication process.

Pareto Diagram, devised by an Italian economist, is the opt tool to classify the error activities according to its importance. Based on the total and percentage of the data obtained by the check sheet and histogram, this profound tool is used to diagnose the vital few causes that accounts for dominant trivial effects. The vital few causes may be: poor nursing, non - availability of oxygen, insufficient number of beds, low inventory of medical experts and skilled doctors, poor transport and ambulance facilities, deficient ventilator provisions, inadequate lab and scanning facilities, faulty logistics of medicines, semi-skilled paramedical staff and attendees, etc... which leads to the trivial effect of increasing number of casualties.

Cause and effect diagram, devised by Ishikawa in 1943, a graphical-tabular chart can clearly and concisely present, analyze and relate the potential causes of the COVID-19 problem and its effects. A thorough examination of this fishbone diagram provides a better understanding of the relationship between the major and minor causes for the effected problem of flaws in COVID eradication process and techniques.

The degree of relationship between the major/minor causes identified and the effected problem can be studied using the quality tool – *Scatter Diagram*. This paired analysis better represents the density and direction of the cloud, which indicates how the variables influence each other. This graphical component of regression analysis indicates the strength of relationship between the cause and effect. Scatter diagram can be used as a follow-up tool to Ishikawa diagram to determine whether the defined cause truly has an impact on the selected effect, the quality characteristic. Based on the cluster of clouds, the data patterns may be clearly interpreted as positively correlated, negatively correlated or with no correlation. In addition, by examining the density or the tightness of the clustered points, the strength of relationship can be interpreted.

The COVID eradication process quality can be easily measured using the quality tool – *Shewart Quality Control charts*. Control chart illustrates the dynamic performance of the process, i.e., performance over a period of time, and is drawn based on the series of random samples taken between intervals. The quality characteristic for the various samples is portrayed as a chart with Six sigma as control chart limits. If the sample lies beyond the Six sigma limits, then the process can be identified to be out of control and appropriate corrective action is prescribed to eliminate the cause. By using the Quality Circle charts the sources of variation can be studied and it becomes easier for the disaster management administrative team to eliminate the variations and thereby improving the COVID eradication implementation process stability.

A massive system with inbuilt Quality consciousness throughout can only integrate the virus eradication activities in the most effective way. A continuous improvement in the COVID virus eradication process can be witnessed by applying the principles and practices of quality management.

Adoption of quality tools and techniques in the health care management system results in:

- Increase in the number of recovered COVID patients, district wise, state wise, region wise etc.,
- Increase in the quality of health care operations towards viral treatment and eradication.
- Increase in the level of satisfaction of the society in general, and the patients, in specific.
- Decrease in the error rate or zero error, by proper and timely coordination of quality conscious activities.
- Developing a continuous error prevention programme by constantly searching the problems, trouble shooting for identifying the causes and eliminating them for better solutions.
- Committed, educated and well trained medical and paramedical staff for error prevention, delay time elimination and proper response to patient needs.

4. CONCLUSION

Since health care services are people oriented the prevention and reduction of human errors at all levels are of vital importance. Top priority has to be given to all the activities involved, with high human reliability in addition to the timely attention, so as to achieve 100 percent efficiency. In the new age of health care management system, with modern technology imbibed, service quality plays a major role in providing the hospitality services to satisfy the patients and public, with cost reduction and health assurance. Maintaining strict quality standards, Well defined quality objectives, Advanced technological equipments and instruments, Well inbuilt infrastructure and resources, Properly trained medical and paramedical staff, Proper documentation will pave way for providing an effective mechanism for the best implementation of the COVID eradication process, with world class health care services to the public at affordable cost.

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