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Research Article

Effects of COVID-19 on Various Departments of a Hospital

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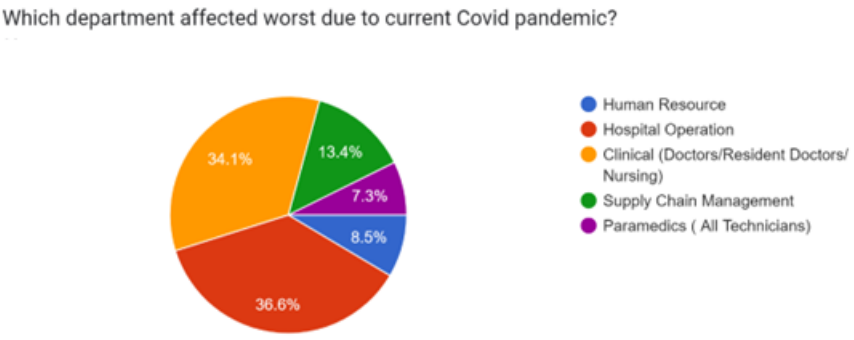
ABSTRACT

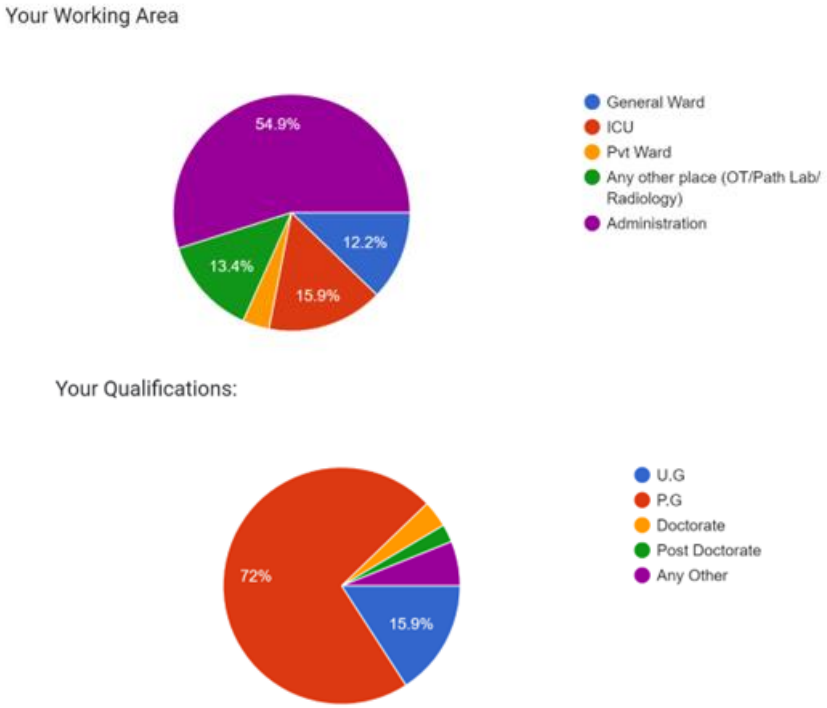
The SARS-CoV-2 virus instigated the COVID-19 pandemic, which significantly impacted health care systems worldwide.[1] It has affected hospital operations significantly, forcing such institutions to rethink their practices and rapidly innovate to absorb extraordinary patients' volumes and demands.[2] This paper attempts to address more wide-ranging implications of the pandemic in a multi-departmental setting, which includes Emergency Services, ICU, General Wards, Outpatient Services, Surgical Departments, Radiology, Mental Health Services, Administrative Units, and Supply Chain Operations.[27] The conclusions are drawn up through analysis of these departments in the research paper will support for conclusions that can be drawn to highlight insights as to how a healthcare system should better prepare for the next pandemics or major health crisis.

Introduction

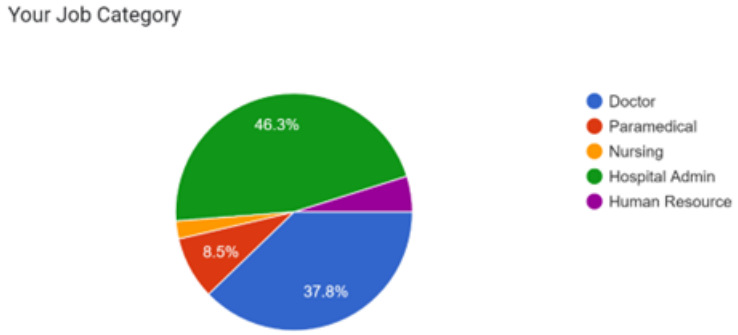
COVID 19 brought severe break down in the international health delivery system.[3] The high infection rate, with increased hospital admissions, thus necessitating higher utilization of the health institutions and requiring swift rearrangement in various departments of the hospitals.[28] Many of their services that were not relationally connected with COVID 19 were curtailed or terminated completely;[4] hospital departments which normally work within a relatively stable environment were suddenly transformed.
This research offers a general idea of how the pandemic affected various departments in a hospital. It looks at immediate responses during the peak of the crisis, short-term modification needed for continuity, and the long-term consequences of the pandemic on the operation and delivery of services in hospitals. The analysis is very informative about which response by department is hardest and relates to the major challenges.
Researcher found in his survey in 324 responses that worst affected department by the Covid 19 was Hospital Operation according to 36.6% respondent, the second worst department was Clinical Department according to 34.1% respondent



Out of 324 respondents 54.9% were from Hospital Administration. Out of these total participants 72% were post graduate



Maximum participants 46.3% were from Hospital Admin department



Impact on Emergency Services

At the core of the entire defence mechanism was the Emergency Department, a frontline, where the initial surge patients were treated along with identification, isolation, and triage of suspected cases of COVID-19. Surge in overnight numbers of critically ill patients put huge pressure on the ED, with several problems arising:

Increased Patient Load

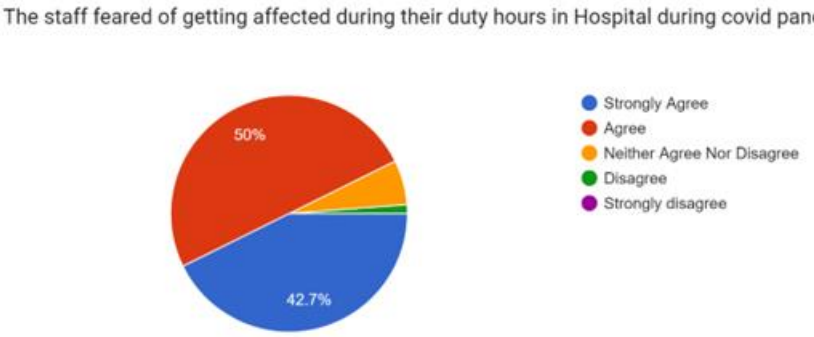
Patients swamped emergency departments early in 2020 with suspected infection of COVID-19.[5] Even in the most severely affected regions, the number of patients exceeded the capacity of most hospitals by 300–400%.[29] Suddenly, emergency departments, which had been at or near capacity for most acute care hospitals, were expected to offer oxygen therapy and mechanical ventilation, as well as other forms of intensive care, to a number of unprecedented patients.[26]

Infection Control Challenges

Infection control was the most demanding for Emergency Department.[6] Since the COVID infection has an extremely high rate of transmissibility, immediately various measures had to be taken by hospitals to keep suspected cases of COVID-19 separated from the non-COVID patients. Such structural demands in Emergency Department became unavoidable to include making secluded zones for patients with COVID and redesigning waiting areas to accommodate social distancing.

Staffing and Burnout

The demands made by such a high workload has negatively impacted the emergency department staff. The frontline workers experienced increased hours of duty and high levels of anxiety and fear, as they constantly risked exposure to COVID-19, thus experiencing noticeable burnout and stress-related problems.[31] Hospitals were forced to adapt temporary staffing upgrades and support services; however, such measures repeatedly failed to better alleviate the physical and mental pressures imposed on frontline workers.



Effects on Intensive Care Units (ICUs)

Perhaps the most glaring part of the affected departments was the ICU, which became the critical battleground in order to treat the most severe cases of COVID-19. The ICU beds were filled with patients requiring ventilation and critical care. This had led to some grave issues:

Surge in ICU Admissions

As the virus became rampant, COVID-19 led to a surge in admissions,[7] which had risen sharply by more than 20% in hospitalized cases needing acute care. The explosion swept through ICUs, with spikes especially in the initial stages of the pandemic when most hospitals were still lacking ventilators, beds, and staff to deal with the critically ill as above.[33]

Ventilator and Equipment Shortages

Vast numbers of patients with COVID-19 needed mechanical ventilation,[8] and thus there's now a global, exploding demand for ventilators. It thus became necessary for many hospitals to take rather serious decisions in the distribution of available resources. In many contexts, this thus implied that ICU staff had to find creative solutions, including even the improvisation of ventilatory support using reconverted anaesthesia machines and non-invasive ventilation devices.[34]

Staffing Issues

The ICU services require specialist and well-trained staff, hence only given to highly trained professionals, whereas the sheer volume of patients resulting from the COVID-19 pandemic placed an enormous strain on these staff members. Many people were deployed came from other departments, but care in the ICU is specialized, so the newly assigned persons do not have the much-needed skills. In some cases, crash courses in ICU care were provided for redeployed staff in hospitals, but that was not an ideal solution.

Impact on General Wards

General hospital wards were converted during the pandemic to meet the demand,[9] with many converted into areas that could treat COVID-19 cases, while some absorbed overflows from the ICU and ED. These changes presented a number of key challenges and forced some important adjustments.

Rearrangement of Wards

General wards had to be rearranged quickly within hospitals in order to set up specific COVID-19 management areas. This included converting general rooms into isolation rooms, equipped with sufficient ventilation and air filtration systems and other arrangements. Otherwise, non-COVID patients were shifted outside the ward to other areas in the same hospital or even outside-which exacerbated problems in managing the patients once again.

Reduction in Non-COVID Services

Most of the hospitals stopped or scaled down their non-COVID-based activities to deploy all available facilities and man-power to treat patients infected with COVID-19.[10] This delay in elective surgeries and non-emergency medical care mostly litters some setbacks on the patients that have chronic conditions, or else those requiring regular treatment. Secondly, it affected the profitability of the majority of the hospitals since most rely on elective procedures for income generation.

Staffing and Workflow Redesign
Similar challenges were experienced at the general ward with respect to understaffing and workflow disruption. The staff here also needed to be trained on new COVID-19 protocols such as PPE usage and infection control measures. Several general ward nurses and doctors were redeployed elsewhere in the hospital to cope with the new demand, thus stretching already thin staffing levels.

Impact on Surgical Departments
The pandemic, therefore, ravaged the surgical departments with the unprecedented reduction in elective surgeries in several hospitals and resorting to emergencies only.[11] This change was to have extreme effects on patients as much as on healthcare providers. It also had a huge impact on hospital finances.

Delay in Elective Surgeries
Orthopaedics, cardiovascular surgeries, or cosmetic surgical procedures were delayed or cancelled.[12] It opened up a long tail of patients waiting to undergo surgery, the condition of many of them deteriorated due to the delay of their surgery. Then hospitals face the challenge of catching up with this backlog with daily cases of COVID-19 as many of elective surgeries become emergency procedures

Changes in Surgical Procedures
For procedures that continued, there have to be strict infection control measures. Surgical staff needed to wear an enhanced PPE, the operating rooms had to be modified so that COVID-19 didn't spread further. It included increasing ventilation and deployment of fewer staff during procedures to maintain the hygiene

Impact on Surgeons and Surgical Staff
Covid has impacted surgeons and surgical staff severely in their regular and financial operations. The impact was more severe in private practice or elective-specialty areas. Many hospital staff were transferred to COVID-19 units and could not conduct surgical activities; the pandemic also exposed a dire need for disaster preparedness in surgical departments.

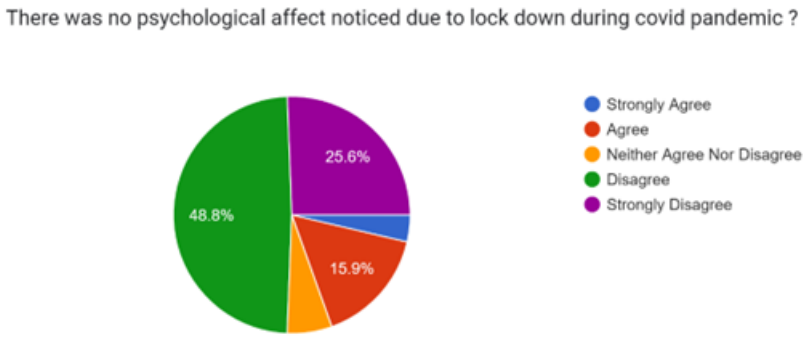
Impact on Radiology Departments
The Radiology department played a very important role in monitoring and diagnosing COVID-19 patients.[13] Chest X-rays and CT scans, particularly, were relied on to view lung damage.[14] Still, the pandemic has introduced several challenges into the report of radiology departments:

Heaving demand for Imaging
Since COVID-19 mainly attacks the lung, the demand for radiology service, especially chest X-rays and CT scans, significantly increased.[15] The confirmation of a diagnosis of COVID-19 depended on imaging as well. This surge only created an added stress of the burden imposed by COVID-19 on the personnel and equipment of the department of radiology.[35]

Infection control measures
Infection prevention measure in radiology departments starts with cleaning the imaging equipment between each use,[16] segregation of COVID-19 patients from the rest of the inpatients. This process has not only compromised some workflow but has also increased personnel to handle increased loads with new protocols.

Delays in Non-Accountable Imaging
Similar to other departments, patients suspected of having contracted COVID-19 were kept in the wards; thus, non-emergency radiology services were either postponed or cancelled. This meant that there were harsh setbacks in diagnosis and treatment for the chronic diseases, such as cancer or cardiovascular diseases, who required routine scans.[32]

Impact on Mental Health Services:
The pandemic makes mental health issues cut across all demographics and saw a noteworthy increase in those seeking psychiatric consultation in hospitals.[17] Additionally the pandemic has visibly affected the mental health of health care providers:



Mental health patients' numbers have increased

The forced isolation, heavy financial burden and trauma imposed by the epidemic, contributed to severe increase in mental health emergencies, ranging from anxiety disorders to depression and substance abuse. Mental health facilities were crowded with patients needing attention in emergency departments and higher inpatient psychiatric treatment.[18]

Challenges in Providing Care

The implementation of social distancing measures and the fear of viral contagion limited the capacity to deliver mental health care.[19] There were many medical facilities which were forced to introduce online services for psychiatric screenings to accommodate the burden

Mental State of Health Care Workers

In general, major and directly involved health care workers in response to COVID-19 had a substantial number of mental health-related challenges.[32] Most of the hospital staff faced burnout, anxiety, depression, and even post-traumatic stress disorder thus leading to higher rates of absenteeism and turnover. Therefore, hospitals set up mental health services for their workforce that involved counselling and peer support.

Effects on Administrative Units

The administrative department, largely working in the background to meet the unexpected demand from all other departments had to face the extreme difficult situation to manage the day-to-day operations throughout the duration of the pandemic. There were new challenges emerged almost every day new while coordinating on how the hospital should handle the situation:

Logistical problems

To the hospital administrators who, were overwhelmed with the responsibility of expanding operations in an emergency had to depend on organization-related activities involved in obtaining personal protective equipment,[20] ventilators, and other necessities. Additionally, the had to focus on shifting individuals and ensuring one adheres to the ever-changing governmental rules and regulations.

Financial Impact:

The finances of the hospitals started getting impacted as elective procedures and non-essential care were put on hold and administrators had to focus on trying to managing budget shortfalls [21] while simultaneously increasing their spending on COVID-19 care, including overtime pay for personnel, increased ICU capacity, and medical supplies.

Adapting to Remote Work

Many of the administrative staff moved to home based or remote working during the pandemic, which meant the hospitals needed to embrace new technologies and communication platforms very quickly.[22] While several of the administrative work could be transferred to remote facilities, others, such as patient intake and billing, required constant physical presence, which made workflow administration quite complicated.

Supply chain operations impact follows

The COVID-19 pandemic exposed serious vulnerabilities in the global healthcare supply chain. All current PPE, ventilators, and various other types of medical supplies suffer from severe shortages:

PPE Shortages

The most significant threat that was faced in this pandemic was the worldwide shortage of PPE, especially masks, gloves, and gowns.[23] This resulted in an inability to provide adequate protective cover-up in the hospital; therefore, institutions regulated the use of PPE and launched such policies as rationing and

reuse.[30] Such a crisis pointed to the necessity of a far more resilient and diversified supply chain for healthcare supplies.

Supply Chain Disruptions

The pandemic caused tremendous disruptions in the global supply chain, which further adversely affected the hospital's access to drugs, medicines, and food.[24] All of this called for collaboration between hospitals and supply chains in formulating contingency measures to ensure the availability of all resources without disruption.

Adaptation and Innovation

Most of the hospitals responded in a very innovative approach, especially with regard to such things as printing medical equipment, like stethoscopes, 3D printing, and liaising with local manufacturers to make PPE.[25] Innovations such as these ensured that there was a reduction in pressure caused by the supply chain and provided lessons for future preparedness.

Conclusion

COVID-19 has silently been experienced by every department in the hospital around the world. This crisis dramatically tested the healthcare system from frontline ED and ICU to the administrative work and supply chain departments. Yet despite many great challenges that faced the hospitals, they still kept bending and adapting within this unprecedented crisis.

Some of the key lessons from the pandemic include surged capacity planning, a more resilient healthcare supply chain, and mental health support both for patients as well as other healthcare professionals. Such lessons are positive results that improved preparation in anticipation of more pandemics or extensive healthcare crises set forth within the healthcare systems.

In this respect, the pandemic has highlighted the interdependence of the departments within the hospitals, and it stressed the need for a cohesive, multi-disciplinary approach in healthcare infrastructure during crisis situations. Increasing these relationships and preparedness will render the hospitals better prepared to safeguard their patients and clinical staff from the impending challenges.

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