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UNDERSTANDING THE NATURE OF HIGH RESPONSIBILITY TEAMS– A CASE STUDY OF EMERGENCY MEDICAL CARE

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ABSTRACT

Organizations have been attempting to influence safety culture at their sites to transform into a High Reliability Organization (HRO). These organizations are technologically sophisticated and more proactive to promote culture of safety. Emergency Medical Care (EMC) is one such HROs, have gained a lot of researcher's attention in the recent times. EMC requires both broad knowledge base and wide range of technical skills. People in EMC are highly trained and they are confronted with uncertainty and fluctuating workload. The ability to provide immediate medical care is fundamental and critical. In this case study we have observed the nature of High Responsibility Teams (HRTs) operating in EMC of a major Cardiovascular Sciences & Research, Bangalore, India. We observed the work flow and operational challenges faced by the HRTs. For this study 7 semi structured interviews were conducted with doctors and nurses who worked together as a team in EMC along with field observation. The data analysis was done using grounded theory based on the ideas of Strauss and Corbin (1990). The analysis showed that the role of teamwork between nurses and doctors is critical to the patient safety. This article concludes how understanding the role of team work is essential and emphasis on the need of team work training in EMC.

INTRODUCTION

In recent years there is an increase of studies emphasizing the control of major hazardous risks, in particular to the philosophies of high reliability organizations, resilience management and safety culture [1]. High Reliability Organizations (HROs) are defined as complex and technologically sophisticated, where in a system failure may result in catastrophe [2, 3]. HROs have the ability to manage unplanned and unexpected events and are more proactive than reactive in error management. HROs promote collaboration with all members of the team, encourages open communication, transparency and provides ongoing training and education to their employees [4].

Roberts and Rousseau (1989) identified eight characteristics of HROs: (1) hyper complexity, (2) tightly coupled, (3) extreme hierarchical differentiation, (4) many decision makers working in complex communication networks, (5) high degree of accountability, (6) frequent, immediate feedback regarding decisions, (7) compressed time factors, and (8) synchronized outcomes [5] Weick and Sutcliffe (2001) offered five principle characteristics of HROs: preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and deference to experience [6].

High Responsibility Teams (HRTs) are occupied in medical, crisis management, and air traffic control teams; they face many challenges during their daily tasks. These challenges include working under time constraints, unexpected events, and severe consequences of errors [7]. The concept of HROs has been around for more than 20 years, but has recently begun to take hold in health care with the publication of *To Err Is Human* and The Agency for Healthcare Research and Quality (AHRQ's) patient safety agenda [8]. As noted by Vincent (2010), the "study of high reliability organizations has encouraged optimism about what can be achieved in health care and pointed to a

much more proactive approach to safety than the more familiar reactive learning from incidents and adverse events" [9]

Emergency medical care (EMC) providers just like aviation crews, work with different partners in a variety of settings. These highly trained individuals routinely are asked to perform together but rarely have formal training in doing [10].

As medical professionals began adapting crew resource management concepts to medical care, quality improvement measures at many hospitals began to merge traditional quality assurance (statistical measures of performance) and risk management (damage control) efforts toward a more proactive model [10]. This clearly indicates the principles of HRO have been identified in the field of medical care especially with respect to emergency and trauma care. Experts from medical and health care systems now understand the need of team work in achieving error free performance. Therefore there is a pressing need for research to provide a more nuanced, contingency framework, to help organizations to identify HRTs practices that fit their particular situation. Hence the present case study aims to understand the nature of team work in EMC. By understanding the role team work among the members of EMC will further help to develop suitable training and intervention program to enhance the performance of the team in future.

METHODOLOGY

(a) Choice of Method:- Based on the research objective and question in this study a qualitative approach was adopted. Moreover, due to the lack of previous research in understanding the teamwork on this topic, it was decided to use grounded theory as the specific qualitative approach, and semistructuredinterviews were selected for data gathering.

(b) Qualitative research interview:- A semi-structured interview is also known as qualitative research interview. By choosing this method there was room for the interviewee to steer the interview into the direction of his or her interpretation of the topic. This technique is commonly used in qualitative studies [11].

(c) Methodological approach: We used grounded theory approach**.** The process of grounded theory is more circular than linear, and it uses both deductive and inductive thinking to let the theory emerge from the naked data (Strauss & Corbin, 1990) [12]. We followed the interpretation of Strauss and Corbin of grounded theory and used their guidelines to analyse and treat the data material.

This study set out to develop a better understanding of the nature of team work among EMC and therefore this study was designed as a case study to understand the contemporary phenomenon with in real-life context and we learnt the fact that the boundaries between phenomenon and context are not clearly evident in HRTs and in real life situation too. A case study is an analysis of a single unit (e.g., a person, group, process, or object) focusing on the developmental factors of that unit in relation to the context [12].

The interviewees were selected after observing workflow and respobilities carried by each members of EMC. In order to confirm their statements more than one interviewee was selected across different shifts in the same hosptial. Further they were asked to participate in an interview on avialiability of the interviewee at workplace, as the interviewee was difficult to respond due to the busy work schedule. The study included interviews with 7 interviewees (1 Chief Medical Officer, 3 Duty Doctors and 3 Nurses)

(d) Conducting the interviews

The interview guide was constructed with the help of supervisor (Annexure – 1). The interviews were conducted in Kannada or English (depending on the preference of the interviewee) at the Department of Emergency, Jayadeva hospital, Bangalore. The interviews were recorded with an audio-recorder. The participant was notified before the start of the interview about the use of the recorder and consent was taken. The interview guide was used to ensure main topics were reflected, even when an interviewee deviated from the topic with an interesting thought, this was further explored. This allowed for insights to develop, which would not have been possible in a non-semi-structured interview [13].

(e) Data material and analysis

After the interviews data were transcribed, and the transcriptions were checked to ensure that no data was left out or wrongly noted. The coding and analysing techniques used in this study were developed based on the Strauss and Corbin's (1990) interpretation of grounded theory. After all interviews had been coded, they were further analysed and sorted into categories.These categories were formed using the guiding question of what the codes had in common. Based on a combination of inductive and deductive thinking these categories were reassessed and categorised on a higher, more abstract level

DISCUSSION

(i) Context: The Cardiovascular Sciences & Research is a Government owned Autonomous Institute and is offering super specialty treatment to all Cardiac patients. It has got 600 bed strength with State of Art equipment in the form of 5 Cathlabs, 7 Operation Theatres, Non-Invasive Laboratories and 24 hours ICU facilities. Presently on an average 800-1000 patients are visiting this hospital every day and annually 25,500. In patients are treated. About 3000 Open Heart Surgeries, 10500 Coronary Angiograms, 4000 Procedures including Angioplasties and Valvuloplasties are done in this hospital [14].

The emergency department on an average attends 80 – 100 emergency cases less than 24 hours, the nature type and number of these cases is not predetermined, though as cardiac speciality hospital, emergency department are accustomed to receive other wider range of cases from trauma, causality, suicide, food poisoning to death cases [14].

(ii) Work flow

The above figure depicts the workflow of the emergency department (ED), the work flow map was developed with help of ED Team, the ED team comprises of Duty cardiologist, Chief Medical Officer, Duty Doctors, Nurses, ECG Technician, Lab technician, Ward attenders, Receptionist and Ambulance Driver. There are three different timings working shifts from Morning 8 AM to 2 PM, then 2 PM to 8 PM and from night 8 PM to 8 AM. The following table 1 shows the number of team members allocated in the ED at different shifts.

In the observed work flow of ED teams constitutes of four major stages. The work flow of ED team is considered when the patient arrives to ED as Input till the patient departures from ED either by admission to hospital or other hospital or death. The four stages are depicted in the figure 1& 2 below.

ii. (a) Patient Arrival

The ED is situated at the basement of the hospital, as the soon the ambulance arrives the security personnel at the gate will inform the ward attenders to get ready with the trolley. The need for the trolley is based upon which the patient arrived in different vehicles, if the patient arrives in private vehicles ward attenders need to attend patient with available trolleys which are kept ready in the side of the basement. On the other hand majority of the fatal cases arrives in ambulance, ward attenders are accustomed to take the patients from the ambulance's trolley itself. There are situation which more than two fatal cases arrives at a times which makes situation more complex where patients attenders will drive trolleys till ED.

There certain incidents which we observed the conflict between the attenders of the hospital and other ambulance attenders of other institutions on issue of trolleys, attending patients and the unavailability of ward attenders itself at crucial times. The Figure 3 & 4 Shows the ambulance arrival at the gate and standby trolleys for emergency care.

ii. (b) Initial Assessment

As the patient arrives to ED, the first and foremost requirement is Initial assessment. ECG will be assessed first to classify the severity of the case and rule out the cardiac cases from other general complaints. The ECG usually will be taken by an ECG technician, the tool is kept in wheels as it can be mobilised towards the patient freely in the department, sometimes nurses need to carry out ECG in the absence of technician during night. The nurses will guide patient attendees to file Out Patient File from the reception counter. After the ECG valuation, duty doctor will be reported with the obtained results, meanwhile duty nurse are engaged to assess the vital parameters and follow the treatment as per guidance given by duty doctors.

ii (c) Prioritization Zone

During the initial assessment a Tragic and Initial Assessment form will be filled by the nurses, this is where the nurse will try to understand the degree of severity in the case. This is known as *prioritization zone as* shown in the figure *5*. Meanwhile a degree of understanding is expected from doctors and nurses to understand the severity of cases, hence colour codes are derived based on each cases

ii (d) Case history collection & Diagnosis

The collection of case history at brief will be carried out by the duty nurse at the initial assessment. After the stabilising the patient's vital parameters, duty doctors engage in diagnosing the patients by taking the case history of the patient in depth. The decision for further treatment of the patient in general is taken by the doctor itself, except with the unique cases like multiple organ failures is a challenge as the hospital itself is specialized only for cardiac treatment. During diagnosis doctor will take decision on clear cut cases, which is based on their work experiences.

There are certain cases which are complex in nature and difficult to rule out the diagnosis; those cases are brought attention to the head of the unit of that particular day. The main objective of the duty doctor is to treat patient first, if the patient is critical immediate decision will be taken for the admission of the patient. The doctor need to assist nurses during treatment period, doctor will give the necessary operational guidelines to the duty nurses in handling each cases. These guidelines are case sensitive and unique to each case.

ii (e) Decision to Admit vs Discharge

The chief medical officer is the person in responsibility to take decision regarding the admission of the patients, during decision making he has to keep informed to unit head chief and check the availability of the bed in respective units. Most of times duty doctors who are also be an essential part of decision making as they represent the unit head on that particular day. During severe or near death cases either duty doctor or chief medical doctor take immediate decision and will not wait for any feedback from higher authorities as their main goal is survive the life of the patients. They immediately forward the patient to ICU for further diagnosis. There are other general cases which is reported along with cardiac cases, like suicide, trauma cases and other physiological aliments other than heart, the doctors need to guide them to

other hospital as this institute is specialised in cardiac care only.

(iii) Operational challenges

Further from the interview and observations from field, we listed out the operational challenges faced by CMO, Duty Medical Officer and Nurses in EMC. These challenges reflect how members of EMC communicate to share each problem and solve to arrive at a plan. The plan often involves tasks, and the team shares the workload necessary to complete the task work.

iii (a). The Operational Challenges reported by Duty Medical Officer

- Making to understand the patients about the non-speciality versus speciality cases.
- To convince patients to go to other general hospitals.
- To handle the death cases – The legal and medical issues in declaring death on arrival
- In case of multiple organ failure, prioritizing the heart with other organs is difficult and taking opinion from other experts with respect to multiple organ failure will delay the decision making at crucial times.
- Need to handle the instructions and different opinions of senior colleagues.
- Collaboration with Intensive Care Unit (ICU) department for the availability of the bed.

iii (b). The Operational Challenges reported by Duty Doctors (PG students)

- Communication problem with PG students, language barrier with local language
- Need duty nurse to assistance most of the time to help with the translation
- Difficult to make understand the patient and their relatives about the non- speciality versus speciality cases.

iii (c). The Operational Challenges reported by Duty Nurses

- ICU staff co-ordination problem during the admission of the patients
- During high peak it is difficult to have proper communication with patient attendees, which may lead to conflict
- Assist PG doctors with language translation
- Majority of communication with patients and relatives are all handled by nurse.

During the operational tasks carried out by the members of EMC, we observed the prevalence traditional hierarchy during routine period involving initial assessment, vital assessment and case history. The traditional structure is derived from the present case study on the observations of workflow pattern, were nurse attends the patient first for initial and vital assessment, followed ECG technician to carry out ECG, then the resident or duty doctor collects the case history and further treatment plan is advocated by the CMO. But during critical or high peak hours of ED (for ex; when more two emergency cases reported back to back) we have observed a gradual dissolving in the traditional hierarchy structure and task was carried out by prioritizing the safety of patient first and workload is divided based on the degree and severity of emergency cases.

Based on these observations form the work flow and the operational challenges, we observed a set of categories which govern the nature of team work in EMC. (a) **Complexity**: - Teams operate in higher degree of complexity, especially when we look at the challenges faced by the doctors and nurses. The complexity is contingent upon the multiple informational cues, number of steps and environment conditions. (b) **Responsibility & (c) Accountability**:- Responsibility is the ability of the team to perform as required in the function or position under stated conditions for the required period of time and accountability is team begin answerable to one's superior for the exercise of one's authority and the performance of one's duties in the given function or position. (d) **Effective Communication: -** The team's ability to plan and work together, teams must communicate. Regardless of how brief, communication to share a "mental model" of the situation and create a plan for solving the challenges posed is essential to team performance. **Dynamic Work Environment: -** The nature of actions and task carried out by the team is highly dependent on time and environment**.** The uncertainty with the nature of medical cases, timely availability of critical information and extent of interdependency between uncertainty and environment are unpredictable by the doctors. Hence they operate under highly constrained systems where the actions of the agent (doctor or nurse) and time is highly interdependent, because sometimes rate of emergency cases are high or low, the extent and severity of emergency cases are unknown (multiple organ failure) and the availability of time to react is very less.

The above observed sub categories among the members of EMC are the characteristics of HROs that dictate teamwork as an essential component of such organizations. HROs will not achieve high reliability unless its members are able to effectively and efficiently coordinate their activities [10]. Hence team work training under these lenses is very essential for the member in EMC. The challenges faced the EMC teams are basically grounded due to lack of effective communication, co-ordination, task simplification and prioritization at different levels.

LIMITATION AND FUTURE DIRECTIONS

This study similar to all case studies has limitations. Indeed many scholars have tried to understand the nature of team work from its antecedents like output,

quality and other performance indicators. But in our case study we only focused the on workflow and challenges of EMC teams. Future research could also focus on how members in team contribute towards achieving reliability. Similarly we can see the future research to what extent team members operate focusing on the processes of the team in achieving high reliability and accountability.

Table 1. Showing team members of ED

Team members	Morning Shift	Night Shift	Evening shift
Duty Cardiologist	1	1	1
Duty Medical Officer / Doctor	2	3	2
Staff Nurse	2	3	2
ECG Technician	1	-	1
Ward Attenders	1	1	1

Figure 1. Showing the Workflow of the ED at Jayadeva Hospital

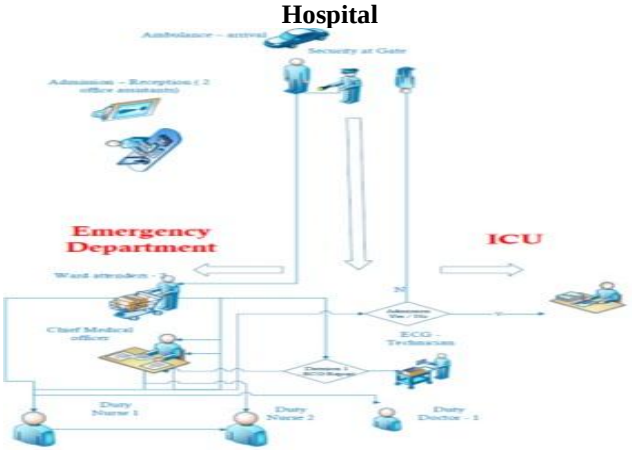

Figure 2. Showing the observed stages in workflow of ED

Figure 3. Gate of ED

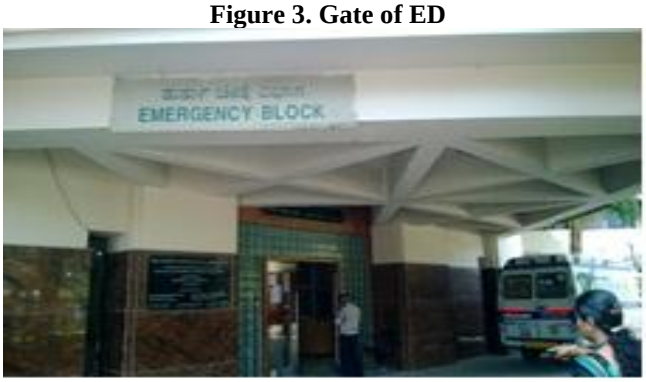

Figure 4. Showing the standby trolleys

Figure 5. Showing the colour codes used to classify the cases.

CONCLUSION

The present we focused on two basic themes. First, Work flow, by its nature, requires that organizations providing such services act as HROs and second challenges faced by EMC, as patients today expect error-free care [15].

From the case study it reveals that teamwork is an essential component of HROs. (A) Complexity (B) Responsibility (C) Accountability (D) Effective Communication and (E) Dynamic Work Environment are the governing themes in understanding the nature of HRTs in EMC. Although it is not the sole determinant of high reliability, HROs are comprised of teams embedded in multi-team systems and effective teamwork is critical in environments that demand high reliability for success [16].

Hence the best way of improving teamwork is through training and identifying the training needs.

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