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Communication

Organizational Learning in Health Care Organizations

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Abstract: The process of collective education in an organization that has the capacity to impact an organization's operations, performance and outcomes is called organizational learning. In health care organizations, patient care is provided through one or more visible and invisible teams. These teams are composed of experts and novices from diverse backgrounds working together to provide coordinated care. The number of teams involved in providing care and the possibility of breakdowns in communication and coordinated care increases in direct proportion to sophisticated technology and treatment strategies of complex disease processes. Safe patient care is facilitated by individual professional learning; inter-professional team learning and system based organizational learning, which encompass modified context specific learning by multiple teams and team members in a health care organization. Organizational learning in health care systems is central to managing the learning requirements in complex interconnected dynamic systems where all have to know common background knowledge along with shared meta-knowledge of roles and responsibilities to execute their assigned functions, communicate and transfer the flow of pertinent information and collectively provide safe patient care. Organizational learning in health care is not a onetime intervention, but a continuing organizational phenomenon that occurs through formal and informal learning which has reciprocal association with organizational change. As such, organizational changes elicit organizational learning and organizational learning implements new knowledge and practices to create organizational changes.

Keywords: organizational learning; system based learning; healthcare organizations; knowledge management

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1. Introduction

"A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health" according to the World Health Organization WHO [1]. Health care systems vary by country and are financed by varying compositions of public and private sector funding. Health care organizations such as hospitals and academic health centers (university affiliated teaching hospitals) form a major component of a healthcare system, regardless of the country or funding arrangements.

Healthcare organizations are composed of health care professionals from multiple disciplines forming several interconnected care teams that strive to provide safe and consistent care [2]. The care teams have to coordinate and communicate amongst their team members and with other teams to function in a cohesive manner to execute the highly coordinated and high risk activity that is called patient care. Health care organizations have to be able to modify their activities based on sudden changes in the condition of their patients or sudden demands due to public health disasters such as pandemics (Severe Acute Respiratory Syndrome, 2002–2003), without compromising patient safety or quality of care. New knowledge creation, technology advances and other market changes can add new and unexpected demands in health care delivery. Health care organizations have to maintain stability following institutional protocols but have to assess their performance and evaluate protocols to create and incorporate new knowledge.

Organizational learning is described in several ways. It is said to be the cumulative product of the learning of small groups or teams [3]; and the collective learning that occurs in an organization that has the capacity to impact an organization's performance [4,5]. It is also described as a process of increasing organizational effectiveness and efficiency through shared knowledge and understanding [6], which is a system-level phenomenon that stays in the organization regardless of the changes in health care teams or team members [2,7].

Organizational learning can be viewed as a modified context specific learning by multiple teams and team members to translate knowledge to action and to evaluate those actions to create shared knowledge within an organization/institution. Individual and team learning complement organizational learning but do not produce organizational learning because these learnings often occurs in professional or team silos without knowledge sharing with other groups within an organization. Organizational learning can occur either as a result of organizational change or as a precursor to organizational change and has been explained by change or system's theories and knowledge management theories respectively.

Peter Senge, introduced the term "learning organization" a scenario in which people are continuously learning together for the best possible outcomes from the organization [8]. A successful learning organization in Senge's system's theory has the capacity to change and manage change where individuals in an organization adopt system thinking, attain personal mastery, share mental models,

have a shared vision and learn in teams [7] Nonaka and Takeuchi proposed a model of organizational learning as the process of knowledge management where they discuss the knowledge spiral in which tacit knowledge of an individual becomes explicit knowledge through a process of socialization and externalization which is in turn disseminated through the organization which promotes the organization to learn [9].

The importance of organizational learning in health care systems is to provide the framework for complex interconnected dynamic systems where all operational units have to learn and execute their assigned functions to collectively improve safe patient care. Policies and procedures are developed in healthcare organizations to reduce errors and improve patient safety. Regulated health professional are expected to engage in continuing education to maintain and update knowledge and skills to provide safe patient healthcare as continuing education of health care professionals has shown to be related to improved patient outcomes [10]. Conversely, there is no explicit mandate to engage in continuing education for the support or administrative staff in healthcare institutions although many organizations provide and expect ongoing professional development to improve efficiency at an individual level or local level. Organizational learning forms the backdrop to weaving these diverse groups and mandates into a cohesive platform to advance patient care.

The delivery of quality patient care and patient safety is dependent on the healthcare system in which care is provided. For example, administrative staff such as registration clerks are crucial for timely registration before patient care is initiated. Patient service aids or housekeeping staff are responsible for cleaning patient rooms after discharge or transfer or the operation room after surgery, to get the rooms ready for the next patient. Stores and transport system staff are crucial for logistics of equipment, dressings, linen and several other items. As such, any improvements in efficiency have to include participation and learning among clinical, nonclinical and administrative staff who work within a system. A study examining a systems approach where multiple, multilevel clinical and administrative staff were involved in redesigning processes and roles has been shown to increase organizational capacity and efficiency in hospitals [11]. Identifying and including all diverse groups involved in the delivery of services in reducing waste and improving efficiency of the system using the "Lean methodology" been shown to increase efficiency and safety in healthcare institutions [12].

2. Teams within a Health Care Organization

Teams within a health care organization are not generally consistent in scale or membership. They can be homogenous and heterogeneous teams. Heterogeneity exits within what may be called a homogenous team such as a team of surgeons, where it may not be possible to replace one member with another, as training level, specialty and sub-specialties may vary. These teams can be visible teams that provide frontline patient care such as physicians and nurses or ancillary care teams such as phlebotomists, laboratory technicians, radiographers and radiologists or frontline nonclinical teams such as security, registration and information clerks, patient service aids, housekeeping, or invisible teams such as the biomedical engineering, information technology, kitchen staff or the plant operation team. These interconnections and interdependence are not apparent or appreciated in the large scope of daily activities. For example if the tube system that transport specimens and medications or the information technology (IT) systems that manages all the computers, telephone and paging systems in

the hospital breakdown, there is a disruption and loss of communication, compromising standard care in a timely manner by frontline workers. As such the smooth functioning of a health care organization is dependent on multiple diverse teams learning and working towards a shared goal. There are several reports on improvements in the quality of healthcare and patient safety when inter-professional and team based learning have been implemented [13,14].

Health care organizations' central role is to provide safe and effective health care. They are equally charged with generating new knowledge and approaches to complex issues while educating future generations of health professionals. However, all healthcare institutions recognize that learning as an organization, is an essential function in complex organizations to manage and make system changes, Individual and team learning alone cannot produce the desired effect nor stave off stagnation which could threaten service excellence and patient safety. Individuals and teams in an organization do not learn the same thing at the same time. Information, knowledge transfer, experiences and processes are chosen and adapted to fit their own working environment to complete their task at hand [15]. Organizational learning occurs as the teams learn and execute a series of processes to produce the desired outcome and evaluate their outcomes to make changes in their processes and procedures.

This paper will describe organizational learning in health care in two contexts; the first as reaction to change or as a precursor to change, the second discussing the facilitators and barriers that influence organizational learning

3. Organizational Change Leading to Organizational Learning (Change Management)

Organizational learning is linked to organizational changes and its management of the change process [16]. Organizational change and restructuring due to economic and political reasons is becoming more common in many countries. In a recent survey, 88% of the 263 American hospitals that were surveyed, were engaged in restructuring changes to improve cost efficiencies, quality, or both [17]. This study showed that a "stronger orientation to learning and innovation had a statistically significant and positive relationship with the ability to sustain the restructuring changes and that a control orientation decreased organizational consensus on the perception of improved costs, but did increase perceptions of organizational ability to sustain the effort". Some of the factors identified as control in the study included "the importance to follow existing rules, avoiding risk, and using budgets to motivate employees". The authors caution that the usual habit of health care organizations to become more control oriented during times of change is not beneficial as it may create ineffective change [17].

Health care organizations have to be dynamic to accommodate changes to their system and service delivery models due to changing demands brought on by several factors but not limited to globalization, migration trends, travel and changing socio-cultural landscape of urban and rural areas. For example the patient populations in several urban centers have changed requiring an increased use of translators to service the multicultural group. Translators need to communicate in a culturally sensitive manner and ascertain the breadth and variety of potential disease exposures endemic to the patient's home country. Healthcare staffs, through the interpreters, need to accurately convey the nuances of these interactions and find the right terms.

Similarly, if a change to improve ambulance wait times in emergency rooms (ER) is mandated, the whole organization has to learn and change its practices to make this happen. For example discharge

delays can affect schedules for next day surgeries as bed availability for post operative care is compromised, which in turn results in either delaying or cancelling the surgery. The ripple effect of in-patient discharge delays also impacts ER bed availability as acute care beds are blocked by admitted patients. ER services are delayed and wait times are increased. Increased ER wait times and ER bed scarcity places a strain on emergency medical services (EMS) who need to re-route ambulances to other hospitals. As ER wait times increase, government funding may be withheld as in Canada or hospital may be fined as in the United Kingdom (UK) which impacts the financial health of the institution. The chain reaction of seemingly minor delays caused by late discharges affects the various internal and external arms of the health care system. Targeted quality improvement initiatives such as discharge planning schedules are prime candidates for organizational learning.

Adverse critical events such as privacy breaches or medical errors are some of the most unfortunate yet powerful reasons for health care organizations to reevaluate their practices and engage in organizational learning. The tragic death of Betsy Lehman from chemotherapy overdoses at The Dana Faber Cancer Institute, in Boston sent shock waves, across the institution, oncology community, and the public in 1995. The system changes that occurred at Dana-Faber Cancer Institute following this critical incident and the ongoing organizational learning to improve safe care were reflected in a 10-year report which shows the evolution of systems thinking and safety as a system property in a healthcare organization [6].

Learning from failures does not happen routinely in health care organizations and is hindered by pervasive barriers such as a lack of psychological safety and a culture of blame [3]. Leadership that accepts that failures are bound to happen, proactively develops context-specific strategies to prevent them and promote a culture of safety for admitting and reporting errors, facilitates organizational learning and consequently patient safety [18].

At times, systems changes can be the result of public efforts; for example the acknowledgement of the harmful effects of sleep deprivation on physicians' performance and shortening of duty hours in residency training in North America were due to a distraught father's relentless campaign following the death of his daughter from a drug prescription error [19].

Organizational change in health care does not happen in isolation; routine work is expected to continue during the change process. Iterative design methodology requires repeated testing and refinements which can affect performance [3]. To confound matters, disruptive innovations such as, robotic surgery, telemedicine, self monitoring and self management of chronic conditions such as diabetes, the use of ultrasound by non radiologists, reading glasses in retail stores, medical tourism and retail medical clinics are changing how health care is accessed by the public and delivered by the system. Many inpatient procedures are delivered in outpatient settings now and the need for hospital care is decreasing while home care needs are increasing. Health care organizations have to learn and change with these new innovations to survive the market changes [18].

4. Organizational Learning Leading to Organizational Changes (Knowledge Management)

Another approach to organizational learning associates the organizations' ability to actively create and use knowledge with outcomes [16]. Knowledge management is an important aspect of learning in health care organizations; as new discoveries and knowledge become available professionals in their

respective fields will have to acquire, transmit, retain and use that knowledge. For example, until the mid 1990's surgery was the standard treatment for severe peptic ulcer disease. Organizational policies and procedures were in place to ensure patient safety for these surgeries. Surgeons practiced and perfected their skills to reduce operative complication and the rest of the team followed policies and procedures to ensure patient safety. The discovery that Helicobacter pylori infection is the cause of peptic ulcer disease by two Australian physicians changed the management for peptic ulcer disease from surgery to antibiotic therapy [20]. As such, peptic ulcer diseases became the responsibility of general practitioners and gastroenterologists with surgical teams being consulted only on rare occasions.

There is often a lag time between knowledge creation and knowledge translation in health care. The guideline movement and knowledge translation aspect of research in health care is intended to provide patients with the best evidence-based care in a timely manner. What is perceived as best patient care may change temporally and challenging the status quo and exploring alternate ways should be encouraged to provide the best possible patient care. In this example, it took almost a decade for basic research plus knowledge translation to intersect to drive a change in peptic ulcer disease treatment from cutting the vagus nerve to treating with antibiotics [21].

Institutional policies and protocols based on guidelines are expected to standardize routines, reduce errors and provide consistent care. However, health care organizations should be careful about strict adherence to policies and procedures as it will not promote new thinking and delay innovative discoveries and their use as illustrated by the following interview with Barry Marshall, who discovered Helicobacter pylori and was the winner of the Nobel prize for medicine in 1998.

"The courage to experiment"

"You're Australian, and you were working against a pretty strong North American medical group. Did that play into it?"

Barry Marshall: "Yes, and no. If I'd discovered the initial findings in the United States, I might have just discounted them. There's a very structured and very conventional gastroenterology program in the United States. If your head's just full of that conventional learning (50% of which is incorrect), it's very difficult to get a new concept in" [22].

5. Organizational Memory

Organizational learning also encompasses old knowledge and institutional memory that is held within organizations of how things were done and what the consequences were. The level of expertise and experience of nursing staff in a hospital, determines the infrastructure, functioning and learning as an organization [19]. Healthcare organizations have institutional memory which has traditionally been held by nurses and passed on verbally. Some of the practical knowledge from the nursing pool was compiled into institutional policies and procedures which were updated, modified or changed as needed. Nursing shortages seem to be a global phenomenon and shortage can lead to overwork, burn out and high turnover [12,23]. Burn out and high turnovers can negatively impact organizational learning as tacit knowledge transfer and institutional memory are compromised. As such, organizational learning has to be actively encouraged to share tacit knowledge and maintain institutional memory [24].

6. The Process of Organizational Learning

A qualitative study examined the process of organizational learning in primary health care innovation in two Canadian provinces studying how health care managers, physicians and other health professionals work and share knowledge. The authors conducted 170 interviews over 3 years and examined documents associated with each of the sites involved in primary health care innovation projects [15].

The authors found that organizations that were able to choose and adapt existing knowledge, experiences and processes (bricolage) to solve the problem at hand; implement supportive mechanism and create the "right kind of space" for learning; strengthen learning through experimenting; manage the rivalry between medical professionalism and management; and balance power differences by the local leaders were successful in facilitating both organizational learning and the spread new ideas on providing primary health care services [15]. The authors caution that "organizational learning takes time; patience and persistence are essential. Setbacks and challenges are inevitable, and finding ways to cope with them is an important factor in overall success" [15].

7. Leadership in Organizational Learning

Senior management and formal leaders such as "Chief Executive officers, Presidents, and Chiefs of Staff", sets the tone for institutional learning but middle management (line managers), such as divisional chiefs and unit leaders play a more important role in encouraging and supporting practical experiments and ensuring psychological safety to acknowledge and rectify individual and system issues [6].

Innovation in health care can often come from frontline workers and other informal leaders. Sister Ward a frontline worker observed that sunshine decreased neonatal jaundice. She shared this observation with Doctors R. H. Dobbs the consultant paediatrician and Cremer, the paediatric registrar, during a ward round [25]. This observation and other incidents where blood samples kept in the sunlight had reduced levels of bilirubin (the cause of neonatal jaundice) led to collaboration with the biochemist Mr. Perryman and his team, where they scientifically studied the effects of sunlight on serum bilirubin and developed the phototherapy lamps, which in turn revolutionized medical care of neonatal jaundice world-wide [26].

A second example from Bellevue hospital (New York City) illustrates a similar learning opportunity. Bellvue had strict protocols for treating infants with exchange transfusions if the total serum bilirubin levels (TSB) were above 25 and basing exchange transfusions on a test called salicylate displacement tests at lower levels, illustrates the role of informal leaders in system changes [27].

A child treated in the Bellevue NICU (Neonatal Intensive Care Unit) had an extremely high TSB (total serum bilirubin) (well over 20) but "ample sites" by salicylate displacement. As per protocol, he was not treated. The infant soon developed seizure like activity, an early manifestation of kernicterus. After this, the six senior residents decided to change protocol unofficially; for any TSB > 20, they would perform exchange transfusion regardless of salicylate binding results. To appease the NICU mandate, they continued to perform exchange transfusions in cases of low TSB but saturated albumin sites. In time, quality assurance tests revealed the poor reproducibility of salicylate displacement. Bellevue stopped doing the test but for years remained partial to exchange transfusion over phototherapy [27].

These six senior residents (postgraduate trainee physicians) were the informal leaders who evaluated their practice of performing exchange transfusions basing their decisions on the results of salicylate binding sites, a test of insignificant value, which resulted in a bad outcome for a baby. They were able to persuade their colleagues to follow their unofficial protocol to prevent another tragic outcome, until quality assurance studies found the test unreliable.

Informal network leaders are the community builders who weave organizations together. With little or no formal position or authority, they turn this weakness into strength by demonstrating commitment when they act from personal conviction [2,28]. These informal leaders can be bedside nurses, social workers in an inpatient ward, senior residents, attending staff physicians or any other healthcare professional with a passion to make a change to improve patient care. They have to be able to convince and create a team to address the cause, assign responsibilities and accountability, make the changes and evaluate outcomes to foster organizational learning [29]. It is important that senior management ensures that line managers do not stifle these informal leaders by their rigid adherence to what they consider unbreakable rules and priority projects.

Local unofficial leaders are also called opinion leaders or educational influentials in medical education literature. A systematic review of 18 studies involving close to 300 hospitals and over 300 primary care practices showed that the use of "opinion leaders alone or in combination with other interventions may successfully promote evidence-based practice; effectiveness of the interventions varied both within and between studies" [24]. Informal leaders and opinion leaders are important to promote, sustain and evaluate organizational learning within each group of professionals or teams. For example, to sustain a hand hygiene guideline implementation aimed at reducing spread of infection in a hospital, informal local leadership will be needed at each and every department, division, unit, ward, clinical and nonclinical area, to promote, monitor and evaluate the initiative. The success of the initiative depends on it being a system wide practice so that hand hygiene is observed even in a non-patient care area such as the hospital library. If a librarian touched a door knob on her way to work and does not practice hand hygiene in the library, she can spread the infection through other clinical staff who frequent the library.

8. Conclusion

Health care professionals have the responsibility to look after the interests of their patients, the public, the profession and the organization in that order. As healthcare systems respect and advocate this hierarchy of accountability, patient safety and quality care becomes part of the system. Organizational learning in health care should focus on understanding how it was done, perfecting how it is done and exploring how it can be done to optimize patient care without compromising patient safety.

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Author Contributions

Savithiri Ratnapalan was responsible for the conception, design, drafting the article, revising it critically and final approval of the version to be published. Elizabeth Uleryk was responsible for the design, revising it critically and final approval of the version to be published.

Conflicts of Interest

The authors declare no conflict of interest.

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