Investigating the Effect of Clinical Governess Approach on Patients' Length of Stay in Emergency Department: an Action Research Study

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Abstract- Over the past decade, clinical governance approach with aims to improve the quality of health services has been proposed in Iran. Considering the obvious problems especially patients' length of stay(LOS) in the emergency departments(EDs); the present study has been carried out with the purpose of Investigating the effect of clinical governess approach on patients' LOS in the one of the largest medical centers in the country. After the problem was specified by the 17 interviews with employees and managers of the ED; the emergency clinical governance committee was formed by two academic researchers and seven ED staff (key participants) that had the most involvement with the subject of study. The activities of the committee, including planning, acting, observing and reflecting, was organized by using participatory action research approach and action research cycle (Kemmis 1995). During this time, three formal meetings with key participants were held in 6-month intervals. Monthly records of patients' average LOS and interview with ED staff were used to analyze the findings. The research was completed with two cycles in one year. Committee members took the following actions. As a result, the patients' LOS reduced from 2.68 days to 1.73 days. Make regular patients visits by medical groups especially orthopedists and neurologists; Decision making about patients situation by emergency physicians and transferring patients to the relevant units by bed managers; Refusing to admit elective patients during overcrowding times; to regulate the list of patients requiring ICU by anesthesiologists. Prolonged LOS can be due to various causes and a team approach, which is one of the requirements of clinical governance approach, is needed to manage it. The results showed that the multidisciplinary team could make positive changes and reduce LOS in emergency setting.

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Introduction

"The ED is a unique environment that receives patients with often very complex problems on an unscheduled basis. They may require several urgent interventions to proceed simultaneously in order to prevent death or further injury (1)". However, in most cases overcrowding in the EDs can affect the clinicians' ability to carry out patient-centered care, respect patient privacy and confidentiality and achieve community's trust (2-5). One of the reasons for ED overcrowding is lengthy staying and inadequate patient flow throughout the hospital. These have negative effects on the quality of patients care and their satisfaction (6). In view of the fact that waiting time is increased during these times, waiting rooms become crowded, noisy and stuffy. Therefore, personnel have less time for each patient, which translates to less time to communicate to them, less time to communicate to them, less patient education, less ability to empathy, and *etc*. (5, 7,8).

Ideally, the maximum duration of stay in an emergency department for 98% of patients be no greater than 4 hours (9) or 6 hours (6), while this figure in our country (Iran) is about 2 days (10). During the year prior

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to this study the average LOS was 2.68 days at the hospital where our study took place.

Since a prolonged stay in the emergency department, reduces the possibility of providing services to patients in need of emergency medical care, not only will cause dissatisfaction among patients but it increases death rate due to accidents (11). To prevent such end result and to reduce the negative impact on quality if care, there was need for an immediate interventions.

One of the compatible models with health care is clinical governance approach. This approach had a central role in improving the quality of care in health systems (12), and one of the main priorities of our national health system is reorganizing EDs by implementing this approach (13). Over the past decade, clinical governance approach has been proposed in Iran, and its offices were established in hospitals affiliated with Universities. Moreover, notable measures such as setting up emergency medicine and triage nursing have been taken. Nevertheless, results of some studies show that these units are not effective enough to meet the ever growing needs of clients (6, 10, 14-17). This issue is, perhaps because of the barriers associated with this approach. For instance: Nurses and physicians who work at clinical governance offices do not have enough executive authority to make required changes, or multidisciplinary teams that are crucial requirements to apply clinical governance approach were nonexistent. These teams could improve processes and achieve a solution.

Considering the major issues is patients' prolonged LOS in these departments; the present study has been carried out with the purpose of investigating the effect of clinical governess approach on patients' LOS in ED of one of the largest medical centers in the country.

Materials and Methods

Study design

This project is part of a PhD thesis that has been approved by the Tehran University of Medical Sciences (TUMS). In the first part of this thesis, we qualitatively studied the experience of patients / companions in the ED where the thesis study took place. Results showed that the lengthy stay in the ED is one of their major problems. In order to clarify the problem, its causes and possible solutions, the researcher interviewed employees who were most involved with and affected by the problem. In action research studies, participants are selected based on the subject of the study and research questions (18). For this reason, our participants were not only involved in the emergency care process, but also they had enough authority to make changes and solve problems. Two employee groups participated in the study: key participants and affiliate participants.

Key participants consisted of (1) seven medical and nursing staff that had the most involvement with the subject. The role is defined by the Iranian hospital system and structure in which may not reflect the western health care organization. They were consisted of: hospital's director of nursing services (DNS) this position may also be called Chief Nursing Officer (CNO), chief of ED (who was an Emergency physician and may be called chief medical officer of ED), manager of the emergency unit, chief of Clinical Governance office, bed manager(this refers to a nurse who assigned patient, depends on their needs to the unit in the hospital), building superintendent (a person who was responsible for equipment and cleaning services in ED. This position may be also called Manager of Engineering Department), (2) and two academic researchers (one of whom was responsible for data gathering).

Affiliate participants consist of three emergency nurses and three emergency physicians. They had an indirect, yet active participation in the process of research and their opinions or inputs were valued.

Afterward, an action research team, named the "emergency department clinical governance committee" was formed by key participants. The activities of the committee, including planning, implementing, assessing and revising was organized by using participatory action research approach, using Kemmis' action research cycle (1995). The research was led by two academic researchers whose role as external researchers legally allowed them to conduct research and follow interventions. This study took place over a period of one year and completed two cycles of action research. During this time, three formal meetings with key participants were held in 6-month intervals (beginning of the study, after 6 months, and after a year). It was impossible to hold regular meetings with shorter intervals due to ED overcrowding and busy schedules of employees and managers. The academic researchers received the monthly average LOS in the ED from hospital's statistical unit and interviewed with affiliated participants. Over the interviews, they assessed and explained the outcomes of implementations that were decided in committee meetings. The results of interviews were discussed in individual sessions with the key participants every two months. Interviews were about effects of the changes and actions. Monthly

records of patients' average LOS and interviews with affiliated participants were used to analyze the findings. LOS is defined as the time between registrations to the time that the patient physically leaves the department (19) is discharged or transferred to another unit.

Setting

Imam Khomeini Hospital is the largest health and Medical education Center in Iran; it has emergency medicine and triage nurses and clinical governance offices. This hospital which is affiliated with TUMS is a public hospital with a capacity of more than 1,000 beds.

This hospital was selected, because it has received too many complaints. Not only the hospital holds the highest rate in the number of visits to EDs in the city of Tehran's hospitals but also the LOS in this hospital was unusually longer among the nation.Adult ED of the hospital has 40 beds. However, due to overcrowding and the Ministry of Health policy about providing all patients referred to the emergency department with care services, a number of extra beds have been distributed in the department which makes it a total of 63 beds. Care services are offered to patients over 15 years old with the injury or medical / surgical needs, except for burn victims. Most often, there were no empty beds for new emergency patients, due to overcrowding in ED, which subsequently resulted delays in lengthy stays in the department.

Data collection

In order to clarify the problem, its cause and different aspects and possible solutions, the researcher (academic member of the committee) conducted 17 individual interviews with the medical/nursing staff that could affect the process of reducing LOS. Then two academic members of the committee, analyzed the interview results, categorized and organized the problem origins and its different aspects at the first committee meeting. In addition, they studied and compared the LOS during different months of the year prior to the study. The results of these works were shared with the key participants, three days before the first session of emergency clinical governance committee in March 2011.

Proposed solutions and problem base were discussed. Committee members chose solutions that had the most applicability, and determined a practical goal, a 6 months deadline and staff responsible for achieving the goal by deadline. Selected staff followed up the execution of required actions.

The second meeting of the committee was held in September 2011. The researcher presented the committee members with the interview results and analysis of the LOS over the past 6 months. Members then discussed the reasons behind the success and failure of every task. New strategies were proposed, and committee members eventually agreed upon 5 objectives and determined a 6-month period to achieve them. This actually was the beginning of the second cycle of the research. All the aforementioned steps were also done in the second cycle and details are provided in the "Result" section.

Result

Cycle one

a) First step: Planning

In the first meeting of the emergency Clinical Governance Committee, members defined the problem and planned for improvements. The problem was long duration of stay in ED (2/36 days). According to the results of interviews and discussions, the problem was caused by:

1) Different medical groups such as orthopedic, infectious disease, surgery, etc., did not visit their patients regularly (once per shift). Furthermore visits were most commonly done by residents. Considering the fact that residents do not have the right to discharge or transfer the patients. As a result, many uncertain and worried patients occupy ED's beds for longer than necessary.

2) Lack of vacant beds in other hospital units. As a result, even when it is determined that the patient should be transferred to other units, he/she still remains in the ED.

3) One of the factors that could affect patients' LOS was the redundant and time-consuming process of determining whether a patient needs to be transferred to ICU or not. There was a long delay in putting together a list of patients in need of ICU. It involved a long process: upon the request of a physician, the patient would be visited by anesthesiologist who then would determine whether the patient should be admitted to ICU or not. These visits were done by first-year anesthesiology residents who also were not competent enough to make such decisions. As a result, this process would take 12 to 48 hours as well.

After the committee members discussed the problem and its different aspects, they suggested the following solutions:

- An agreement was established between the hospital board of directors and chiefs of hospital units (who were physician) about paying regular visits to their patients in

the ED. Based on the agreement; physicians should visit their patients at least once per shift. Moreover, they must discharge or transfer the patients to relevant units within 48 hours. Committee members selected Clinical Governance office, DNS and the chief of the emergency unit to oversee the execution of this matter.

- Assigning the responsibility of hospitalizing and referring ED patients to the relevant units, to the ED physicians. The Chief of the emergency unit was chosen to supervise the execution of this subject.

- Committee members Suggested that daily and regular visits be done by anesthesiologist or third-year anesthesiology resident to determine the list of patients requiring ICU bed. Committee members selected emergency clinical governance office to follow up this matter.

At last committee members determined the goal: to reduce patients' LOS by 20% within 6 months (reduced to an average of 1.88 days).

b) Second step: Action

1) In the hospital board meeting, director of emergency clinical governance office proposed an agreement between the hospital board of directors and chiefs of hospital units. The proposal was unanimously approved after assessments and discussions. Both parties signed the agreement within three weeks.

2) In addition, an agreement between the hospital board of directors and the chief of anesthesiology group approved for arranging the ICU patient list. Due to change and replacement of some hospital managers and administrators in May 2011, execution of the agreements was postponed until September of that year. Nevertheless, because of the clinical governance office constant follow ups, terms of the agreement were executed in most medical groups from September 2011.

3) It was decreed that emergency physicians on different shifts were responsible for deciding about medical groups and relevant hospital units for patients. (Associated researcher's and emergency physicians' attempts fell short to give the responsibility of assigning patients to the relevant unit to the emergency medicine group. chiefs of hospital units did not approve of the idea. However, it was decided that the emergency physicians at any given shift determine which medical group is responsible for every patient).

c) Third step: Assessment

The average number of triaged patients from October 2010 to March 2011 was 111.8 patients per day. From April to September 2011, the first 6 months of the research, the rate was 112.33. There was no significant difference in the average number of ED patients (triaged patients) during the study period. Therefore, it was important to compare these two periods using other measures. The average LOS in the ED during a 6-month period before beginning of the study (From Oct. 2010 to Mar. 2011) was 2.36 days; it reached 2.68 days in the first six months of the study (from Apr. 2011 to Sep. 2011). The goal was to reduce this time by 20%; instead it was increased by 7.6%, because the implementation of the agreement was delayed due to change and replacement of some hospital and emergency managers. Besides, the problem regarding lack of vacant beds still existed. The average LOS for patients during the first 4 months of the study not only did not decrease but increased to 3.03 days (the growth rate of 28.38%). However, relatively effective execution of the agreement over the next two months, the average LOS was reduced to 2.5 days, the growth rate of 5.93% (by the end of the first 6 months).

1. According to the agreement, physicians in each group must visit patients at least once per their shifts; however, these visits were implemented solely during the morning shifts. Patients of orthopedic, neurologic and infectious diseases groups had the longest average staying time in the ED. after signing the agreement; visits from infectious diseases group became regular, while the other two groups (orthopedic, neurology) visits remained as irregular as before and instead of the physicians, residents were often visiting the patients.

Nonetheless, these actions had some positive effects. The manager of emergency unit believed:

"Execution of the agreement terms made visits more regular. At this point at least both the staff and the patients are aware of patients' condition. We still don't have enough beds in the unit and patients stay at the ED for a long time. Nevertheless, the fact that physicians visit patients regularly and patient's treatment plan is carried on efficiently is a very positive point both for the patients and the staff" (mu)

2. The next action was assigning the responsibility of determining patients' medical group and the units they should be transferred to, to the emergency physicians. However, emergency physicians believed that as long as there are not enough beds in the hospital units, no positive change is possible. One of emergency physicians stated:

"At this moment only 4 out of 58 patients in the ED are under our care; we assigned the rest to the relevant units. However, there was no point in doing so because other units do not have available beds in order to

transfer their patients. Therefore, the patients stay here… chiefs of units don't want to transfer their patient because of no any effect on their wages… We have no other options but to admit new patients on stretchers in order to perform the diagnostic and therapeutic procedures" (P 1).

The physicians are salary based and some have private practice. Some private patients are directly admitted and hence if the unit is full the doctors are not able to make more money.

3. The hospital administrator made a written request, asking the chief of anesthesiology group to assign an anesthesiologist to make a list of patients needing ICU on the daily basis. Daily monitoring of clinical governance office showed that anesthesiologists' visits were quite consistent and the list of patients requiring ICU was being updated on a regular basis. Regarding anesthesiology group's regular visits, ED manager believed:

"…Regular visits make it possible to quickly identify patients who do not need intensive care. Therefore, those patients are more likely to get transferred to other units … We have severe bed shortage in ICU, but the situation in other units is better. In the past, we had patients in ICU list that did not need intensive care anymore, but we could not transfer them to a non-intensive unit. However, now we do not have this problem and the process of identifying and transferring the patients is more efficient." (MED)

Nursing and medical staff (affiliated participants) believed that considering the number of medical and nursing staff, and available beds in the ED, the number of triaged patients is not unusually high. It is slow patient flow that causes overcrowding in the ED and disrupts the work; in a way that resources are used to provide care for patients whose needs are not supposed to be met at the ED. Those resources must be used for new patients with severe emergency situations. At this step, we evaluated what actions were successful, whether it is necessary to continue the first cycle actions or should we modify them? What else should we do in the next step?

Cycle two

a) First step: Planning

It was determined to achieve the goal (reducing patients' LOS by 20%) within 6 months. Since the beginning of Aug. 2011, when we started to put the agreement to practice, we observed a decrease in patients' LOS (to 2.5 days). However, as we have not reached the goal by that time (decrease by 20%) we started the second cycle of the research. A committee meeting was held in the same month and members discussed and analyzed some issues, such as reasons for failure in reducing patients' LOS in the ED, suggestions and practical solutions and finally deciding on some strategies.

It was planned that the director of nursing services (DNS) of ED, chief of ED, and chief of Clinical Governance office raise the following issues and recommendations at the next hospital board meeting:

Duration of stay was still long, and there were not enough available beds for new critical patients in the ED.

1. The problem was the irregular and inappropriate visits paid by Orthopedic and Neurology groups. Physicians and even residents would not visit the patients regularly. In addition, they only assess the test results, X-rays and other diagnostic tests results to make therapeutic decisions. Visits were often made by first and second year residents.

2. One other factor that could affect patients' LOS was hospital service staffs (transports). According to committee members, presence of enough service staffs speeds up procedures related to the patient (e.g. sending test results, transferring the patients to/ from radiologic centers, *etc.*). Despite the fact that ED was faced with a shortage of service staff, this problem was not disrupting, since most service employees were working overtime. However, in June 2011 it was announced that only up to 40 hours of overtimes per month are paid. This amount of overtime was not enough to make up for staff shortage.

Committee members after analyze and Discussion suggested and approved that:

- Both medical groups (orthopedist and neurologist) provide a daily list of their physician as in charge of visits. Therefore, chief of ED is able to organize the visits. The clinical governance office was identified as responsible for following up that matter.

- Request to board of director to hire at least 3 new service staff and to increase the overtime wage. Follow up by: chief of ED, hospital service manager, and the academic researcher

The Committee members were taken these decisions at the second meeting and ever implemented over the next step.

b) Second step: Action

Items proposed in the committee meeting, were also raised at hospital board of directors meeting by the DNS of ED. The following sections were suggested and

approved in order to organize the physicians' visits:

1) Until there are patients who need to be hospitalized in ED, there should be no elective patient admissions in the hospital units. The elective patients are the direct admit by the unit physicians who charge patients directly while the hospital is providing the bed. In overcrowding times, when the ED staffs is working to its full capacity, and there is no extra bed available, the hospital units must admit critical patients.

2) In the absence of vacant beds, ED patients get admitted in other units (preferably a relevant unit) with the approval of ED bed manager. Patients then get transferred to the relevant unit as soon as possible.

3) The hospital administrator made another written request, asking the entire chief of units to introduce a physician from their unit for daily visits to the ED patients. That physician would visit and decide about ED patients. The request was especially targeting Neurology and Orthopedics discipline.

4) Due to financial constraints; the hospital stopped hiring new service staffs/ janitors. However, four janitors who were primarily stationed at the emergency entrance and would transfer/carry patients upon the request of the ED manager were added to the list of permanent ED staff. Initially, the ED had three janitors for the morning, two for the evening and two for night shifts. Then it is five janitors for the morning and three for each evening and night shifts.

c) Third step: Assessment

1) The average number of visits to the ED from October 2011 to March 2012 was 109/65 (patient / day), and the rate in a year (from April 2011 to March 2012) was 111. During the study period, there was no significant change in that amount; however the LOS was decreased by 26.7%. This was better than what we initially predicted (20%). During the second half of the study, the average LOS was 1.73 days. The shortest average LOS was recorded for November (1.5 days) and the longest was in January (1.9 days).

2) During the second half of the study, the ED bed manager, reported the number of available beds in each unit on the daily basis, and arranged for the patients to be transferred from ED to the relevant units. In November, the inspectors of "the disposition of Patients Committee" visited ED every night and arranged for patients to be admitted in relevant units. As a result, November had the shortest average LOS (1.5 days) compares to other months. One of the nurses (Affiliated participant) believed that:

"… Shorten LOS provides us with more space and beds for new patients. We can take care of our patients more easily and make them and their families feel more comfortable". (AP2)

3) Orthopedic and neurology groups provided the emergency clinical governance office with their list regularly. However, orthopedic chief residents kept making diagnosis only based on patients' diagnostic tests results and refused to visit the patients in person.

4) Regarding transferring and repositioning service workers, ED staff believed that these changes did not improve the ED duties. Hospital building superintendent said:

"Considering the fact that the number of janitors/ service workers did not change, and we only moved them around the ED, we did not observe any improvements in the speed of receiving test results, x-rays, and transferring patients."

The ED manager believed that: "staff shortage is still a problem in the ED and relocating the service workers did not result in any improvements" (MEU).

One of the emergency physicians at the hospital stated: "Although, average LOS has decreased, recruiting at least three service workers could have tremendously speeded up the patient flow in ED. But, unfortunately, ED managers' attempts were not successful in hiring more workers" (AP7).

d) Forth step: Consideration Before Revising the Plan

Researchers, like the first cycle, provided written results and data to the committee members, So that they have enough time to think and evaluate the results. The results were reviewed and discussed by Committee Members at the second meeting (March 2012).

However, due to relocation of ED to another building at the end of March 2012, we could not continue the study any further. The research was wrapped after completing the second cycle.

Discussion

The ED of the hospital where the research took place is one of the most crowded medical centers in the city and, therefore, it has always been facing prolonged LOS.

Overcrowding in Accident and Emergency (A&E) departments is not a new phenomenon nor is it unique to one country (20). It is similar in academic EDs, 94%, and private hospital EDs, 91 %, and its causes are complex and multifactorial (21). Nevertheless, patients and their families expect to "reduced waiting times with a maximum of 6 hours from admission to transfer or

discharge" (20). In the present study, causes of prolonged LOS are such as a shortage of vacant beds in the units, the high number of critical patients requiring ICU, delays in diagnostic procedures, irregularities of physician visits, and visits by residents who were often not sure of the diagnosis or did not have the authority to make decisions about patients' treatment process.

Causes of overcrowding and prolonged LOS in other studies included: "high number of patient, hospital bed shortage, high ED patient volume, radiology and lab delays, and insufficiently ED space" (p151)(21). In addition, testing, particularly for blood testing and advanced X-rays, and treatment, (22) uncertainty about medical diagnosis at teaching hospitals (6), Hispanic ethnicity, CT scan or MRI, hospital location in a metropolitan area (23), characteristics of patients, service time of nurses, service time of physicians (24), and for pediatric patients: presentation during winter, early morning arrival, and IV drugs (25), were associated with prolonged LOS in EDs. This time significantly decreased through the interventions of the present study, (from 2.36 days to 1.73 days). One of these interventions was conducting regular visits by physicians at least once per day in order to determine patients' course of treatment.

In order to improve the experience of older people admitted to the ED, Victorian Department of Health (2010) suggested that patients must decide whether medical students to be involved in their care process or not. In addition, students must have the necessary skills to provide care and should be closely supervised (26). However; our teaching hospitals do not make any of these considerations. As a result, they are faced with unsatisfied patients and long LOS. Other intervention of this study was asking emergency physicians to determine medical groups responsible for each patient. Wagner *et al.*, (2010) quoted that: "As one of the youngest medical specialist, emergency medicine has been proactive in improving patient care" (27), and all of them agree on standards to facilitate change and reduce overcrowding in EDs (9). Moreover, since emergency physicians are present in the ED all the time, they are the most qualified individuals to make decisions about patients' status. Other intervention was refusing to admit elective patients (direct admit by unit physician) in hospital units in times of overcrowding, and admitting ED patients in related or even unrelated units (done by hospital bed manager).

Bekmezian *et al*., (2011) also suggested that in order to reduce LOS, extra beds should be allocated to EDs during winter or late hours of the night for emergency pediatric patients (25). Some researchers have been using well known methods to reduce waiting times and LOS. For instance Ng *et al*., (2010) were able to reduce wait times in the ED by implementing "Lean techniques such as value stream mapping, in time delivery techniques, workplace organization, reduction of systemic wastes, use of the worker as the source of quality improvement and ongoing refinement of our process" (p50)(19). The choice of strategies and methods should be based on the specific conditions of each country or state, or even the ED. The same method is not necessarily practical to solve these problems at any ED. Making anesthesiologist visits to ED as regular as possible was one of the other interventions of our study. Bekmezian *et al*., (2011) regarding pediatrics ED quoted those children requiring ICU admissions in the ED had a lower risk of prolonged LOS (25). Inconsistencies in the results could be due to a severe shortage of ICU beds in the hospital. Sometimes it can take up to two weeks for ED patients to be admitted to the ICU. Hiring new service staffs/ janitors were not possible due to financial constraints. Therefore, the next intervention used in this study was relocating service staffs/janitors to the emergency unit in order to increase the number of emergency employees and to speed the diagnosis processes. This action was not successful, since the numbers of employees were not, in fact, increased; they were only relocated from another unit of the hospital to the emergency unit. Bekmezian *et al*., (2011) proposed to increase the number of emergency personnel in order to reduce LOS (25). McHugh, et al (2010) also reported that staffing shortages are an important barrier in the way of improving patient flow, and reducing congestion in the emergency (28). Because the proportion between the number of emergency staff and patients is established so they will have enough time to provide services with a better quality.

This study showed that the formation of multidisciplinary teams and collaboration between health care groups can reduce LOS in the ED, without imposing high costs. Furthermore, this study indicates the potential competence of action research method in a particular environment.

This study has investigated ED LOS at only one ED, and we took those actions based on the specific circumstances of our country which limits the generalizability of results.

Prolonged LOS can be due to various causes, and a team approach is needed to improve it. Since one of the requirements for the implementation of clinical governance is establishing multi-disciplinary teams, it

can also be useful for this purpose. The results of this study showed that if clinical governance office involves the practitioners, it could make positive changes and adjust existing practices in order to improve LOS, and the patients flow through the emergency setting.

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