Exploring delay points at the emergency department

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Abstract

Background: The increasing time spent in the emergency department is becoming a global problem contributing to overcrowding. The increased length of stay in the emergency department can negatively affect patients' perception of care, contributes to high morbidity and mortality rates, and increased aggression towards staff. Therefore, understanding the delay points will help administrators and policy makers channel resources to the areas that require improvement.

Methods: This quality improvement project uses a cross-sectional descriptive study to evaluate the delay points in the emergency department. The study was conducted at a level IV community hospital in British Columbia. One hundred sixty-seven participants were recruited using a consecutive convenience sampling.

Results: The age of the respondents ranged from 18–101 years. There were more females (*n* = 85, 50.9%) than males (*n* = 80, 47.9%). The care point with the longest wait time was diagnostic and laboratory testing to physician reassessment (median time 65 minutes), followed by initial physician assessment to imaging (median time 52 minutes) and, finally, nurse-to-physician assessment (median time 45 minutes). Despite the prolonged length of stay in the emergency department, most participants rated the experience at the emergency visit favourably (70, 42%) and 49.1% were satisfied with the care provided by the staff, while 59.9% indicated that they would recommend this emergency department to others.

Conclusion: Diagnostic and turnaround time and waiting for physician reassessments are important points in the patient journey in the emergency department that can prolong length of stay. Future studies are needed to determine whether various interventions such as point-of-care testing, utilizing the Lean Model, and improving physician services can help reduce lengths of stay in the emergency department.

Keywords: Emergency department, length of stay, points of delay, patient experience.

Background

Overcrowding and long wait times in the emergency department (ED) are increasingly becoming a global concern, and some countries have considered the situation to constitute a national crisis (Eitel et al., 2010). Furthermore, ED overcrowding occurs when ED arrival rate (input) exceeds ED discharge and transfer rates (output), leading to an increase in the healthcare demand. This increased demand can result in periods when demand for care exceeds supply of available care providers, resulting in extended wait times for treatment initiation, ED length of stay (LOS), and delays in the admission or discharge of patients (Sullivan et al, 2016). Although this statement may seem trivial, it is crucial in terms of improving quality indicators and improving patient care outcomes.

It is important to understand that the problem of overcrowding is multifactorial. Studies have found that a slow triage process can lead to ED overcrowding, prolonged wait times, and extended lengths of stay (Van der Linden et al., 2016). Other factors that have been associated with ED overcrowding are reduced access to primary healthcare centres, an aging population that has increased demand for complex chronic disease management, and decreased service availability (Ackroyd-Stolarz et al., 2011; Bullard et al., 2009; Legramante et al., 2016). Despite efforts to address some of these issues, the problem of overcrowding remains to be solved in most countries.

Understandably, prolonged wait times can frustrate patients, negatively affect their perception of care, contribute to high morbidity and mortality rates, and increase aggression toward staff, as well as reduce staff retention and satisfaction (Ackroyd-Stolarz et al., 2011; Thompson et al., 1996; Shah et al., 2015). Addressing congestion in the ED could help increase satisfaction amongst patients and staff in the ED.

Emergency department functioning is best conceptualized using three phases: input, throughput, and output (Asplin et al.2003). Strategies specific to each phase are often proposed, such as ambulance diversion, to reduce ED input, fast-tracking patients, and accelerated triage and registration to improve throughput, and the use of discharge protocols, for output and protocol development (Shah et al., 2015; Yarmohammadian et al., 2017). However, some of these interventions have shown mixed results concerning reducing wait times, and facilitating patient satisfaction. Patients continue to express frustration with the wait times despite attempts to improve care through different interventions, and some leave without being seen (LWBS) by a care provider, which can adversely affect safety, the general quality of healthcare, and experiences of care (Bonalumi et al., 2017). Therefore, understanding the exact delay points in care may help us better serve patients seeking care in the ED and improve patient-care outcomes.

The purposes of this study were to determine the wait times at a community hospital ED, and explore the exact points where delays happen. We also explored patients' satisfaction with the experience of seeking care in relation to their length of stay.

Theoretical Framework

This study was guided by Watson's theory of human caring (Watson, 2006; Watson 1996). We found this theory applicable to our study as caring behaviour could contribute to patient's satisfaction, wellbeing, and organizational performance (Kaur et al., 2013). Guided by the three vital concepts of the theory (transpersonal caring, the caring moment, and 10 caritas processes; Watson, 2006), the nurses or researchers are able to provide "value guided vision of care" (Watson, 2006), which will, in turn, reduce ED wait times and improve patient satisfaction. As Watson's posits, "Any profession that loses its values becomes heartless, any profession that becomes heartless becomes soulless, any profession that becomes heartless and soulless becomes worthless" (Watson, 2006., p.49).Methods

Study Setting

This Quality Improvement (QI) project was conducted at a community hospital emergency department in British Columbia, Canada. The facility is a level IV trauma hospital and receives approximately 20,000 ED visits annually.

All patients aged 18 years and above visiting the ED were eligible. Exclusion criteria include:
1. Canadian acuity triage scale (CTAS) level 1 (one; patients requiring resuscitation)
2. acute psychotic patients requiring a code white
3. pediatrics patients (under 18 years)
4. pregnant women >20 weeks in active labor.

Design

This is a QI project using a descriptive cross-sectional design. This design was chosen to accurately and systematically describe the ED wait times, and to understand the patients' experience of care. Using this design, we were able to answer the following questions:
a. What are the wait times and delay points at the emergency department?
b. What is the experience of patients seeking care in emergency departments in relation to their length of stay?

Data collection

Using convenience sampling, participants for this QI project were recruited between April 1 and May 1, 2021. Institutional clearance and approval was obtained prior to data collection (Fraser Health, 2021). The data collection tool included a questionnaire with 20 open- and closed-ended questions divided into three sections. The closed-ended questions assessed demographic data, such as age, gender, ethnicity, and educational level. In the second part of the questionnaire, participants were directed to record time spent at each point of care seeking journey (e.g., triage, nurse assessment, physician assessment and imaging).

The last section of the questionnaire included a list of questions that were adapted from a previously published study by Shah et al. (2015), because of similar context and research questions. The questions aimed to capture the patients' experiences at the ED. Participants were asked to rate their ED experience using a Likert scale ranging from 1(very poor) to 5 (very good) about the wait time, courtesy of the staff, the level at which they were kept informed and their overall rating of the ED experience.

The research team who collected the data consisted of two Registered Nurses (RNs), two Licence Practical Nurses (LPNs) and one care aid/screener. After unit-specific approval was obtained, 205 copies of the data collection tool were printed and distributed to the research team. The research team gave participants the questionnaires at registration and asked them to place their completed questionnaire in a box at the exit of the hospital before leaving the hospital. However, only a few questionnaires were deposited in the box, as patients were not placing them in the right spot. Therefore, the data collection team revised its distribution plan and, instead, checked in frequently with the participants or the nurse on duty to collect the questionnaires.

Data analysis

Data were recorded on paper questionnaires and then entered on an Excel spreadsheet (Microsoft Excel 2021) by the first author and other research team members. Data entry was validated by the second author. Data were analyzed using Statistical Package for the Social Sciences (IBM SPSS Statistics, version 26, 2019). Categorical data (e.g., demographics, patient experience survey) are summarized as frequencies and percentages, while continuous data are summarized as median and interquartile range (IQR). We chose to use the median and IQR because data were skewed and those the appropriate measures of central tendency.

In this study, we used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines as a validation tool/framework for ensuring high-quality presentation of this study (Von Elm et al., 2008).

Results

A total of 167 questionnaires were analyzed; 38 (19%) were excluded because 34 questionnaires had not been returned and four had incomplete data (Table 1). The age of the respondents ranged from 18 to 101 years, with the majority being older than 75 (n = 30, 18%). There were more females (n = 85, 51%) than males (n = 80, 48%) or queer individuals (n = 2, 1%). Sixty-two (37%) of the respondents were high school graduates and 14 (8%) had less than high school education. Meanwhile, 44 (26%) had college certificates and 24 (8%) held a Masters' degree or higher. Respondents were from various ethnic backgrounds, but the majority were Caucasian (n = 96, 58%), Asian (n = 36, 22%) and First Nations (n = 6, 4%).

The vast majority (103, 62%) of the participants sought care during the hours of 0600h to 1400h, with the least number of patients seen between 2200h to 0600h (15, 9%). Most of the participants visited the ED on Thursdays: (29, 17%), while fewer participants sought care on Tuesdays and Wednesdays (19, 11%) during the duration of the study.

Time intermissions

In this study, we captured 10 points of care representing the patient journey in the ED. The time points include
1. registration to triage nurse assessment
2. triage to laboratory tests
3. triage to imaging tests (contrast tomography [CT], electrocardiogram [ECG], X-ray, ultrasound [US], magnetic resonance imaging [MRI]).
4. triage to placement in the room (nurse assessment)
5. nurse assessment to tests (laboratory tests, imaging, and electrocardiogram)
6. nurse assessment to physician assessment
7. physician assessment to laboratory tests
8. physician assessment to Imaging
9. tests to physician reassessment
10. total time spent in the ED.

Although the above time points are a typical ED workflow, not all patients pass through each point of care during their ED visit. The need for each point of care is per patient's condition and needs. However, each patient passed through registration to triage before proceeding to other points of care, if necessary.

Once the data were collected, the total time spent in the ED was calculated. Since the data were skewed, we used the median and interquartile range (IQR) to report time spent at each point of care. The median time from registration to triage and triage to nurse assessment were 11 and 35 minutes respectively (Table 2). Median time from nurse assessment to physician assessment was 45 minutes. The time between undergoing testing to physician reassessment median time was 65 minutes. Overall, median time spent in the ED was two hours fifty-five minutes (175 minutes). The delay points based on the findings include tests to physician reassessment, with a median time of 65 minutes, physician to Imaging median time, 52 minutes, and nurse to physician assessment with a median time of 45 minutes.

Participants rated wait times as 4 (good) on a Likert scale from 1 (very poor) to 5 (very good; Table 3). Similarly, patients responded positively about being informed about delays (50%). In response to their overall experience at the ED, 49% (n = 82) of the respondents selected five (very good) on staff courtesy. Furthermore, 46% (n = 77) of respondents chose very good information on wait times, and 60% (n = 100) recommended this ED to others. However, 28% (n = 47) of the respondents rated the ED as poor (2), and 42% (n = 70) perceived their wait times long.

Disparity in experience

Evidence suggests patients of various ethnic backgrounds, particularly Indigenous people of Canada and those of African descent, encounter negative experiences in the ED (Goodman et al., 2017; Turpel-Lafond, 2020). Thus, additional analyses were performed to explore the association between self-reported ethnicity and ED experience. Regarding staff courtesy, overall, Caucasians had a wide range of responses from very poor (n = 3, 3%) to very good (n = 49, 53%; Table 4). Participants who identified as Asian Canadians had similar responses from very poor (n = 1, 3%) to very good (n = 49, 53%). Participants identifying as indigenous Canadians (n = 3, 50%), African Canadians (n = 2, 50%), and other ethnic groups (n = 7, 47%) rated staff courtesy as very good (5) on a Likert scale of 1–5 (1 very poor and 5 very good). For overall ED ratings, most Caucasians (28, 33%) rated the ED as poor. Similarly, 3 (50%) of First Nations participants rated the ED as poor (2) and other ethnic groups (33%). However, most of the participants who identified as Asian Canadians (11, 31%) rated the ED as good (Likert 4). Due to the small sample size, we could not perform subgroup analysis by ethnic group.

Discussion

Our study aimed to determine wait times, delay points in the ED, and assess patient satisfaction with ED experience. The median total ED wait time was 175 minutes (a quartile range of 100 to 264 minutes), with the longest wait being from diagnostic turnaround time to physician reassessment (median 65 mins) and the shortest wait time being from registration to triage (median time 11 minutes).

These wait times were not surprising, because blood samples have to be collected and transported before being analyzed. Point of Care Testing (POCT) is a quality improvement

intervention that has been shown to reduce ED length of stay (Eitel et al., 2010). Introducing POCT to the ED and training ED staff to conduct laboratory tests has been shown to decrease laboratory turnaround time in various facilities and overall ED length of stay (Eitel et al. 2010).

Similarly, patients waiting for imaging must wait for a porter to transport them to imaging when the department is ready for them. In addition, this facility has limited imaging equipment (MRI, CT, and US) for both inpatients and outpatients. That said, it is essential to look at models that can improve the wait times. The lean model seeks to enhance ED performance and meet customers' needs by reducing complexity and improving unnecessary or non-value-added activities (Improta et al., 2018). This process can be achieved by following the theoretical path of the patient and applying tools that would reduce unnecessary waits from arrival to discharge. Further, lean thinking involves a re-engineering process that improves the management of medical reports from imaging by applying accurate notifications when messages are ready. This model demonstrates that applying the lean methodology to all points of care can improve flow and ED wait times.

Another way to apply lean principle to improve front-end care models and improve patient flow is to eliminate traditional triage and have a multidisciplinary care team assess patients on arrival. These proposed lean strategies have shown positive results in reducing wait times and improving ED flow (Rutman et al., 2015).

In a study investigating a relationship between patient satisfaction and communication of expected wait times, most patients were more likely to accept longer wait times provided their expectations were managed via communication (Shah et al., 2015). This finding suggests that patients would like to be informed about the wait times to meet their expectations and a more customer service-centred approach may achieve this finding.

Most participants rated the overall ED wait times as poor (n = 47, 28%). The high percentage of poor rating was surprising, especially given that most of the participants (100, 60%), indicated that they would recommend this ED to others. This finding may suggest that the patients are unhappy about the long wait times, but they like the service they received in the ED, or this could be the only ED in the area and participants may not want to travel longer distances for ED services.

Studies have found patient satisfaction plays a crucial role in the healthcare system, as an indicator of the quality of care (Mohanan et al., 2010). A study done in Portugal found that overall "satisfaction with doctors" and "feeling that expectations have been met" are the main predictors of satisfaction and perceptions of healthcare (Abidova et al., 2020). Other studies have found that nursing care, including keeping patients informed about delays and keeping family and friends informed, is also significantly associated with patient satisfaction (Boudreaux et al., 2000; Wiley, 2017). These findings are essential for quality improvement and reduce patient dissatisfaction with care even when the wait times are long.

How Watson's theory of Care informed our Project

The primary goal of this project was to infuse Jean Watson's theory to practice as a way of humanizing healthcare workers in practice, so they understand the patient's points of delay in the ER. Implementing this model has been an enlightening journey; observing how the nurses interact with patients and families as they wait to be seen showed how important it is for nurses to know themselves and others. When patients and family members continued to ask nurses how long the wait times were, nurses would avoid looking the patients/families in the eyes because of not knowing what to say. As a result, patients were frustrated because of the length of stay and would stop participating in the study. Using Watson's theory in our project helped the nurses reflect on the "meaning of what it means to be human, to be vulnerable, to be ill, to be cured, to healthy, and to be healed" (Watson, 2006, p.48). This theory also helped us drive away from the traditional healthcare model that leans toward economy, budgets, and administration to humanizing healthcare. Nurses participating in this QI project took time to explain the project purpose to the participants and how the results would help identify the points of delay.

Limitations of the study

The major limitation of this study was that our questionnaire failed to capture data on patients waiting for specialist consultations, as this might be another point of delay in the ED. We recommend that future research incorporate consult wait times in data collection. Another potential limitation is social desirability bias. We found that some patients might have been uncomfortable rating the institution or staff because the research assistants were employees of the institution. One participant stated, "I do not want to get anyone in trouble," and another participant wrote, "The staff are doing a great job. Pay them more." In other words, the participants believed that the institution was surveying the staff. Future research should have research assistants state the purpose of the study, use non-employees for data collection or employ anonymous methods to capture the information. Lastly, we did not collect the Canadian Triage and Acuity Scale (CTAS) level or understanding of the patient, because this would have required us to access the health charts. Future studies should look at the association between the patient's acuity level and their ED wait time.

Conclusion

Improving ED throughput remains a top priority for healthcare administrators in Canada. Long ED wait times have been associated with adverse effects on the institution, patient care outcome, and staff morale. This quality improvement project found that the longest wait time is from tests to physician reassessment, followed by triage to imaging. To improve ED throughput, we suggest implementing the Lean Model, which has been shown to improve the efficiency of services, reduce wastes and improve quality of care. Further, establishing a POCT centre in the ED may help expedite test results and reduce patients' time for those tests and results. Finally, future studies should look at the causes of delays at imaging or laboratory and quality improvement projects that will expedite wait times and reports.

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