Online Ratings of the Patient Experience: Emergency Departments Versus Urgent Care Centers

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Study objective: Individuals increasingly use online rating platforms to rate and review hospitals. We seek to describe and compare publicly available online review content and ratings of emergency departments (EDs) and urgent care centers.

Methods: We analyzed Yelp reviews of EDs and urgent care centers to identify topics most correlated with 1- and 5-star ratings. Latent Dirichlet Allocation, a method of identifying groups of co-occurring words in narrative text, was used to identify and label 25 topics across 1- and 5-star reviews of urgent care centers and EDs. Differential Language Analysis was then used to measure the correlation of these topics with 1- and 5-star reviews for urgent care centers and EDs.

Results: We analyzed 100,949 Yelp reviews, 16,447 from 1,566 EDs and 84,502 from 5,601 urgent care centers. There were significantly more 5-star urgent care center reviews (n=43,487; 51%) than 5-star ED reviews (n=4,437; 27%). Themes associated with 5-star reviews among EDs and urgent care centers were similar for comfort, professionalism, facilities, pediatric care, and staff interactions. Themes associated with 1-star reviews among EDs and urgent care centers were similar for communication, telephone experience, waiting, billing, pain management, and diagnostic testing. Themes unique to 5-star ED reviews included bedside manner, care for family members, and access. Themes unique to 5-star urgent care center reviews were based on recommendation and prescription refills. Themes unique to 1-star ED reviews were service and speed of care. Themes unique to 1-star urgent care center reviews were lack of confidence and reception experience.

Conclusion: Understanding drivers for high and low online ratings and what patients value in their ED and urgent care center experiences offers insights for health systems and providers to improve acute care delivery. Patients' perspectives may become increasingly important as they seek care in the expanding urgent care markets. [Ann Emerg Med. 2019;73:631-638.]

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INTRODUCTION

Background

Nearly 1 of every 3 Americans received care at an urgent care center in the past 2 years.[1-4] Urgent care centers have become an alternative to the emergency department (ED) for acute medical needs.[1,2] The growth of urgent care centers has become readily apparent across the country as private companies, both small and large, have begun opening freestanding urgent care centers or centers located within pharmacies, grocery stores, or other shopping areas. Little is known about urgent care delivery in terms of cost, quality, or patient experience because the expansion of urgent care centers has been rapid, exponential, and driven by many different groups. Understanding how patients perceive these overlapping acute services may offer insights into why they are accessing urgent care centers, how they describe their experiences, and how to improve them.[5,6]

Previous research evaluating patient satisfaction in the outpatient setting suggests that satisfaction is highest when patients receive care from their own physician and that accessibility of care and hospitality of staff affect satisfaction more than the quality of medical care received.[7-9] Studying differences in the patient experience between the ED and urgent care centers can provide insight into patients' needs and perceptions of these services. Furthermore, understanding differences in the patient experience may help health systems improve the allocation of, and investment in, alternative acute care settings.

Editor's Capsule Summary

What is already known on this topic
Online platforms such as Yelp and Google provide ready opportunities for patients to comment on care.

What question this study addressed
What can we learn through analyzing and comparing Yelp ratings and reviews of emergency departments (EDs) and urgent care centers?

What this study adds to our knowledge
Both EDs and urgent care centers receive online reviews. Urgent care centers rate better than EDs. Themes of positive reviews for both include comfort, overall experience, pediatric care, professionalism, cleanliness, and staff interactions.

How this is relevant to clinical practice
Online reviews may provide a different understanding of patient satisfaction than more traditional methods such as surveys.

Importance

Patients have increasingly used online platforms to review their health care experiences. Yelp (http://www.yelp.com) is a widely used and freely accessible Web site for this purpose.[10] Although often dismissed as unverifiable and unstructured, Yelp reviews can provide a rich, narrative description of the patient experience that is difficult to capture through traditional, standardized hospital surveys.[11,12] Additionally, patients often discuss elements of care important to them that are not yet covered in these hospital surveys.[13]

Yelp and other online platforms offer a real-time method of capturing the patient's thoughts, feelings, and experience. Individuals posting reviews can be located in the waiting room or treatment room, providing regular updates on their experience. One patient posted, "This place is absolutely terrible…. I've been here for 7 hours and still have not been treated…. I pressed the nurse button and did not get a response for over 4 hours. Terrible." Unlike the publicly inaccessible data collected by Press Ganey, Yelp provides a platform for sharing a public, searchable review in a forum that allows patients to read about others' experiences before, during, or after their own encounter. Yelp also reflects the views of patients' family, friends, or caregivers, who can also post reviews.

Although researchers have analyzed ED Yelp reviews,[14] online ratings of urgent care centers and how they compare with those of EDs have not yet been explored. With more than 183 million unique visitors monthly and 140 million reviews, Yelp provides a unique opportunity for analyzing the patient experience in a largely unstudied area.[15]

Goals of This Investigation

The primary objective of this analysis was to define, describe, and compare Yelp review content and ratings of EDs and urgent care centers. This analysis may help reveal the drivers of high and low patient satisfaction in these acute care settings.

MATERIALS AND METHODS

This was a retrospective analysis of online reviews of EDs and urgent care centers within the United States. This study was considered exempt by the University of Pennsylvania institutional review board.

Yelp consists of a variety of online reviews across services and retailers. To select reviews of EDs, we first identified hospitals using the list of facilities reporting data to the American Hospital Association. To further ensure that reviews were targeted to EDs, Yelp reviews were searched for user mentions of ED-related terms: "emergency department," "emergency room," "ER/ED," and "emergency medicine."

To identify urgent care center reviews, the study used Yelp's application program interface, which specifically requires businesses to register their information on the site to identify their service or Yelp category such as restaurant or hotel, or, in this study, to identify urgent care services in the United States. Online reviews were extracted from May 2005 to March 2017.

Reviews "not recommended" by Yelp, and thus likely to be fake, were excluded. Yelp uses a proprietary algorithm that considers measures of quality, reliability, and activity on Yelp to estimate the authenticity of each review.[16] For example, this algorithm would prevent a user from leaving multiple reviews on a business page under different user names. Additionally, Yelp states that businesses that buy advertising space on the site are unable to influence which reviews are recommended.[15]

We analyzed the distribution of Yelp ratings across EDs and urgent care centers. Yelp users are able to select 1 star (lowest rating) through 5 stars (highest rating) for each review. We also compared how these ratings compared with all business reviews on Yelp from the same time.

Latent Dirichlet Allocation, an automated process used to analyze co-occurrences of words in narrative text, was used to generate 25 topics from the Yelp reviews of EDs and urgent care centers.[17] Latent Dirichlet Allocation provides a method to use computer-based software and programming to analyze and identify themes in large data sets composed of narrative text such as user reviews or Twitter tweets. Themes were created by first using 2 broad groups for Yelp reviews

among urgent care centers and EDs. In this study, we chose to focus on extremes of ratings (low, or 1-star, and high, or 5-star). We chose to examine the extremes of the scale in this study to maximize the possibility of identifying clear drivers of high or low patient ratings of the ED or urgent care center experience. The next step included applying Latent Dirichlet Allocation to identify topics. This process analyzes low- or high-star reviews and searches for co-occurring words in one user review that are then found across multiple reviews to create an a priori number of groups of words that can then be labeled by the research team. In this study, 3 study team members (A.K.A., C.T., and R.M.M) independently labeled topics that were found to be similar. As the number of groups becomes smaller, the granularity of the data is lost, and as the number of groups becomes too large, the detail across groups becomes lost. This study used 25 groups as used in previous published studies analyzing online reviews.[18-21] The implementation of Latent Dirichlet Allocation was provided by the Machine Learning for Language Toolkit (MALLET) package.[22] Latent Dirichlet Allocation has been used in various studies examining online reviews of hospitals.[18-21]

We used differential language analysis, a method of open-vocabulary analysis,[23] to calculate the topic distribution of the reviews and determine which topics were most correlated to Yelp review ratings. Differential language analysis builds on the topics generated with latent Dirichlet allocation to identify correlation. Latent Dirichlet allocation analysis here provides the topics identified within 1- and 5-star reviews as described above. Differential language analysis then allows an analysis to determine which of the latent Dirichlet allocation topics have a true correlation to 1- or 5-star reviews. The end product of differential language analysis provides a correlation coefficient from 0 to 1, correlating the topic with the star rating. Differential language analysis was performed with the Differential Language Analysis ToolKit. We provided an example quote for each topic by selecting a quote from a list of the 5 Yelp reviews most associated with each latent Dirichlet allocation topic.

Primary Data Analysis

We used summary statistics to describe the sample of Yelp reviews and ratings. We calculated Pearson's correlation coefficients between the topic content of the review and the review rating for ED reviews and for urgent care center reviews. Because of the bimodal nature of Yelp reviews, correlations were calculated between a binary variable indicating whether the review was a 1-star review (value of 1 for 1-star reviews, value of 0 for all other reviews) and the topic distribution in the reviews. This was repeated for 5-star ratings.

RESULTS

We identified a total of 100,949 Yelp reviews, 16,447 ED reviews from 1,566 hospitals (10.50 reviews per hospital) and 84,502 reviews from 5,601 urgent care centers (15.09 per site). All reviews identified with the above process were used; none were excluded. The Figure displays the distribution of low to high reviews. The median of ED reviews (2.0) was lower than the median of urgent care center reviews (5.0). Although 62% of ED reviews are 3 stars or fewer, 60% of urgent care center reviews are 4 or 5 stars or more and approximate the distribution of all other Yelp-rated business.

Tables 1 and 2 outline the more correlated themes across positive and negative ED and urgent care center reviews. Themes similar across ED and urgent care centers in 5-star reviews included comfort and overall experience ($r=0.53$ and $r=0.49$, respectively), professionalism ($r=0.47$ and $r=0.47$, respectively), clean facilities ($r=0.19$ and $r=0.30$, respectively), pediatric care ($r=0.12$ and $r=0.12$, respectively), and friendly staff interactions ($r=0.45$ and $r=0.46$, respectively).

Themes similar across ED and urgent care center in 1-star reviews included poor communication ($r=0.34$ and $r=0.37$, respectively), telephone or reception experience ($r=0.29$ and $r=0.29$, respectively), waiting ($r=0.23$ and $r=0.20$, respectively), billing or insurance issues ($r=0.19$ and $r=0.25$, respectively), pain management ($r=0.23$ and $r=0.23$, respectively), and diagnostic testing ($r=0.16$ and $r=0.19$, respectively).

Themes unique to ED 5-star reviews included bedside manner ($r=0.37$), care for family members ($r=0.18$), and access to care on nights or weekends ($r=0.06$). Themes unique to urgent care center 5-star reviews related to recommendation ($r=0.38$) and pharmacy refills or prescriptions ($r=0.07$). Themes unique to EDs in 1-star reviews included overall service ($r=0.34$) and speed of care ($r=0.23$). Themes unique to urgent care centers in 1-star reviews included lack of confidence ($r=0.38$) and reception experience ($r=0.06$).

LIMITATIONS

Our approach of identifying reviews of EDs and urgent care centers may be limited because patients may not have used key words or posted to the ED or urgent care center directly. Key words may have also linked to another use of the word "emergency" in different contexts. For example, a user may have posted a review about the inpatient care and used the word "emergency" in another context not related to the ED, and thus this review would have been included in our analysis. Unlike systematic surveys, online reviews are not standardized and do not offer protection from
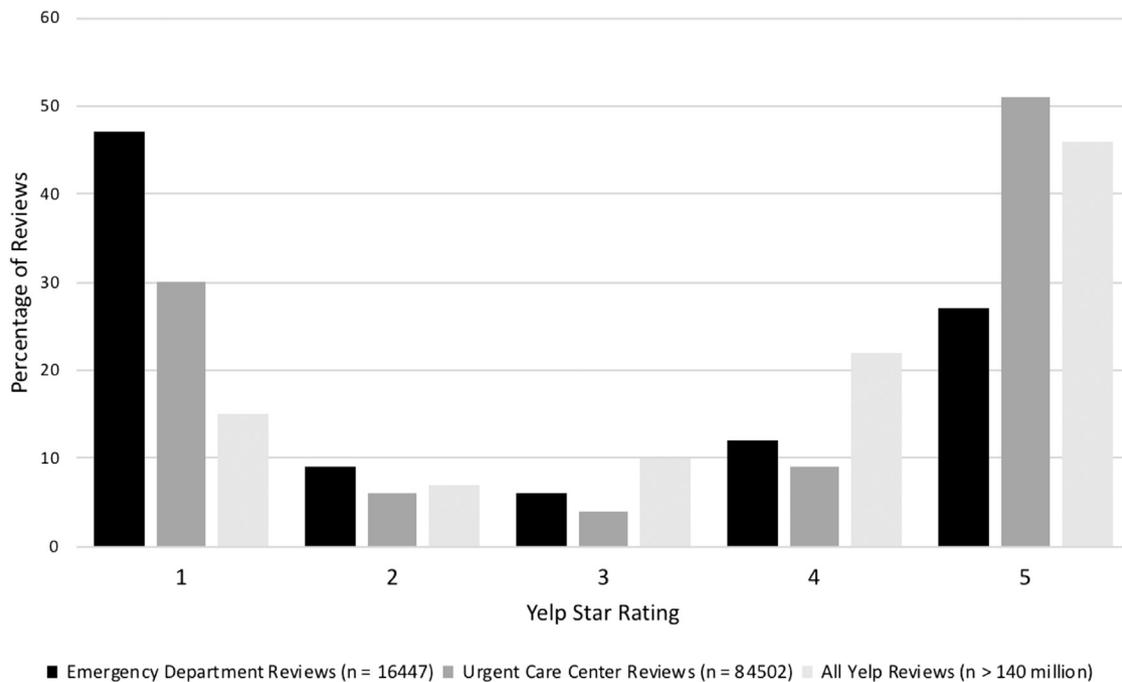
Figure. Distribution of ratings of ED, urgent care, and all Yelp reviews. Star ratings range from 1 star (the lowest rating) to 5 stars (the highest rating). The horizontal axis represents the star ratings for the reviews, and the vertical axis represents the percentage of reviews. Black bars represent ED reviews (n=16,447), gray bars represent urgent care reviews (n=84,502), and the light gray bars represent all other Yelp reviews (n>140 million). Both ED reviews and urgent care reviews show a bimodal distribution, whereas all other Yelp reviews are skewed toward higher star ratings.

fraudulent responses. And although both online and systematic reviews are likely to favor individuals who most want to share their opinions, online reviews cater to those who seek the opportunity to comment. Also, because it is an open and public forum, any individual is able to post his or her comments and reviews on Yelp, and thus a service or business may have reviews posted by users who never actually were cared for by the urgent care center or ED.

We ascribe sources of care based on the content of reviews, not on external evidence of source of care. For example, people can describe their medical condition as an "emergency" yet receive care in a space outside of the ED. Similarly, urgent care centers are defined broadly, ranging from a walk-in service integrated within a hospital to a national chain.

With the latent Dirichlet allocation approach, groups of words were identified and the study team developed themes. Although these themes were agreed on by 3 members, they could have been labeled differently by others analyzing the groups of words from another perspective. The differential language analysis shows correlation between these themes and the low- or high-star ratings; however, these correlations are not causation and not profoundly strong, nor are they directly comparable in all settings. The models and delivery of urgent and

emergency care vary widely across the nation, and thus this analysis provides a very general view of online ratings. The patients posting on Yelp have a clear motive to share their good or bad experience with others, leading to a natural selection bias in this analysis of ED and urgent care center patients who use or post to Yelp and those who do not.

DISCUSSION

This study has 3 main findings. First, patients and caregivers are sharing their ED and urgent care center experiences on Yelp. We have identified greater than 100,000 Yelp reviews across both ED and urgent care settings during the past 11 years. During the study timespan, approximately one ED or urgent care center Yelp review was posted every hour of every day. As patients begin to view health care more as a retail service, many are sharing their opinions and perspectives about emergency and urgent care through online platforms such as Yelp. To our knowledge, this study is the first to analyze and compare those reviews.

Second, Yelp reviews of EDs and urgent care centers are bimodal. Although EDs and urgent care centers follow the same trends as other services and businesses on Yelp, a much higher proportion of the ratings are 1 star (47% ED

Table 1. Similar themes in reviews of ED and urgent care centers.

Theme	Quotes From Example Review Text	Pearson's *r*
5-Star themes	**Sample Narrative Text**	
Comfort and overall experience	I cannot say enough good things about this hospital and staff. The [ED] was great. I had wonderful doctors. But the nurses are beyond wonderful. They made me feel safe and calm and well cared for. Every person I encountered was exceptional. I am so impressed and thankful to have been treated at this hospital.	ED *r*=0.53
	The staff here were great. They always make me feel comfortable in an uncomfortable situation.	UCC *r*=0.49
Professionalism	Excellent care [and] excellent service. They attend to the patient's needs. The [ED] staff is excellent. They all deserve a medal.	ED *r*=0.47
	Excellent and prompt service. The staff was very professional and competent. Highly recommend!	UCC *r*=0.47
Facilities	Large parking garage next to [ED] with free parking. Very efficient check in system. Wifi in [ED].	ED *r*=0.19
	Beautiful, exceptionally clean building. Friendly, helpful, super nice people.	UCC *r*=0.30
Pediatric care	My 6 year old daughter visited the Pediatric [ED] for a severe asthma attack. She was seen immediately, and received excellent, expert care.	ED *r*=0.12
	Hands down the best place to take your child during off hours! So friendly, really great kid environment. They make it easy to be a parent of a sick child here.	UCC *r*=0.12
Staff interactions	Best customer service. [ED] super fast n attentive. The best hospital, super clean. Stayed under intensive care for a week had a good experience.	ED *r*=0.45
	Friendly staff, fast care, excellent providers. Top notch urgent care!!!	UCC *r*=0.46
1-Star themes	**Sample Narrative Text**	
Poor communication	This is without a doubt the most unorganized [ED] ever. Dr's treat patients in hallways. No patient confidentiality or privacy in the hallway with other patients sitting there. Blood pressure and vitals taken directly in waiting room when you enter, no privacy at all.	ED *r*=0.34
	I waited over two hours for a general check-up despite having an appointment. Understaffed. Poor communication.	UCC *r*=0.37
Telephone experience	I called to ask a question and was transferred to the [ED] nursing station where a male nurse answered the phone, sighed several times, treated me like I was his biggest problem, and hung up on me mid-sentence.	ED *r*=0.29
	They will not answer my calls[;] left a message with my phone number and never called back[;] poor customer service.	UCC *r*=0.29
Waiting	Left the [ED] unseen after three and a half hour wait. Only other person beside me in waiting room left at same time, they'd been waiting five hours. What a joke....	ED *r*=0.23
	It's ridiculous to wait 1hr 23mins to see a doctor for 2mins and there [were] only 4 people ahead of me.	UCC *r*=0.20
Billing or insurance	Billing is outrageous, they send me a bill for almost $5000 dollars for one [ED] visit, $2300 for using an [ED] room for freakin less than an hour, and $1500 for an ultrasound!!!	ED *r*=0.19
	Very good service but lousy billing. The full amount was charged to my credit card before I could set up a payment plan!	UCC *r*=0.25
Pain management	Had to wait 2 hours at the [ED] in extreme pain...[and the] nurses were not acknowledging. Worst experience ever.	ED *r*=0.23
	My first time here and this place is disgusting and unprofessional.... The medical assistant was eating Cheetos and rubbed it off her scrubs[,] NOT WASHING HER HANDS before taking my temperature and blood pressure.	UCC *r*=0.23
Diagnostic testing	Do not go here if you have an emergency. Triage was quick but the rest of the care was very slow even though the [ED] was empty that morning. There were four different nurses who came in and kept passing the job of taking blood. They were nervous to draw blood—doesn[']t inspire confidence in patients. They ran lab tests and did not give me any results.	ED *r*=0.16
	Terrible experience. Misread test results.	UCC *r*=0.19

UCC, Urgent care center.

and 30% urgent care center). Overall, urgent care centers are rated higher than EDs. That difference may be understandable, given that individuals who use EDs and urgent care centers likely differ, along with their conditions

and expectations. However, analysis of reviews in these overlapping clinical settings reflect patient expectations and how they align with experiences. As patients continue to review health care services on platforms such as Yelp, it is

Table 2. Unique themes in reviews of ED and urgent care centers.

ED: 5-star themes	Sample Narrative Text
Bedside manner	"[M]y…doctor was wonderful, great bedside manner and very informative. The staff also, very courteous and attentive… Cudos [sic]! Much better than our last two…previous visits some years ago!"
Care for family member	"Took mom to the emergency room…. [T]hey are great…. [F]ixing mom up right now with her blood pressure…. [E]veryone is top notch!!!"
Access to care on nights or weekends	"Gotta love late night [ED] trips. Great staff! Took us right away [with] no waiting!"
ED: 1-star themes	**Sample Narrative Text**
Overall service	"The employees who were working in the [ED] at the time were very rude and the facilities were disgusting. All over the [ED], there were dirty gloves and paper towels thrown on the floor. Nobody who worked there seemed to care. The nurses are also unprofessional."
Overall speed of care	"Slowest [ED] in the area. There is not one ounce of hurry in any of them. A simple issue can take hours. Fumming [sic]!"
UCC: 5-star themes	**Sample Narrative Text**
Recommendation	"Very good experience. I went to the recommended location[;] very short wait[;] staff was very friendly and professional."
Prescription and pharmacy	"I was seen by a doctor and my script was filled in less than an hour. Thank you minute clinic!"
UCC: 1-star themes	**Sample Narrative Text**
Lack of confidence	"Awfulllllll[!] [S]taff is incompetent[;] managers are incompetent and lack time management skills."
Reception	"It would make my experience a whole lot better if the front desk lady wasn't so rude every time."

also interesting to think about how these results are displayed to the general public. Yelp reports an average rating, whereas Press Ganey conducts and reports top-box analyses that can be compared with similar hospitals or services. Each report can provide valuable information to consumers and health care providers, and Yelp and Press Ganey could learn from each other.

Third, reviews reveal themes that are at times similar across EDs and urgent care centers and at times unique. These similarities and differences indeed provide insights that may improve patient experiences or align them with expectations. For example, although there are counterexamples, positive reviews of ED care mostly emphasized clinical quality and negative reviews mostly emphasized service. Positive reviews of urgent care center care mostly emphasized service and negative reviews mostly emphasized quality.

Online rating platforms such as Yelp provide a window into patient experiences and provide a means for understanding patient expectations in these complementary but very different health care services and settings. This study reveals a novel approach and opportunity to gain insights directly from patients. Although the populations using urgent care centers and EDs may be wholly different, Yelp reviews may offer a means for each to learn from the other. Although patients treated in EDs may be asked to complete standardized surveys, no similar patient experience survey exists for urgent care centers. Thus, whereas Yelp reviews may

supplement the evaluation of ED patient experience, they may be essential to evaluate the urgent care center experience. Furthermore, despite lower clinical volumes, there were more reviews per urgent care center, which suggests that patients are more apt to review an urgent care center compared with an ED.

Some aspects of the ED experience associated with improved patient satisfaction include shorter wait times,[24-26] understanding of provider roles,[24] effective pain management,[27] ED fast track,[28] interventions for increased patient privacy,[29,30] and better communication between patient and provider.[31-33] Several studies have also evaluated why patients use ED services under nonemergency conditions. Sixty-six percent of patients stated that the ED was the only place they knew to go to for their present medical problem, and 27% stated that they went to the ED for all medical care.[34] Other studies have reported that patients primarily choose ED care because of worrisome pain or discomfort as an alternative to primary care after hours, perceived unavailability of timely primary care appointments, or the perception of ED facilities and services as a "one-stop" health care site.[35] Settings with high urgent care center use correspond to lower ED and physician office use,[36] an argument often used for increasing access to and awareness of urgent care centers.[37] Although there are fewer systematic assessments of patients' perceptions of urgent care centers, Yelp reviews reveal themes unique to urgent care centers and EDs or similar between them.

Patients are posting Yelp reviews concerning their care in EDs and urgent care centers. The Yelp reviews patients leave about ED and urgent care center care reveal both distinct and overlapping elements of their expectations and trade-offs between perceived clinical and service delivery. Although in general strengths in ED and urgent care center reviews suggest patients perceive better clinical care in EDs and service in urgent care centers, the deficiencies in these reviews suggest they expect both elements from both settings. Lessons learned from patient reviews in these clinical settings may help improve care delivery and the patient experience as the acute care markets emerge, grow, and change.

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