ORIGINAL RESEARCH

Exploring Real-time Patient Decision-making for Acute Care: A Pilot Study

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Introduction: Research has described emergency department (ED) use patterns in detail. However, evidence is lacking on how, at the time a decision is made, patients decide if healthcare is required or where to seek care.

Methods: Using community-based participatory research methods, we conducted a mixed-methods descriptive pilot study. Due to the exploratory, hypothesis-generating nature of this research, we did not perform power calculations, and financial constraints only allowed for 20 participants. Hypothetical vignettes for the 10 most common low acuity primary care complaints (cough, sore throat, back pain, etc.) were texted to patients twice daily over six weeks, none designed to influence the patient's decision to seek care. We conducted focus groups to gain contextual information about participant decision-making. Descriptive statistics summarized responses to texts for each scenario. Qualitative analysis of open-ended text message responses and focus group discussions identified themes associated with decision-making for acute care needs.

Results: We received text survey responses from 18/20 recruited participants who responded to 72% (1092/1512) of the texted vignettes. In 48% of the vignettes, participants reported they would do nothing, for 34% of the vignettes participants reported they would seek care with a primary care provider, and 18% of responses reported they would seek ED care. Participants were not more likely to visit an ED during "off-hours." Our qualitative findings showed: 1) patients don't understand when care is needed; 2) patients don't understand where they should seek care.

Conclusion: Participants were unclear when or where to seek care for common acute health problems, suggesting a need for patient education. Similar research is necessary in different populations and regarding the role of urgent care in acute care delivery. [West J Emerg Med. 2014;15(6):675-681]

INTRODUCTION

The emergency department (ED) is increasingly the healthcare setting where patients seek acute unscheduled care,[1] with visits outpacing population growth, especially among disadvantaged populations.[2] Expanding insurance coverage with healthcare reform will likely further increase this

trend.[3] However, nearly all of the information regarding ED utilization is gathered from patients in the ED itself or from administrative data related to ED visits.[4-8] We know patients perceive acute care differently than providers,[9] but our lack of knowledge regarding patients' real-time decision-making makes it difficult to best meet their needs. This is particularly salient when discussing acute care needs of low-income populations who use the ED at higher rates than others.[5]

Community-based participatory research (CBPR) has been suggested as a strategy to improve the health and well-being of communities and eliminate health disparities.[10] CBPR represents a potentially useful strategy to understand populations known to be frequent ED users and collecting real-time patient data could help inform efforts to improve acute care. Since 80% of adults in the U.S. send text messages, this presents one promising option to gather information in the context of a patient's usual life, prior to seeking acute care.[11-13]

The objectives of this pilot study were to: 1) understand when participants decide if healthcare is needed, primarily for low-acuity conditions; 2) describe where patients choose to seek care for different conditions; 3) examine factors influencing decision-making; and 4) examine how preferences and perceptions influence decision-making.

METHODS

We used a community-based participatory research (CBPR) strategy to conduct a mixed methods evaluation of real-time patient decision-making for common acute conditions. We formed a steering committee comprised of University of Michigan researchers, a member of the "Villages of Parkside" (TVP), an urban, government-subsidized community, and a representative of Friends of Parkside (FOP), a non-profit community organization affiliated with TVP. The steering committee guided the research project from inception to completion and met on a regular basis to design and plan the study, recruit and enroll participants, discuss data collection and assess results. The University of Michigan researchers conducted data analysis, with frequent meetings with the full steering committee to discuss the presentation and interpretation of results. Key principles of CBPR emphasizing equal partnership between all members and building capacity within communities guided this study.[10,14] Our mixed methods approach was designed to use quantitative data to inform our focus group discussion guide and assist in analyzing our qualitative findings consistent with the "following a thread" strategy.[15,16]

Participants were recruited by FOP by texting TVP members through a previously established database of cell phone numbers, distribution of flyers and word-of-mouth referrals. Only adults affiliated with TVP who had a primary care provider and text-messaging capabilities were eligible for participation. Two recruitment meetings were held by researchers to explain the study, collect demographic information, and obtain written informed consent. Due to the

exploratory, hypothesis-generating nature of this research, we did not perform power calculations, and financial constraints only allowed for 20 participants.

We created ten hypothetical acute care vignettes, patterned after the ten most common acute care complaints seen in U.S. primary care clinics.[17] Each vignette was designed to be texted to participants (e.g., "You've had a sore throat for 4 days and feel sick"). To assess the proportion of participants who would pursue care and where they would seek it, participants were asked to respond "ER" if they would seek care in the ED, "MD" if they would seek recommendations from their primary care provider (PCP), or "Nothing" if they would not seek care. Additionally, each participant was instructed to give a brief explanation of why s/he chose that response. To control for possible automated responses to our texts, we sent four anchoring vignettes: two designed to prompt an ED visit (stroke and severe trauma), and two designed to prompt a PCP visit (vaccination and nevus evaluation). We sent each participant two text messages per day over six weeks. Questions were sent at different times of day and categorized as either regular PCP "on hours" (Monday-Friday 8:00 AM to 5:00 PM) or "off hours" (Monday-Friday 5:00 PM-10:00 PM, Saturdays and Sundays). Participants were paid $1 for responding ER, MD or nothing to each text and another $1 for texting a brief explanation. Table 2 displays all of the vignettes texted to participants.

We used a focus group to understand survey responses and better comprehend the decision-making process for acute conditions. All participants were invited and encouraged to participate in the focus group. The focus group was led by a moderator (AS) and facilitated by an assistant moderator (WG), audio recorded and transcribed.[18,19] We designed an interview guide to help moderators explore: 1) how participants decide if healthcare is needed; 2) how participants decide where to seek healthcare; 3) factors influencing decision-making; and 4) how preferences and perceptions of the ED and PCP clinic influence decisions (Appendix).

The focus group was transcribed verbatim by a professional transcriptionist and reviewed for accuracy. We used inductive qualitative techniques informed by thematic analysis.[18,19] Transcripts were reviewed line by line to identify prominent concepts and ideas to draft preliminary coding categories. These initial findings were reviewed, coding categories were created, and themes were added and clarified as a team. Four researchers (TC, EC, WG, AS) engaged in an inductive process of reading and manually coding the transcript. Codes were further clarified and a codebook with definitions was developed.

The full steering committee reviewed results in frequent meetings and discussions, using memos to identify emerging themes and describe relationships among coding categories. The final coding scheme and analysis of the findings were reviewed, and disagreements were discussed until consensus was reached. We organized the results using the coding

Table 1. Study population, n=20.

Ages (years)	
Range	19 - 62
Average	34.3
Females	17 (85%)
Race/ethnicity	
Black	20 (100%)
Education	
<High school	4 (20%)
High school equivalent (GED)	2 (10%)
High school graduate	1 (5%)
Some college	11 (55%)
College graduate	2 (10%)
Work status	
Student	4 (20%)
Employed	7 (35%)
Unemployed	9 (45%)
Insurance	
Medicaid	12 (60%)
Private	5 (25%)
No insurance	3 (15%)
Primary care physician visits/year	
0	4 (20%)
1 to 10	12 (60%)
11 to 20	3 (15%)
>20	1 (5%)
Emergency department visits/year	
0	8 (40%)
1 to 5	11 (55%)
6 to 10	1 (5%)

scheme structure and illustrated the themes with representative quotations. To increase the validity of our qualitative data, we performed "member checking" where the overall results of the study were presented to participants. Each participant indicated that the results included and accurately represented their viewpoints.

RESULTS

Our sample (n=20) comprised primarily of African American women (85%) and Medicaid recipients (60%), the majority of whom had visited the ED in the last 12 months (Table 1). We received text survey responses from 18/20 recruited participants, as two lost cell phone service prior to the beginning of our data collection. We received responses for 72% of our text message vignettes with a similar proportion of responses sent "on hours" and "off hours." Most commonly participants chose "nothing" (48% of vignettes) indicating they would not have sought care for the

hypothetical text scenarios, next most often they would have sought primary care (34%) and less frequently (18%) ED care (Table 2). This did not differ when stratified by time of day; in fact, more participants responded they would have sought ED care during "on hours" compared to "off hours."

Twelve of our participants contributed in the focus group. Five general themes were identified through inductive analysis of the focus group and assessment of open-ended text responses (Table 3). These themes helped us to understand how participants decide if care is needed and where to seek it when necessary. It became clear through our text responses and focus group discussion that participants were not confident when they should seek medical care.

Participants considered the severity and length of symptoms to be the primary factors driving the need to seek care, but did not mention the types of symptoms as a key reason to receive medical evaluation. For example, one participant stated:

> "If you were sick, like you really, really can't take it, then you go; other than that it's home remedies."

After deciding to seek care, participants were unclear where they should seek evaluation. As one participant noted: "... it's hard to tell… a lot of people don't know." They preferred seeing a physician with whom they had an established relationship, but reported difficulty arranging PCP appointments.

Participants perceived the ED as overcrowded, expensive and a venue for over-testing, stating:

> "When you go to emergency, you get chest x-ray; you get CAT scan, you get all of that and you still get no solution. And then you get this bill."

Participants also felt ED providers did not offer the time and attention they desired, by expressing:

> "You're there like three, four, five hours and then you go in there, they check you out for like two minutes and then you have been there for five hours to get a two minute result and they send you home."

Though our study was not designed to assess urgent care centers, participants continually brought up this option for acute care. Overall, urgent care centers, while not specifically defined by participants, were described as sites of care not affiliated with a hospital or a PCP clinic and were perceived positively. Participants felt urgent care centers were more accessible than their PCP and had more predictable wait times than the ED, which translated into more time spent with the provider.

DISCUSSION

Our pilot study helps to understand how patients assess the need for care and where they choose to seek it. Participants were unable to define clear indications to seek care at an ED, with the exception of severe trauma. We found participants were more likely to stay home or seek care from a PCP, even during "off-hours," than to seek ED care. The

Table 2: Hypothetical low-acuity vignettes texted to participants. Responses are stratifed by those who would choose to seek emergency department care (ED), primary care evaluation (PCP) or no care. Proportions may exceed 100% due to rounding.

	ED	PCP	No care
10 common low-acuity medical scenarios			
Your stomach has been hurting since last night. You threw up twice today.	4 (5%)	18 (23%)	57 (72%)
You've had a sore throat for 4 days and feel sick.	12 (15%)	34 (42%)	36 (44%)
You've felt sick and had a fever for two days.	22 (27%)	22 (27%)	38 (46%)
You've had a cough, runny nose and headache for 3 days.	8 (10%)	20 (26%)	49 (64%)
You've had a throbbing headache for 3 hours.	9 (10%)	5 (5%)	78 (85%)
You have a red itchy rash on your legs, it has been there for 4 days.	10 (14%)	38 (52%)	25 (34%)
You hurt your back picking up a child 2 days ago and it still hurts to move.	18 (23%)	23 (30%)	36 (47%)
You slipped walking up the stairs and injured your knee. It is swollen and painful to walk.	38 (49%)	15 (20%)	24 (31%)
You've had a runny nose for 5 days and now your right ear is hurting.	11 (15%)	49 (65%)	15 (20%)
You slipped in the bathroom, injured your back, it hurts to lie down and when you bend over or twist.	12 (17%)	44 (62%)	15 (21%)
All low-acuity scenarios	144 (18%)	268 (34%)	373 (48%)
Scenarios designed to prompt a PCP visit			
You need a flu shot for your new job.	7 (9%)	65 (82%)	7 (9%)
You have had a mole on your leg for 10 years and are now concerned it needs to be evaluated.	7 (9%)	45 (56%)	29 (36%)
All PCP scenarios	14 (9%)	110 (69%)	36 (23%)
Scenarios designed to prompt an ED visit			
All of a sudden you can't move your right arm or leg and you can't speak normally.	72 (94%)	2 (3%)	3 (4%)
You fell down the stairs your head is bleeding, you are confused and you can tell your leg is broken.	60 (98%)	1 (2%)	0 (0%)
All ED scenarios	132 (96%)	3 (2%)	3 (2%)

majority of research and discussion surrounding ED utilization emphasizes who should *not* be there, but does not clarify who should. Our study identifies a lack of clarity on the part of patients regarding when to seek care and where to receive it. These findings are consistent with previous studies showing many patients seek ED services for conditions that could be treated in other settings.[20]

Contrary to previous studies, our participants were not more likely to seek medical care based on the time of day[21] and did not seek ED care more often during "off-hours."[22] This may be a result of our real-time data collection method, demonstrating that time of day played less of a role than other considerations when deciding where to seek care. Also, though our study was not designed to evaluate urgent care centers, it became apparent that our participants preferred this site of care to the ED and a PCP clinic for common low-acuity conditions.

Our pilot project also demonstrates text messaging as a feasible and acceptable alternative to paper surveys, especially appropriate in understanding real time decision-making. Text messaging during random times of the day and evening might more closely simulate subject responses to sudden unexpected events, such as an illness or injury. This method may therefore better reflect the decision whether and how to seek medical care under real-life circumstances, than a paper survey in a quiet environment at an expected time.

More research is needed to understand if our findings hold true in other populations, but based on our results, emergency medicine has an opportunity to identify and establish clear indications for patients to seek care in an ED. Once a consensus is reached, this information can be disseminated to communities and patients to help them understand when acute care is needed in an ED versus another setting. It has been suggested that solutions may be best found looking at system failures instead of patient factors.[23] Therefore, collaborating with other specialties, policy makers and administrators may be necessary to clarify the role of the ED in the broader health system. Additionally, the role of urgent care clinics requires further evaluation and strategic planning to optimize our ability to care for common acute conditions. Lastly, despite the trend of increasing ED use, even patients known as frequent users of the ED may have an unfavorable impression of emergency department services; this requires future inquiry and understanding.

Table 3: Focus group themes with representative quotes to understand how patients decide if care is needed and where to seek it.

Themes	Representative quotes
Factors impacting the decision to seek care	"If you were sick, like you really, really can't take it, then you go; other than that it's home remedies."
	"Some of them try to be strong and with religion and stuff like that."
	"I decide by the length of time that I'm sick and if I keep taking the over the counter medicines and if it keeps coming back, then I will go."
	"But if I don't know, then I want to go to the place that I have the most confidence in which, if I have a good MD, then it would probably be there but the ER would be next because they have more medical doctors on hand."
	"I want you [the doctor] to tell me what is really going on with me. ...Just tell me what's really wrong and help me to fix the problem."
	"You know, a lot of time the cost plays a big factor whether you go to either place."
	"That plays a lot because you won't go to no hospital because you don't got the money."
	"...it matters and if you don't got no insurance or if you've got a copay and all that because everybody don't have like $75 or $25..."
Identifying an emergency	"...if somebody came in and got shot in the neck 20 times."
	"Like you broke something; you've got a bone sticking out of your arm."
	"...you have a seizure and you wake up and you don't know where you at, stuff like that. Then you would go to the hospital."
	"...if you fell down and your head is bleeding or something and you're going to go to the hospital and do something about that"
	"...but it's hard to tell when you got broken bones because a lot of people don't know."
Perceptions of sites of care	*PCP*
	"I would prefer to go to my physician but a lot of times when I am ill you will call them and they will say, well, I can't see you for two or three days "
	"...I prefer to go to my MD because they know me and they have my records."
	"I had the hardest time getting in there but now that I'm in, it's so good because they take care of everything...But it's hard getting in there. I had to know somebody who knew somebody who knew somebody on the inside."
	ED
	"Like I guess you fear death or something like that, you know, in hospitals."
	"That's why people don't like to waste their time because you're there like three, four, five hours and then you go in there they check you out for like two minutes and then you have been there for five hours to get a two minute result and they send you home."

Table 3. Continued.

	"...but if you're not feeling well you don't want to go to emergency knowing you will be there for four hours before someone can see you."
	"When you go to emergency, you get chest radiographs; you get CAT scan, you get all of that and you still get no solution. And then you get this bill."
	"Well, if we go to emergency—from my experience, they are going to run all types of tests."
	Urgent Care
	"...but if you can't get in your clinic because you don't have an appointment, then, you know, we would just wait until after the five because 1) it's closer and 2) we couldn't get to our clinic."
	"At the urgent care I think they give you more time and they are more prone to do like real life suggestions because they don't want you to keep having to come back."
	"…I will drive to Detroit to go to the same urgent care because I know my needs are going to be met. I'm not going to get all these prescriptions; I'm going to pay my one copay..."
Priorities to improve acute health care	"I would say the number one thing is being able to get the same treatment no matter what kind of insurance you got or if you have no insurance at all. Being able to get the same thing as the person who got Blue Cross and Blue Shield and you got Medicaid."
	"…a good doctor that will care about you instead of what insurance you have."
	"Give me a good MD that I can go see and not just to treat me but can treat my whole family."
	"So if my MD had better hours and later times for walk ins and stuff like that, I think that would be—it would make me go there because he know my medical history and can better diagnose me and my son."
	"And some of the transportation, you do have to call two or three days in advance like to make an appointment. But if you are sick then, you know…"
Difficulty navigating system	"Some hospitals won't share their xrays and records of that patient with another hospital."
	"They did all the radiographs and then sent him over to Saint John's over here and they did the same radiographs."
	"...I write the check for the copay. So we end up having to be transferred to another hospital that took care of pediatrics and I got another bill for…another copay."
	"So it's like I am doing a circle to find the right person to go to. And I'm getting told to go this place while actually I'm supposed to be at this place. And this place is sending me back to the other place but the other place is not letting you in the door. So it's a big circle. Nobody knows who you are supposed to go see."

PCP, primary care provider; *ED*, Emergency Department

LIMITATIONS

Similar to any small study, the findings from our pilot study may not generalize to other communities and populations. Our findings need to be confirmed in different populations with larger samples. We used hypothetical vignettes to understand participant decision-making and it is possible that participants' actual behavior could differ from their responses. Our study also used very brief hypothetical clinical vignettes, which may make it difficult to determine the seriousness of symptoms. Similarly, we did not send text messages between 10PM and 8AM because our community partners felt this would not be well received by participants

and text messages would likely not receive a response during these hours. Therefore, our study does not address behaviors regarding acute care visits during these times.

CONCLUSION

In our sample, participants were unclear when or where to seek care for common acute health problems, suggesting a need for future research and patient education regarding this matter. Our participants preferred the urgent care over going to the ED or PCP, and there is a need for a greater understanding of the role of the urgent care in acute care delivery.

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REFERENCES

1. Pitts SR, Carrier ER, Rich EC, et al. Where Americans get acute care: increasingly, it's not at their doctor's office. *Health Affair.* Sep 2010;29(9):1620-1629.

2. Tang N, Stein J, Hsia RY, et al. Trends and characteristics of US emergency department visits, 1997-2007. *JAMA.* 2010;304(6):664-670.

3. Smulowitz PB, Lipton R, Wharam JF, et al. Emergency department utilization after the implementation of Massachusetts health reform. *Ann Emerg Med.* Sep 2011;58(3):225-234 e221.

4. Northington WE, Brice JH, Zou B. Use of an emergency department by nonurgent patients. *Am J Emerg Med.* 2005;23(2):131-137.

5. Cunningham PJ. What accounts for differences in the use of hospital emergency departments across US communities? *Health Affair.* Sep-Oct 2006;25(5):W324-W336.

6. Ragin DF, Hwang U, Cydulka RK, et al. Reasons for using the emergency department: Results of the EMPATH Study. *Acad Emerg Med.* Dec 2005;12(12):1158-1166.

7. Guttman N, Zimmerman DR, Nelson MS. The many faces of access: reasons for medically nonurgent emergency department visits. *J Health Polit Policy Law.* 2003;28(6):1089-1120.

8. Young GP, Wagner MB, Kellermann AL, et al. Ambulatory visits to hospital emergency departments - Patterns and reasons for use. *JAMA.* 1996;276(6):460-465.

9. Langdorf MI, Bearie BJ, Kazzi AA, et al. Patients' vs. Physicians' Assessments of Emergencies: The Prudent Layperson Standard. *Cal J Emerg Med.* 2003;4(4):75-81.

10. Israel BA. *Methods in community-based participatory research for health.* 1st ed. San Francisco, CA: Jossey-Bass; 2005.

11. Pew Research Center. Cell Phone Activities 2012. 2012; Available at: http://pewinternet.org/~/media//Files/Reports/2012/PIP_CellActivities_11.25.pdf. Accessed March 4, 2013, 2013.

12. Kew S. Text messaging: an innovative method of data collection in medical research. *BMC Res Notes.* 2010;3:342.

13. Anhoj J, Moldrup C. Feasibility of collecting diary data from asthma patients through mobile phones and SMS (short message service): response rate analysis and focus group evaluation from a pilot study. *J Med Internet Res.* 2004;6(4):e42.

14. Israel BA, Parker EA, Rowe Z, et al. Community-based participatory research: lessons learned from the Centers for Children's Environmental Health and Disease Prevention Research. *Environ Health Perspect.* 2005;113(10):1463-1471.

15. O'Cathain A, Murphy E, Nicholl J. Three techniques for integrating data in mixed methods studies. *Bmj.* 2010;341:c4587.

16. Creswell JW. *Research design : qualitative, quantitative, and mixed methods approaches.* 3rd ed. Thousand Oaks, Calif.: Sage Publications; 2009.

17. Centers for Disease Control and Prevention. National Hospital Ambulatory Medical Care Survey: 2009 Outpatient Department Summary Tables. 2009; Available at: http://www.cdc.gov/nchs/data/ahcd/nhamcs_outpatient/2009_opd_web_tables.pdf. Accessed May 5, 2013.

18. Kitzinger J. Qualitative research. Introducing focus groups. *Bmj.* 1995;311(7000):299-302.

19. Powell RA, Single HM. Focus groups. *Int J Qual Health Care.* 1996;8(5):499-504.

20. Oster A, Bindman AB. Emergency department visits for ambulatory care sensitive conditions: insights into preventable hospitalizations. *Medical care.* 2003;41(2):198-207.

21. DeLia D, Cantor JC, Brownlee S, et al. Patient preference for emergency care: can and should it be changed? *Med Care Res Rev.* 2012;69(3):277-293.

22. Ginde RM CR, Kirzinger WK. Emergency room use among adults aged 18-64: Early release of estimates from the National Health Interview Survey. *National Center for Health Statistics.* 2012. Available at: http://www.cdc.gov/nchs/nhis/releases.htm. Accessed May 20, 2013.

23. Lowe RA, Localio AR, Schwarz DF, et al. Association between primary care practice characteristics and emergency department use in a medicaid managed care organization. *Medical care.* Aug 2005;43(8):792-800.