

RESEARCH REPORTS

A SURVEY OF PATIENT UTILIZATION AND TRUST OF EMERGENCY MEDICAL SERVICES

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ABSTRACT

Little is understood regarding a patient's decision to go to the Emergency Department via Emergency Medical Services (EMS) versus a privately owned vehicle (POV). No studies exist evaluating patients' trust of the EMS system as related to patient race. Patients completed a multi-method survey during their ED stay. Quantitative data included: patient demographics (age, gender, race) income, insurance status, previous medical training, highest level of education, self-reported medical and social history, number of ED visits in the past three months, and two scales assessing trust and empathy: the Group-Based Medical Mistrust Scale and the Jefferson Scale. Patient characteristics were shown. A Wilcoxon signed rank test described differences in trust scales by race. Logistic regression showed factors influencing EMS utilization. Qualitative comments described patients' rationale for EMS versus POV. 23/72 (31.94%) patients utilized EMS transport and 49/72 (68.06%) utilized POV. 59.09% of patients self-identified as Black and 40.91% self-identified as White. The Group-Based Medical Mistrust Scale found Black patients had less trust in the EMS system ($p=0.0001$), while the Jefferson Scale of Patient Perception of Physician Empathy showed no significant difference in patient perceptions of EMS provider empathy ($p=0.608$). Patients who arrived via POV reported using marijuana, an illicit substance in the state of this study, more frequently than those who arrived by EMS ($p = 0.01$). Logistic regression indicated that age predicted the use of EMS over POV ($p<0.001$). Qualitative results indicated that lack of access to POV, physical limitations, cost, speed, perception of emergency, and fear were identified as reasons that support patients' decision to use EMS or POV. Triangulating the results, this study highlights that those factors in addition to trust, age, and social and economic factors likely impacted utilization of EMS. These findings could inform policy decisions and ensure emergency care systems that are accessible for all patients.

INTRODUCTION

Each year, approximately 130 million patients visit emergency departments (ED) in the United States (Cairns et al., 2022). Of those visits, about 18% are transported to the ED via emergency medical services (EMS) (Peters et al., 2023). Other patients may arrive via a privately owned vehicle (POV), taxi/rideshare, bus, or by foot. Little qualitative data exist about what factors inform

a patient's decision to utilize EMS versus POV. Although it may seem obvious to call EMS for higher acuity conditions, previous findings suggest that many factors contribute to the decision (Meisel et al., 2011; Shekhar & Blumen, 2021). Existing studies describe the frequent use of EMS by patients with lower acuity conditions; however, many patients with high acuity conditions do not utilize EMS. For example, less than half of all patients with a myocardial infarction arrive at the ED via EMS (Canto et al., 2002). Certainly, patients, who mostly do not have a medical background, may not have insight into the acuity of their own condition.

However, alternative factors – other than patient acuity - may also influence patient decisions to call EMS. Other studies have shown correlation between patient level factors and decision to use EMS. Patients with private insurance are less likely to arrive by EMS than patients with Medicaid or those without health insurance (Ward et al., 2023). Additionally, one-third of patients over the age of 60 arrive by ambulance and this association increases with each decade of age (Ashman et al., 2020). Previous studies have shown that a patient's age and insurance status correlate with EMS utilization, but we do not know whether a patient's race is a factor in one's decision to utilize EMS or whether race impacts trust of the EMS system. We also do not have insight into patient understanding of when it might be appropriate to utilize EMS. Given that no prior study has directly explored the patient's decision-making process around the decision to call EMS, we lack the information necessary to ensure all patients have equitable access to ED care. The aim of this study was to better understand patients' decision to use EMS or POV by triangulating with reference to 1) open ended questions around the decision to utilize EMS and 2) responses to a survey assessing race-based trust of EMS.

METHODS

STUDY DESIGN

This study used survey design methodology to examine factors that influence patients' ED transportation decisions. A multi-method survey was administered to a random sample of ED patients during their stay over a three-month period (June 2022 to August 2022). Data were collected during weekday daytime hours by one trained medical student (AL). Open-ended questions elucidated patient reasoning for utilizing EMS versus POV. In the survey, patients were also asked their race, ethnicity, income, insurance status, medical history, and substance abuse history. Additionally, we reviewed in-hospital charts of all patients who took the survey to collect chief complaint, patient age, patient gender, patient disposition, and number of ED visits within the 3 months prior to enrollment.

For patients that arrived to the ED via EMS, we also administered two scales to assess trust and perceived empathy of EMS providers: the Group-Based Medical Mistrust Scale (GBMMS) (Thompson et al., 2004) and the Jefferson Scale of Patient Perception of Physician Empathy (JSPPPE) (Hojat et al., 2017). Both were five-point Likert scales validated in the hospital setting and modified to be applicable to EMS. The adapted GBMMS used included 7 race-based medical mistrust questions. The adapted JSPPPE we included 5 questions. In the GBMMS, a higher score is associated with a higher level of mistrust (Appendix A). Previous studies of this scale have demonstrated strong validity and reliability ($\alpha = 8.7-8.9$) (Shelton et al., 2010). In the JSPPPE, a higher score indicates a higher patient

perception of EMS empathy (Appendix B). This scale has also been validated in previous studies, in which Cronbach's α was between 0.81 and 0.88 (Domingues et al., 2019).

For the qualitative portion of the survey, patients transported via EMS were asked ten questions about their decision to utilize EMS as well as their overall patient encounter experience. These open-ended questions were asked orally with answers recorded in Qualtrics using an iPad (Appendix C). After the oral portion was completed, patients were given the iPad to answer the remainder of the qualitative survey privately because it contained potentially sensitive content that they might not feel comfortable answering aloud. Patients completed the surveys in English and were provided the option to respond to these questions orally.

STUDY SETTING AND POPULATION

One trained medical student (AL), a Caucasian female, approached a convenience sample of adult patients in the ED who met inclusion criteria (≥ 18 years of age), agnostic to chief complaint and triage data, and invited them to participate in the survey. For those who were interested in participating, informed consent was obtained. Patients were excluded for altered mental status or inability to provide informed consent. Patients were also excluded if someone else made the decision for the patient to go to the hospital (e.g., if another person called EMS without patient input). Efforts were made to assure equal representation among patients triaged to the different locations of the ED (low and high acuity areas), however it must be noted that with the above exclusion criteria and fact that survey was only administered in the ED and not to the subset of patients who may have presented via EMS but went rapidly to other hospital areas (e.g. surgery, cath lab, etc), acutely ill patients were likely to be underrepresented.

The study took place at a large, tertiary care ED in Indiana, United States with an annual patient volume of 100,000 per year, of which about 33,000 arrive to the ED via EMS. The surrounding county is home to a population of 971,102, of which is 52% is female. 11% of the population was Hispanic; the racial breakdown was 62% White, 30% Black, 4% Asian, and 4% mixed or other races (Bureau, 2020). Median per capita income is \$30,013 and over 14% of the population lives in poverty (Bureau, 2020). The self-reported demographics for the workforce of the largest EMS agency serving the jurisdiction in which the study took place included 385 employees with an average age of 35 years old, 42% female, 83% white/not Hispanic, 8% black, 9% other.

DATA ANALYSIS

The primary purpose was to identify factors that explain patients' decisions surrounding EMS utilization. Secondary purposes included testing for differences in EMS utilization based on race and other patient demographic characteristics, and for those that utilized EMS for transport, examining whether there exist differences in trust and empathy as measured by the adapted GBMMS and JSPPPE scales.

We stratified patients by mode of transport (EMS vs POV) and described patient demographics, self-reported medical and social histories, and ED utilization (based on chart review) for a three-month period. We performed a logistic regression to compare the odds of being transported to the ED by EMS compared to POV. For patients who present-

ed via EMS, we also used a Wilcoxon signed rank test to compare EMS trust responses by race.

We used thematic analysis to analyze the qualitative survey data. This process included familiarizing ourselves with the data, categorizing the data, and creating descriptive summaries (Braun & Clarke, 2006). One medical student (AL) read all the data line-by-line and noted interesting comments. She then observed how these comments fit together into six categories. The analytic team consisted of a medical student without an EMS background (AL), an Emergency Medicine physician (PM), and an EMS medical director and practicing ED physician (NG), who met every two weeks for a period of four months. Once the analysis team identified potential themes, they were presented to an Emergency Medicine non-clinical faculty with methodological expertise (SSS) for feedback and refinement. The final process named and defined these themes in order to support the creation of descriptive summaries. This study was approved by the Indiana University Institutional Review Board [Protocol #2008258080].

RESULTS

QUANTITATIVE RESULTS:

DEMOGRAPHICS, MEDICAL AND SOCIAL HISTORY

We enrolled 72 patients (Table 1) and of the patients who participated in the study, 23 arrived at the ED via EMS and 49 arrived via POV.

After performing a Bonferroni correction, where the critical p-value <0.0045 was identified for significant values, we found no significant differences between past medical history reported by patients utilizing EMS and those using POV (Table 2).

	EMS Transport (n = 23)	POV (n = 49)
Age		
Mean (SD)	59 (12.03)	44.04 (13.38)
Gender		
Female	12 (52.17%)	26 (53.06%)
Male	11 (47.8%)	23 (46.9%)
Other	0 (0.0%)	0 (0.0%)
Race		
Black	13 (59.09%)	29 (60.42%)
White	9 (40.91%)	19 (39.58%)
Other/prefer not to answer	1 (4.35%)	1 (2.04%)
Income		
<\$30,000	16 (69.57%)	23 (49.94%)
\$30,000-50,000	0 (0%)	12 (24.49%)
\$50,000-100,000	1 (4.35%)	2 (4.08%)
\$100,000+	0 (0%)	11 (22.45%)
Prefer not to answer	6 (26.09%)	1 (7.1%)
Insurance status		
Public	18 (78.26%)	34 (64.2%)
Private	3 (13.04%)	8 (16.33%)
Uninsured	1 (4.35%)	4 (10.20%)
Did not answer	1 (4.35%)	2 (4.08%)
Previous medical training?		
Yes	3 (13.04%)	10 (20.41%)
No	18 (78.26%)	39 (79.59%)
No response	2 (8.70%)	1 (2.04%)
Education		
Some high school	7 (30.43%)	5 (10.2%)
High school degree or equivalent	7 (30.43%)	20 (40.82%)
Some college	5 (21.74%)	11 (22.45%)
Associates degree	1 (4.35%)	4 (8.16%)
Bachelor's degree	0 (0%)	4 (8.16%)
Graduate/Professional degree	1 (4.35%)	2 (4.10%)
Did not answer	2 (8.70%)	3 (6.1%)
Number of ED visits in past 3 months		
Mean (IQR)	1.26 (1.96)	.69 (1.90)
Median	0	0

Table 1. Participant characteristics – Comparison of patients who presented by EMS versus POV.

	EMS Transport (n=23)	POV (n=49)	p-value*
Asthma, emphysema, or chronic bronchitis	10 (45.45%)	14 (29.17%)	0.21
Black	6	7	
White	4	7	
Other/prefer not to answer	0	0	
High blood pressure or hypertension	16 (72.73%)	21 (43.75%)	0.04
Black	9	15	
White	6	6	
Other/prefer not to answer	1	0	
High blood sugar or diabetes	9 (40.91%)	9 (18.75%)	0.06
Black	5	6	
White	4	3	
Other/prefer not to answer	0	0	
Arthritis or rheumatism (inflammation of the joints)	14 (63.64%)	16 (33.33%)	0.01
Black	10	10	
White	3	6	
Other/prefer not to answer	1	0	
Angina, heart failure, or other types of heart disease	5 (22.73%)	5 (10.42%)	0.19
Black	4	4	
White	1	1	
Other/prefer not to answer	0	0	
Stroke, seizures, Parkinson’s disease, or another neurological condition	5 (22.73%)	6 (12.50%)	0.3
Black	3	5	
White	1	1	
Other/prefer not to answer	1	0	
Liver disease	1 (4.55%)	1 (2.08%)	0.58
Black	0	0	
White	1	1	
Other/prefer not to answer	0	0	
Kidney or renal disease	2 (9.09%)	3 (6.25%)	0.69
Black	1	1	
White	1	2	
Other/prefer not to answer	0	0	
Cancer diagnosed or treated in the last three years	3 (13.64%)	2 (4.17%)	0.16
Black	2	0	
White	1	2	
Other/prefer not to answer	0	0	
Anxiety or depression	9 (42.86%)	18 (37.50%)	0.84
Black	2	11	
White	7	7	
Other/prefer not to answer	0	0	

Table 2. Participant past medical history – Comparison of patients who presented by EMS versus POV using Chi-Squared test.

Patients who arrived in a POV reported using marijuana, an illicit substance in the state of this study, more frequently than those who arrived by EMS ($p = 0.01$ when $p < 0.05$ is significant) (Table 3).

	EMS Transport (n=23)	POV (n=49)	p-value*
Cigarettes	6 (28.57%)	17 (35.42%)	0.47
Black	3	10	
White	3	7	
Other/prefer not to answer	0	0	
Alcohol	2 (9.52%)	5 (10.42%)	0.84
Black	2	2	
White	0	3	
Other/prefer not to answer	0	0	
Marijuana	1 (4.76%)	17 (35.42%)	0.01
Black	0	9	
White	1	8	
Other/prefer not to answer	0	0	
Cocaine	1 (4.76%)	2 (4.17%)	0.96
Black	1	1	
White	0	1	
Other/prefer not to answer	0	0	
Heroin	0 (0.00%)	0 (0.00%)	N/A
Black	0	0	
White	0	0	
Other/prefer not to answer	0	0	

Table 3. Self-reported participant drug utilization – Comparison of patients who presented by EMS versus POV using Chi-squared test.

When comparing the odds of arriving to the ED by EMS compared to POV using logistic regression, the only significant factor identified was age. Patients older than 65 years old were more likely than younger patients to utilize EMS rather than POV ($p < 0.001$). No statistically significant difference was found for gender or race. (Table 4).

TRUST SCALES

No statistically significant differences were found in GB-MMS or JSPPE based on age greater than or less than 65 or gender. Black respondents had a higher GBMMS (indicating more mistrust), than white respondents ($p = 0.003$). However, in the JSPPE, no difference was found in response based on race (Table 5).

		Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age	(years)	1.10 (1.05-1.16)	<0.001	1.10 (1.05-1.17)	<0.001
Gender	Female (referent)				
	Male	1.04 (0.38-2.81)	0.944	0.68 (0.20-2.25)	0.54
Race	White (referent)				
	Black	0.95 (0.34-2.70)	0.916	0.88 (0.26-3.00)	0.84

Table 4. Logistic regression model estimating the odds of arriving by EMS versus POV.

QUALITATIVE FINDINGS

We identified six themes in response to open-ended questions about the decision to use EMS or POV for transportation: 1) access to POV, 2) physical limitations, 3) cost, 4) speed, 5) perception of emergency, and 6) fear. The descriptive summaries for each theme are presented below.

ACCESS TO POV

Five participants who arrived by EMS to the ED reported not owning or having access to a private vehicle. Four participants shared that they had access to a POV during certain hours, but not during others. Participants specifically described calling EMS at certain times of day when a POV was unavailable. For instance, when “it’s 5 am” participants viewed EMS as “the only way” or the “only option” to get to the ED. On the other side of this, most participants who came via POV did so because they had access to a POV and a family member was “available” or “able to drive.” Some participants described that owning a vehicle or borrowing one from a friend, family member, or neighbor factoring into their decision-making process. In fact, several participants described making contingency plans with a family member or friend to bring them to the ED in the event that their symptoms had not improved or worsened.

PHYSICAL LIMITATIONS

Twenty participants cited physical limitations as an influencing factor in their decision regarding mode of transportation. Twelve participants who arrived at the ED via EMS reported an inability to use a POV due to medical reasons such as being unable to walk, feeling weak, or being unable to navigate a home staircase. When participants described difficulty ambulating at baseline, extreme shortness of breath, or visual changes, they questioned whether it was “safe” to drive themselves and believed EMS “would know best” how to transport them to the ED.

For participants who presented via POV, eight did so because they felt confident about their ability to drive safely. One reason that some participants felt safe driving was because they lived extremely close to a hospital, thus their physical ailments did not limit their ability to drive a short distance. Finally, three participants stated that they were sent to the ED from a doctor’s appointment to which they had already driven themselves and believed they could arrive safely.

COST

The cost of EMS transport was one of the most frequently recurring themes among participants, especially those that arrived via POV. Eleven participants expressed concern about the cost of EMS care and believed that taking a car would be a “less expensive” option or that an ambulance was too expensive. Although some participants said they had insurance coverage, many did not know what the out-of-pocket cost or co-pays

	GBMMS	p-value	JSPPE	p-value
Overall	16.0 (15.0-18.0)		18.5 (16.3-20.0)	
Age				
< 65	16.0 (14.0-17.0)	0.136	19.0 (16.0-20.0)	0.945
65+	18.0 (15.5-22.5)		18.0 (17.0-20.0)	
Gender				
Male	16 (15.5-17.0)	0.437	19.0 (18.0-20.0)	0.578
Female	18 (15.0-22.5)		17.0 (14.0-20.0)	
Race				
Black	18.0 (16.0-22.0)	0.003	18.0 (16.0-20.0)	0.531
White	15.0 (13.0-15.0)		20.0 (17.0-20.0)	

Table 5. Summed trust scores by demographics.

would be, so they opted to decline using EMS rather than taking the risk of receiving a bill they could not afford to pay. Finally, some participants reported being underinsured or having no insurance and simply knew that EMS transport would not be covered.

SPEED

The speed of transport and evaluation in the ED was discussed by thirteen participants in both the EMS and POV groups. Some participants thought the ambulance would take “a long time.” Others noted being located just a few minutes from the ED, and thus, POV would be the fastest as they did not have to “wait for EMS.” Interestingly, some participants believed the opposite: that they would receive expedited medical care and would be seen faster in the ED if they came in by EMS because they would bypass the triage lines.

PERCEPTION OF EMERGENCY

Twelve participants questioned what constitutes an emergency and described how that influenced their transport decision. Some participants stated that they did not think their condition was “serious enough” or “life threatening” and, therefore, did not believe it was an emergency. A couple of participants stated that they would only utilize EMS in a “severe emergency” such as being unconscious or experiencing a traumatic injury.

FEAR

Fear as a theme was discussed in multiple ways: for the majority of participants fear was a pervasive reason to use POV. For example, some reported not wanting to come into the ED alone, so using POV ensured a family member or loved one could come too. Two participants discussed a “fear of judgment” from hospital personnel for utilizing EMS based on past experiences. And as a result, those participants decided to use POV so that they could control which ED would provide them care. One participant noted a fear around attracting the attention of his neighbors and not wanting to “make a scene,” which led to his decision to use a POV for transportation despite acknowledging that EMS transport was a medically better option.

DISCUSSION

While many studies have investigated quantitative factors correlated with high-frequency EMS utilization, to our knowledge, this is the first study to explore the decision to utilize EMS from the patient perspective, including patient factors and an exploration of the relationship between perceived trust and empathy of the 911 system, and EMS utilization.

Approximately one-third of the participants arrived via EMS. That number is higher than national data showing utilization of EMS to access emergency care, which could be due to the nature of the facility (a tertiary care hospital), or as a result of the convenience sampling. Similar to prior studies, older participants utilized EMS frequently (Duong et al., 2018), and patients often utilized EMS even when they did not perceive a threat to life, organ or body function (Agarwal, et al. 2019). Even though older adults utilized EMS more often than younger ones, we did not appreciate significant differences between past medical history reported by the two groups. This could be a limitation of self-reporting; patients may not always be aware of their medical diagnoses. However, it

is interesting to note that there was no difference between the two groups in regard to self-reported medical history. Although patients with particular medical diagnoses or with a greater number of medical diagnoses may present with higher-acuity conditions, perhaps they have also found regular transportation to meet the needs stemming from those medical diagnoses.

Patients who arrived in a POV reported using marijuana more frequently than those who arrived by EMS. Other studies have demonstrated that patients sometimes fear calling “9-1-1” to engage EMS because they are concerned that law enforcement will also show up (Sasson et al., 2015). As the study took place in a state in which marijuana is classified as an illegal substance, this could be a reason that patients who use marijuana more frequently engaged EMS less often, although it was interesting to note that we did not see the same correlation with reference to other illicit drugs. This finding could also be related to the difference in utilization based on age previously noted, as it is known that use is highest among 18- to 25-year-olds and lower in older groups (National Academies of Sciences, Engineering, and Medicine, 2017).

Self-reported race, gender, and insurance status did not vary significantly with use of EMS over POV. As we gleaned from the qualitative data, selection of EMS over POV often reflected a multitude of patient-level factors that cannot necessarily be described with quantitative data. For example, some patients worried about the cost of taking EMS because of lack of insurance, while others took EMS because they did not have a car.

As shown by GBMMS and JSPPPE scales adapted for this study, black patients were less trusting of EMS than white patients, but no difference was found in patient perception of provider empathy when stratified by patient race. Those results are similar to comparable studies in the ED setting, even though the scales were adapted here to be applied to EMS (Kline et al., 2020). Our findings may result from a lack of racial diversity in the EMS workforce. Approximately 85% of nationally certified EMS personnel identify as non-Hispanic white (Cash et al., 2022). Additionally, only 8% of employees of the largest EMS agency serving the jurisdiction self-identify as Black. It is possible that since fewer black patients receive race-concordant care, they are less likely to trust providers. Previous work has found that patients with racially or ethnically concordant clinicians were 7.5 percentage points more likely to report trust than patients with non-concordant clinicians (Greene et al., 2023). These findings also suggest that efforts should continue to identify actual and perceived differences in care of patients by race and ethnicity.

Another question we asked to better understand the patient perspective was “did you feel that you had an immediate threat to life, organ, or body function today?” We did not observe a significant difference in response to this question between those who selected POV versus EMS. Published literature varies on this topic. Some studies demonstrated the low medical acuity of patients who frequently used EMS (Billittier et al., 1996; Gardner, 1990) while another demonstrated that patients utilizing EMS required more ED resources and had longer length of stays, suggesting higher acuity (Peters et al., 2023). Still other studies have shown little agreement between healthcare workers and patients as to what constitutes an emergency or appropriate utilization of emergency services (Dejean et al., 2016; Uscher-Pines et al., 2013). It is noteworthy that despite being in an ED when queried, more than half of patients stated that they did not think their condition constituted a threat to life, organ or body function.

A prior study identified four non-medical factors that paramedics considered to be justifiable use of the ambulance: patient age, lack of knowledge of the system, lack of social support, and systemic failures (Dejean et al., 2016). Specifically, EMS providers reported they were called by patients awaiting placement in long-term care facilities and patients who were unable to move themselves (Dejean et al., 2016). Those were consistent with some of the factors our patients identified as reasons to call EMS. Our patients further cited access to a POV and cost as reasons to engage EMS or not. A significant number of patients suffer from transport insecurity (Health Research & Educational Trust, 2017) and fear of surprise bills for ambulance transport is reasonable as in 2020, the median surprise billing for ground EMS transportation was \$450 (Chhabra et al., 2020). Those factors suggest many opportunities for ways to improve access to and efficiency of our current system. For example, alternatives to EMS can appropriately address low-acuity concerns.

Another recurrent theme that presented during our study was the perception that patients had as to the speed in which EMS or POV would provide them with medical attention. Some patients came via EMS as they thought it would be faster after arrival at the hospital as they believed that presentation via ambulance would allow them to “skip” the triage line and receive medical care more rapidly. On the other hand, many of the patients who arrived at the ED in a POV stated that they did so as they thought this was the faster mode as they did not need to wait for EMS to arrive and could go directly to the ED. Previous studies find that EMS units in the United States average 7 minutes from the time of the call to the arrival on scene, however the median time increases to 14 minutes in rural environments (Borg & Mosier, 2021). Additionally, one study found that the door-to-doctor evaluation time was 5.3 minutes for patients arriving via EMS and 18.8 minutes for those coming via POV with a $p < 0.0001$ (Mell et al., 2017). This could lend credibility to the suggestion that EMS transport allows them to move ahead in the triage line but could also be related to the fact that many patients who come by ambulance are appropriately triaged to receive faster care given the acuity of their condition.

LIMITATIONS

This study is a pilot study in which the study design only captured a subset of the ED population; those too ill to be interviewed were not included and participation was voluntary. That could have created a selection bias. Although 11% of the population was Latinx and a Spanish survey was created, the findings only represent those who completed the survey in English. The study was limited to one hospital with a single catchment area and was only administered during the week. The student administering the survey was Caucasian. We attempted to limit the bias this might introduce by putting all sensitive questions into an iPad questionnaire that was administered when she had left the room. Future studies should examine the generalizability of our findings in a setting with a higher proportion of Latinx patients.

CONCLUSIONS

This study provides insight into patient decisions to utilize EMS or not, specifically identifying major themes driving the decision to select EMS or POV. It further highlights disparities in trust of the EMS system, which may impact healthcare access. It could be

used as a foundation for future studies exploring equitable access to healthcare and alternative non-emergent healthcare options.

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APPENDIX A

Adapted Group Based Medical Mistrust Scale (GBMMS). Answer choices included strongly disagree, disagree, neutral, agree, and strongly agree.

- EMS providers sometimes hide information from patients who belong to my ethnic group
- EMS providers have the best interests of people in my ethnic group in mind
- People of my ethnic group should not confide in EMS providers because it will be used against them
- People of my ethnic group should be suspicious of information from EMS providers
- People of my ethnic group cannot trust EMS providers
- People of my ethnic group should be suspicious of modern medicine
- EMS providers treat people of my ethnic group like “guinea pigs.”

APPENDIX B

Adapted Jefferson Scale of Patient Perception of Physician Empathy. Answer choices included strongly disagree, disagree, neutral, agree, and strongly agree.

- EMS providers understand my emotions, feelings, and concerns
- EMS providers seem concerned about me and my family
- EMS providers can view things from my perspective (see things as I see them).
- EMS providers ask about what is happening in my daily life.
- EMS providers are understanding

APPENDIX C

SURVEY FOR ENGLISH-SPEAKERS (QUALITATIVE QUESTIONS MARKED WITH *)

How did you get to the emergency department today?

- 9-1-1 ambulance
- Private vehicle
- Not sure

Are you the one who decided to come to the hospital today?

- Yes
- No

If you came via EMS (a 9-1-1 ambulance), was the ambulance already on scene or did someone else make the decision to contact 9-1-1?

- I contacted 9-1-1
- I asked someone to contact 9-1-1
- Someone else contacted 9-1-1 without me asking for it

Did you feel that you had an immediate threat to life, organ or body function today?

- Yes
- No

*If “no” in the above question, what caused you to call 9-1-1?

Have you used EMS in the past?

- Yes
- No

Did anyone convince you to come to the emergency department today?

- No
- Yes, a friend
- Yes, a family member
- Yes, a co-worker
- Yes, other

*Why did you choose the type of transport you used?

If you used EMS, would you be willing to use this service again?

- Yes
- No

*If you used EMS, why or why not would you be willing to use this service again?

For the following questions, please consider your experience with EMS today. (Answer choices for all were: Strongly disagree; Disagree; Neutral; Agree; Strongly Agree)

- EMS providers sometimes hide information from patients who belong to my ethnic group.
- EMS providers have the best interests of people of my ethnic group in mind.
- People of my ethnic group should not confide in EMS providers because it will be used against them.

- People of my ethnic group should be suspicious of information from EMS providers.
- People of my ethnic group cannot trust EMS providers.
- People of my ethnic group should be suspicious of modern medicine
- EMS providers treat people of my ethnic group like “guinea pigs.”

For the following questions, please consider your experience with EMS today. (Answer choices for all were: Strongly disagree; Disagree; Neutral; Agree; Strongly Agree)

- EMS providers understand my emotions, feelings, and concerns.
- EMS providers seem concerned about me and my family.
- EMS providers can view things from my perspective (see things as I see them).
- EMS providers are understanding EMS providers.

What is your ethnicity?

- Hispanic or Latino
- Not Hispanic or Latino
- Other/Prefer not to answer

What is your race?

- White or Caucasian
- Black/African American
- Asian
- Native Hawaiian or Other Pacific Islander
- Other/Prefer not to answer

Do you have any medical training?

- Yes
- No

What is your income?

- Prefer not to answer
- >\$100,000 per year
- \$50,000-100,000 per year
- \$30,000-50,000 per year
- <\$30,000 per year

Insurance status

- Private insurance
- Public insurance
- Uninsured

Has a doctor or another health care worker diagnosed you with or treated you for one of the following medical problems in the past three years? (Answer choices were: Yes; No; Refuse to answer)

- Asthma, emphysema or chronic bronchitis
- High blood pressure or hypertension
- High blood sugar or diabetes
- Arthritis or rheumatism (inflammation of the joints)
- Angina, heart failure or other types of heart disease
- Stroke, seizures, Parkinson’s disease, or another neurological condition

- Liver disease
- Kidney or renal disease
- Cancer diagnosed or treated in the last three years
- Anxiety or depression
- Some other psychiatric disorder

Do you have any other medical problems that we did not ask about?

In the past 3 months have you used any of the following drugs? Your answers are confidential. (Answer choices were: Yes; No; Decline to Answer)

- Cigarettes
- Alcohol 4 or more times per week
- Marijuana
- Cocaine
- Heroin

AFTER THE PATIENT PORTION OF THE SURVEY WAS COMPLETED, THE RESEARCHER WOULD ANSWER THE FOLLOWING QUESTIONS BY REVIEWING THE PATIENT'S CHART:

Which area in the emergency department is the patient?

- High acuity
- Low acuity

What is the room number?

What is the chief complaint?

How many ED visits did the patient have in the past 3 months?

What is the patient's age?

What is the medical record number?

What is the patient's gender?

- Male
- Female
- Non-binary/Third gender
- Prefer not to say

Was the patient admitted?