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CARED for ED non-emergency care: college student acceptance, ranking, and economic deterrents of ED non-emergency care

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A Thesis Submitted by

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INTRODUCTION:

There has been increasing concern from hospitals and insurance policyholders over the rise of Emergency Department (ED) visits, as it is linked with overcrowding and longer waiting times; an increasingly large proportion of these ED visits are described as non-urgent or clinically unnecessary (O'Keefe, 2017; Pierce, 2009). "Clinically unnecessary," "low acuity," "non-urgent," and "inappropriate" are all terms used to describe visits to the ED that would be better managed in other care settings (O'Cathain et al., 2020). These conditions can be sufficiently treated more quickly and at a lower cost at other locations, while not taking up space in the ED that could be used for more urgent conditions. The purpose of this project is to understand how college students' perceptions of Emergency Departments influence their decisions on where to seek medical care.

BACKGROUND:

Emergency Department (ED) visits are often associated with high costs to all stakeholders involved, including the patients, hospitals, employers, and insurance providers. The high cost to the hospital is attributed to the need for a 24-hour staff and expensive equipment to provide the care that an ED is responsible for (Moskop, 2010). While charges for ED visits are highly variable, one study found the average charge for the ten most common diagnoses (including muscle sprains, open wounds to the extremities, kidney stones, normal pregnancy, headache, back pain, upper respiratory infection, intestinal infection, and urinary tract infections) was $1,233 (Caldwell et al., 2013). The decision to visit an ED for a low acuity condition likely increases the out-of-pocket cost to the patient, the charge to insurance providers, and the cost for the hospital as well (Moskop, 2010).

Hospitals (ED)

Overcrowding in the ED leads to many negative outcomes for the hospital itself. It has been linked to increased patient mortality, medical error, wait times, ambulance diversion, and financial losses (Salway et al, 2017). In addition, overcrowding in the ED has been linked to increased job dissatisfaction among emergency physicians (Rondeau et al., 2005). Ambulance diversion is experienced by over 50% of hospitals nationally, and one study found that each hour a hospital spends on diversion results in an average loss of $1,086 in potential revenues (McConnell et al, 2006; Castillo et al, 2011). With over 91% of hospitals reporting a problem of overcrowding, finding ways to minimize this is of great importance to the hospital, as it can help improve financial and medical performance and employee satisfaction (McConnell et al, 2006).

Employers

One study states that most large employers in the United States provide some form of health plan to their employees; these plans cover two-thirds of non-elderly Americans and account for one-quarter of national healthcare spending (O'Brien, 2003). The unnecessary use of the ED is of particular interest to these employers, as the significantly higher cost of the ED results in higher incurred costs to the employer paying for insurance. For this reason, employers have tried many strategies to decrease the number of ED visits by their employees. One study found that a two-part program involving increased copays on ED visits and employee education lowered the number of ED visits and made employees more likely to seek other care options (Devries et al, 2012). The concern over increasing copays is that it will discourage employees from seeking out healthcare altogether. However, some studies have shown that, while ED copays do decrease the amount of ED visits made by employees, the copays do not influence unfavorable clinical outcomes, which suggests that ED copayments do not discourage healthcare

utilization in total (Hsu et al., 2006). Employers would benefit greatly from understanding why their employees choose the ED when other options are more appropriate. This information could inform the development of health education programs that employers offer their employees. This information could also help formulate employee benefits packages in terms of offering sick time so that employees seek out preventative care.

Patients

Cost information directly impacts patients' decisions when choosing where to go for medical care, especially for low-acuity conditions. Studies have shown that health literacy and health insurance literacy have a positive correlation with the appropriate utilization of medical care (Yagi et al., 2021). Health insurance literacy is the knowledge of insurance terms and the ability to apply insurance concepts, and it has been shown that the health insurance literacy of the general population is low (Yagi et al., 2021). Research into health literacy and health insurance literacy of college students suggests that college students have a relatively high level of health literacy but a relatively low level of health insurance literacy; low levels of health insurance literacy are thought to stem from inexperience in managing their own insurance (Ikes and Cottrell, 2010; Upadhyay, 2022).

Studies have shown that younger adults are significantly more likely to visit the ED for clinically unnecessary reasons, and while the media has portrayed "convenience" as being the leading driver of these visits, studies have shown that these visits are fundamentally driven by many different factors (Long, 2021). Researchers have attempted to understand and explain the main driving factors behind clinically unnecessary visits, and it has been observed that many factors are interrelated. One study found that six fundamental mechanisms can be applied to describe the majority of these visits: risk minimization, need for speed, availability of quality

care, frustration, compliance, and low effort (O'Cathain et al., 2020). There have been varying findings about whether cost is a leading factor when people choose the ED (O'Cathain et al., 2020). Patients may choose the ED for care for one or many of these combined reasons.

While extensive research has been conducted to understand why a patient might choose to visit an ED, not much has been done to understand how these mechanisms apply to college students specifically. Being a significant portion of the next generation of family healthcare decision-makers and having a generally low level of experience making healthcare decisions, college students represent a unique population that can be the target of preventative measures to reduce clinically unnecessary visits in the future. Additionally, while research into this subject has been mainly used by public health professionals to assist with policymaking, it has not been thoroughly discussed how businesses that provide employee health plans can use this information to develop employee education programs to help reduce the number of ED visits. Employers, as major funders of insurance, must cover these additional costs, especially for those employers who are self-insured and fully at risk for bills.

The purpose of this project is to understand how college students' perceptions of Emergency Departments influence their decisions on where to seek medical care. This research intends to answer the following questions:

1. What low acuity medical conditions are college students most likely to associate with the need to visit the ED?
2. What are the most common drivers for college students visiting the emergency department for clinically unnecessary reasons?
3. How do costs to the patient, the hospital, and the insurance provider influence clinically unnecessary visits?

Reflecting on the results of the student responses the research will also lead to recommendations for actions that hospitals can take to reduce the number of clinically unnecessary ED visits and resultant overcrowding and wait times. Employers, who are the purchasers of insurance and major funders of care, can gain more understanding of the decision-making process of their employees, and therefore minimize the cost the company incurs from clinically unnecessary ED visits by their employees, especially recent college graduates.

METHODOLOGY:

To explore the research aims, I designed a survey to collect student thoughts about the use of the ED for low acuity and unnecessary care. Surveys are the most time-efficient method for collecting the perceptions of a larger sample. Since the decision to use an ED for care is potentially influenced by the costs of care, a matched scenario-based survey was determined to be the best method for determining if cost is a deterrent from the ED. I developed a three-part scenario-based survey using Qualtrics that included the following sections: Consent and General Demographics, Pre-Price Scenarios, and Price Included Scenarios.

Consent And General Demographics (1st Part)

This section of the survey presented participants with a consent agreement that ensured they are over the age of 18 and they were willing to participate in the UTC IRB-approved study (IRB #22-116). It clearly stated that the survey was not asking about any private health information, but instead was asking about what a participant would do in certain hypothetical situations. Participants were asked to provide general demographic information including age, race, ethnicity, gender, and major. Finally, participants were asked if they themselves had been a patient in an emergency department in the past.

Pre-Price Scenarios (2nd Part)

This section of the survey presented participants with 7 different scenarios in which they face different low-acuity conditions. In each scenario, the participants were instructed to make their decisions based on the assumption that they were having no success treating the condition on their own and that they had decided they needed to receive professional medical care. The conditions were as follows: low back pain, a long-lasting headache, an itchy rash, a persistent cough, a shallow cut, severe anxiety, and unusual long-lasting tiredness. For each scenario, participants were given five medical care options to choose from: the emergency department, urgent care, a walk-in clinic, an online medical service, or a primary care physician. Participants were asked to rank-order their top three choices for care in each scenario, as shown in Figure 1. I included the following descriptions of the care options before the scenarios.

- **Primary Care Physician:** Family doctors care for patients of all ages. This is most likely the doctor that you see for regular checkups.
- **Walk-in Clinic:** Convenience care clinics let you walk in without an appointment and can offer treatments for many common symptoms. Ex.) Minute Clinic, or Little Clinic
- **Online Medical Service:** You can talk by phone or video with a doctor who can diagnose common medical conditions and even prescribe medications if needed.
- **Urgent Care:** Urgent care centers are often open on evenings and weekends and available for immediate treatment of injuries or illnesses that are not life-threatening.
- **Emergency Department:** For immediate treatment of serious injuries or conditions. ED's are found at hospitals and are open 24/7.

Figure 1. Pre-Price Scenario

Pre-Price Scenario Answer Options

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
Urgent Care	○	○	○
Walk-in Clinic	○	○	○
Online medical service	○	○	○
Primary Care Physician	○	○	○

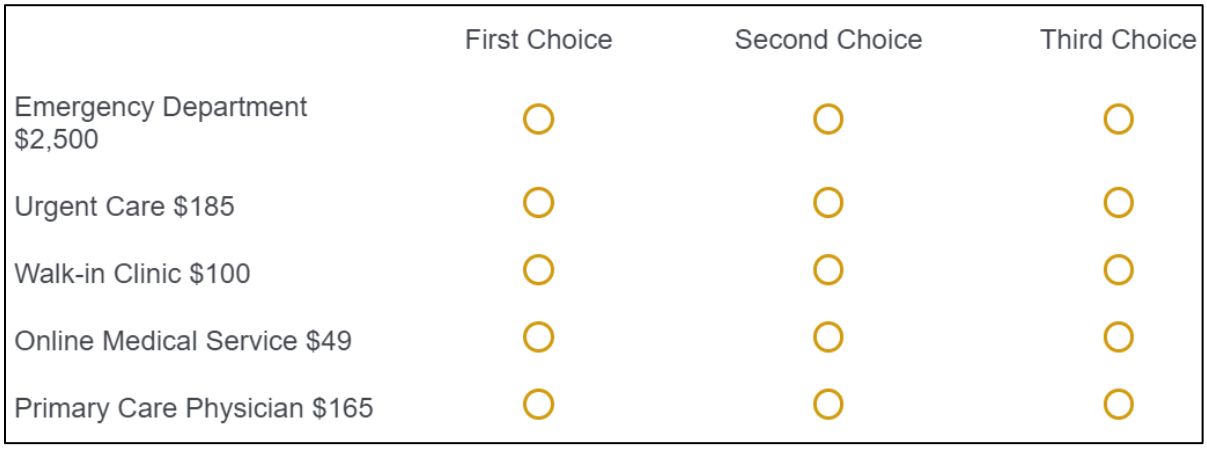
At the end of this section of the survey, Participants were presented with a free-response question asking what factors they considered most when deciding where to go to receive health care.

Price-Included Scenarios (3rd Part)

The final section of the survey presented participants with the same scenarios and care options as the previous section, and they were asked to rank their choices again. However, for each scenario, cost estimates based on U.S. national data from United Health Care (United Health Care Services, 2021) were presented with the care options to determine an average expected cost for each care option and included these prices in each scenario. The answer options for the Price-Included scenarios are shown in Figure 2.

Figure 2. Price Included Scenarios

Price Included Answer Options



This allowed me to compare results from both sections and determine what influence cost has on decisions about medical care.

Sampling Methods

My aim was to recruit a diverse sample of 100 college students above the age of 18 years old who were currently attending the University of Tennessee at Chattanooga. Recruitment was done primarily through messages on GroupMe, a social media platform widely used for classes at the University. I sent direct messages to campus organizations, classes in the Rollins College of Business, and classes in the College of Health, Education, and Professional Studies asking for participants to fill out the survey. This convenience sample was chosen since an incentive to participate was not available and had the highest likelihood of eliciting responses since these were classmates and peers. A total of 169 responses to the survey were collected over 4 weeks.

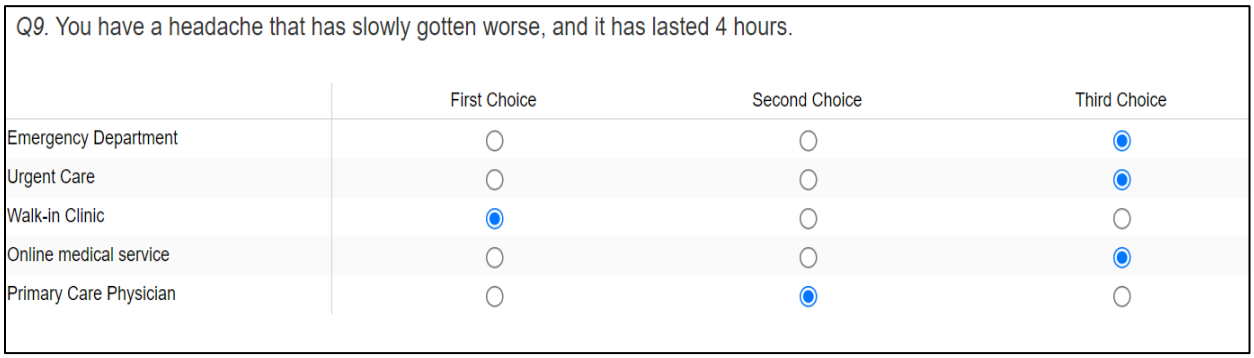
Data Preparation

When extracting the data from Qualtrics, answer options that were chosen for the first choice were coded as 1, options chosen for the second choice were coded as 2, and options chosen for the third choice were coded as 3. Options that were not chosen were initially coded

as blanks, and I recoded these cells as 4. This allowed for the use of these values when calculating means and t-test values. In total 169 students responded to the survey. Some surveys were completed incorrectly, and some surveys were not completed. The Qualtrics platform did not allow us to limit the number of answers a participant could choose on any given question. Many participants chose more than one option for each ranking position as shown in Figure 3.

Figure 3. Ranking Survey Issue Example

Incorrectly Filled Question



This made it impossible to determine the participants' true preferences. Due to this, 60 responses were discarded, and 109 survey responses were used for the analysis of this study.

Data Analysis

The data was analyzed using the Graph Pad t-test calculator by Dogmatics. Normality checks were done by creating histograms of the data. Although the histograms were skewed, we assumed the normality of the data due to the large sample sizes ($n > 30$). A paired t-test was used to test the hypothesis that the mean value of ED choice in the first section of the survey would be significantly different from the mean value of ED choice in the second section of the survey. Welch's T-test was used to determine if there was a significant difference in the mean value of ED choice between students in the College of Health, Education, and Professional Studies and students in other education departments. This was used to test the hypothesis that students in

health-related majors would be less likely to choose the ED due to the assumption that they had an increased knowledge of healthcare. Welch's T-test was also used to determine if there was a significant difference in the mean value of ED choice between students who had prior experience in the ED and students with no prior experience. Welch's T-test was used instead of the student T-test due to the different sample sizes in the second two tests.

RESULTS:

Of the 169 responses received, 61 participants filled out the survey incorrectly. Demographic analysis of the excluded participants showed no major demographic differences from the participants that were included in the rest of the study. The demographic distributions of each group are shown in Figure 4. Both the included and excluded groups showed roughly the same distribution of majors, genders, and classes. This confirmed that the smaller sample of 108 participants included in the analysis still accurately represented the larger population. Next, the results of frequencies of the choice of care options is discussed.

Figure 4. Respondents vs. Dropped Respondents by Major, Gender, and Class

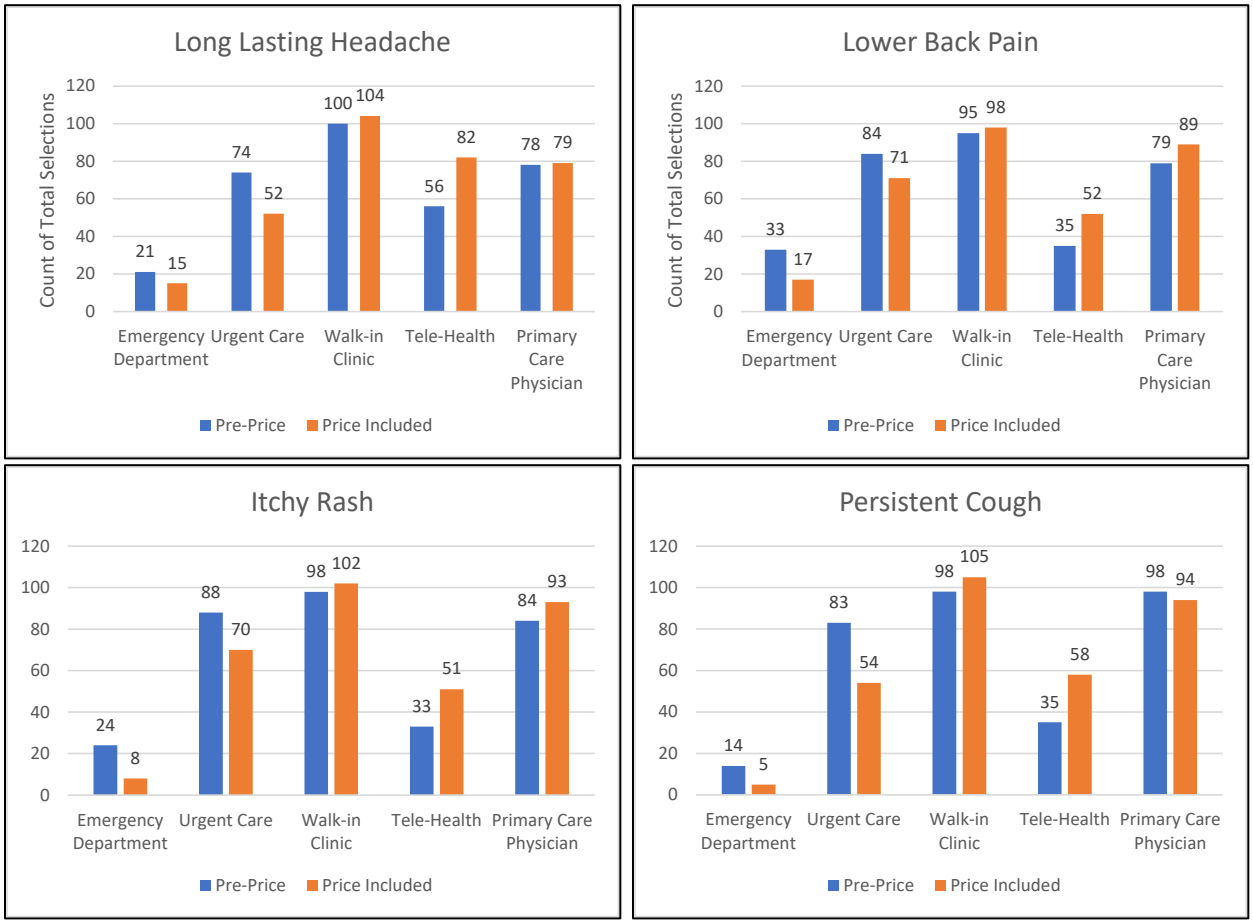
	Major Department				
	CHEPS	RCOB	CECS	Arts and Sciences	Other
Included (n=109)	41%	14%	7%	31%	6%
Excluded (n=60)	32%	18%	7%	37%	7%

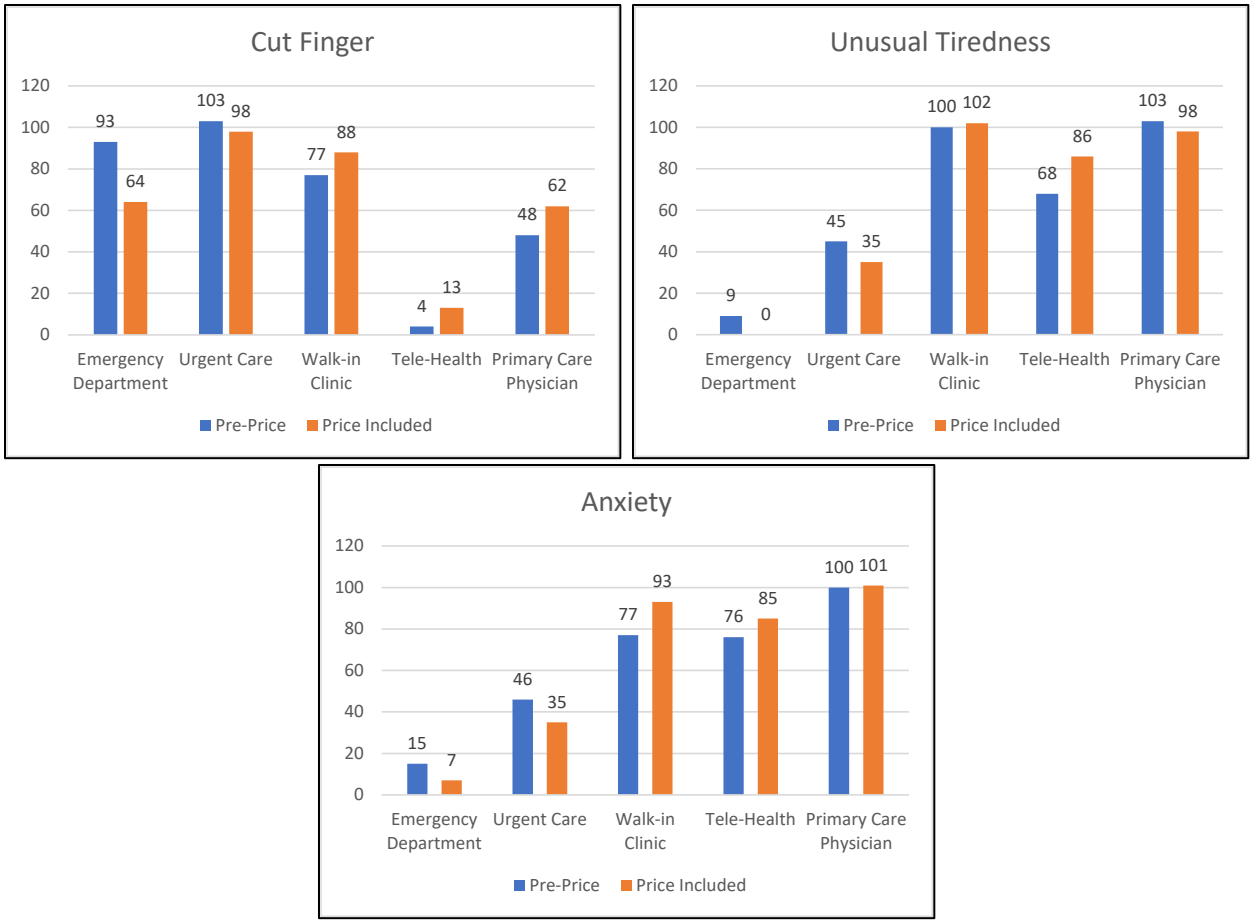
	Gender			
	Male	Female	Non-Binary	Prefer Not to Say
Included (n=109)	27%	72%	1%	1%
Excluded (n=60)	26%	66%	9%	0%

	Classification						
	Freshman	Sophomore	Junior	Senior	5th Year	Graduate Student	Unclassified
Included (n=109)	8%	20%	28%	38%	2%	2%	2%
Excluded (n=60)	8%	17%	35%	33%	5%	2%	0%

The counts of total selections by scenario, regardless of rank, are shown in Figure 5. Of the five care options presented, the Emergency Department was the least chosen option in every scenario excluding the Cut Finger Scenario. The Emergency Department was least chosen in the Nagging Cough and Unusual Tiredness scenarios where it was chosen 19 and 9 times respectively in both the pre-price and price included sections. The Cut Finger scenario had the most Emergency Department selections. The counts of total selections by scenario are shown in Figure 5.

Figure 5. Frequencies of Scenario Selection





It was observed that the Emergency Department was not selected at a high rate across most of the scenarios. However, a paired t-test of the means of each scenario in the Pre-Price section and the Price-Included section determined that there was a significant difference between the two sections in all but one scenario. The mean, standard deviation, and P-value of each scenario are displayed in Table 1. In every scenario, the mean selection value for the Price Included scenario was higher than the Pre-Price scenario. The mean calculation was done according to the given score for each choice (1st choice = 1, 2nd choice = 2, 3rd choice = 3, Not Chosen = 4). The higher mean indicates that the Emergency Department was selected less in the Price-Included scenarios.

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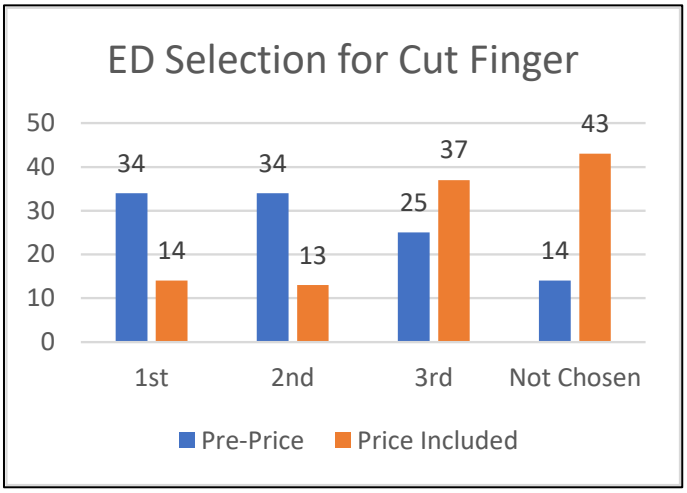
Table 1. ED Means by Scenario

	ED Means By Scenario						
	Headache	**Back Pain**	**Rash**	**Cough**	**Cut Finger**	**Tiredness**	**Anxiety**
Pre-Price Mean	3.7850	3.5514	3.7290	3.8505	2.1776	3.9159	3.7570
Pre SD	0.4764	0.7799	0.5758	0.4076	1.0262	0.2789	0.6846
Price Included Mean	3.8505	3.8131	3.9252	3.9346	3.0187	4.0000	3.9252
Post SD	0.3837	0.4784	0.2643	0.3154	1.0277	0.0000	0.2978
P-value	0.2102	**0.0001**	**0.0008**	**0.0284**	**0.0001**	**0.0023**	**0.0061**

The Cut Finger scenario saw the most participants selecting the Emergency Department, and it also saw the largest difference in mean between the Pre-Price and Price Included sections. The change in selection value for the Cut Finger scenario is shown in Figure 6.

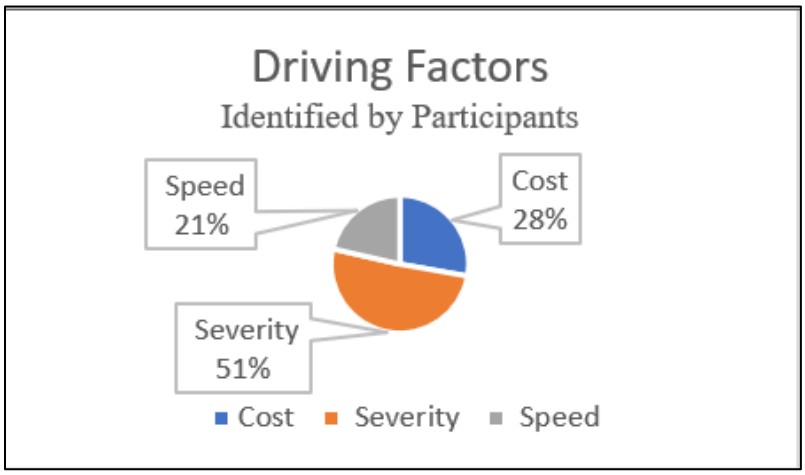
Figure 6. ED Selection for Cut Finger



Based on the free response question at the end of the Pre-Price section, participants identified three main driving factors behind their decisions on where to receive care. Students who referred to price, cost, or insurance were put into the "Cost" category. Common responses in this category can be summed up by the response "Whether or not insurance is accepted there, and if not, how much it is going to cost. I want the cheapest option possible." Students who referred to availability, speed of care, or wait time were put into the "Speed" category. Common responses in this category included: "how quickly I can receive a service", "who is most readily

available," and "convenience." Students that referred to the severity of the injury, urgency, or pain level were put into the "Severity" category. Common phrases in this category included "severity of symptoms and how quickly they formed," "level of pain/discomfort," and if symptoms "interfere with day-to-day life." Severity was the most common driver with 64 participants claiming that as one of their main considerations. 35 participants claimed cost was the main driver in their decision, and 27 participants claimed speed of care was the main driver in their decision. Some participants were included in multiple categories, as they listed multiple considerations in their decision. The following is an example of a response that was included in every category: "How quickly I can receive a service, how costly it will be, and how severe I think my condition is." The distribution of these categories is shown in Figure 7.

Figure 7. Factors Behind Healthcare Decisions



SUBSET ANALYSIS:

- ED Experience vs. No ED Experience

Subset analysis between students who had experience as patients in an ED and students who did not have that experience was completed with Welch's T-test. This was based off the survey question that asked if the student had been a patient in the ED themselves in the past. In total, 69 participants claimed to have been a patient in an ED before, and 39 participants

claimed to have never been a patient in an ED. There was no statistically significant difference in the mean selection values of these two groups in either the Pre-Price scenarios or the Price-Included scenarios. Table 2 shows the mean selection values, standard deviations, and P-values of the Pre-Price and Price-Included scenarios.

Table 2. Pre-Price and Price-Included scenarios by ED Experience

Pre-Price	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Experience Mean	3.768	3.507	3.667	3.812	2.072	3.942	3.841
Experience SD	0.519	0.816	0.657	0.463	1.005	0.235	0.559
No Experience Mean	3.821	3.615	3.846	3.923	2.385	3.872	3.615
No Experience SD	0.389	0.711	0.366	0.270	1.042	0.339	0.847
P-Value	0.554	0.474	0.071	0.117	0.134	0.256	0.099

Price-Included	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Experience Mean	3.841	3.783	3.928	3.899	2.942	4.000	3.913
Experience SD	0.407	0.511	0.261	0.389	1.083	0.000	0.284
No Experience Mean	3.872	3.846	3.923	4.000	3.154	4.000	3.949
No Experience SD	0.339	0.432	0.270	0.000	0.904	0.000	0.320
P-Value	0.670	0.348	0.934	**0.034**	0.304	NA	0.551

- CHEPS vs Other Majors

A similar subset analysis was performed on the difference in selection values between students in the College of Health, Education, and Professional Studies (CHEPS) and students in other major departments. Some participants in the CHEPS commented that their experience working in healthcare made them more likely to seek care in places other than the ED. In total there were 45 participants from the CHEPS, and there were 57 students from other majors. There were no statistically significant differences found in the mean selection values between these two groups in the Pre-Price or Price-Included scenarios. Table 3 shows the mean selection values, standard deviations, and P-values of the Pre-Price and Price-Included scenarios.

Table 3. Pre-Price and Price-Included Scenarios by Major

Pre-Price	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Health Majors Mean	3.756	3.556	3.800	3.844	2.200	3.956	3.689
Health Majors SD	0.570	0.755	0.548	0.367	1.014	0.208	0.821
Other Majors Mean	3.825	3.561	3.719	3.895	2.228	3.895	3.789
Other Majors SD	0.384	0.756	0.590	0.363	1.053	0.310	0.590
P-Value	0.488	0.969	0.477	0.491	0.892	0.240	0.491

Price-Included	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Health Majors Mean	3.889	3.800	3.933	3.956	3.022	4.000	3.911
Health Majors SD	0.383	0.548	0.252	0.298	0.941	0.000	0.358
Other Majors Mean	3.825	3.807	3.912	3.930	3.070	4.000	3.930
Other Majors SD	0.384	0.441	0.285	0.320	1.050	0.000	0.258
P-Value	0.402	0.944	0.694	0.676	0.809	NA	0.769

- Cost Priority vs Other Priority

A third subset analysis was performed between participants who listed cost as a major driving factor in their decision and participants who listed other driving factors. In total, 35 participants listed cost as a major driving factor, and 73 participants listed either severity or urgency as a driving factor. Participants who listed cost as a driving factor were significantly less likely to choose the ED in both the pre-price and price-included cut finger scenario. No other scenario showed a significant difference between the two groups. Table 4 shows the mean selection values, standard deviations, and P-values of the Pre-Price and Price-Included scenarios.

Table 4. Pre-Price and Price-Included Scenarios by Priority

Pre-Price	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Cost Priority Mean	3.886	3.629	3.743	3.857	2.600	3.943	3.829
Cost Priority SD	0.323	0.731	0.611	0.430	1.006	0.236	0.618
Other Priority Mean	3.740	3.507	3.726	3.863	1.986	3.904	3.726
Other Priority SD	0.528	0.801	0.559	0.384	0.979	0.296	0.712
P-Value	0.080	0.435	0.891	0.946	**0.004**	0.465	0.445

Price-Included	Headache	Back Pain	Rash	Cough	Cut	Tiredness	Anxiety
Cost Priority Mean	3.914	3.857	3.971	3.971	3.371	4.000	3.857
Cost Priority SD	0.284	0.355	0.169	0.169	0.770	0.000	0.430
Other Priority Mean	3.822	3.781	3.904	3.918	2.836	4.000	3.959
Other Priority SD	0.420	0.534	0.296	0.363	1.080	0.000	0.200
P-Value	0.182	0.380	0.137	0.298	**0.004**	N/A	0.190

DISCUSSION:

Summary of Findings

Among the participants of this study, the severity of symptoms, cost to the patient, and speed/availability emerged as the three main considerations in decisions made about where to receive healthcare, and many participants listed some variety of a combination of these three main factors. Severity and speed/availability support two of the six main mechanisms identified in O'Cathain et. al's study (2020). The participants' focus on cost suggests an additional mechanism for patients' decision-making. Although each of these considerations is multifaceted and subjective based on individual experiences, participants seem to follow similar logic paths when making their decisions. The complexity and subjectivity of these considerations led to the variety in decisions between participants who listed the same main considerations.

Among the seven scenarios presented to participants, the cut finger scenario resulted in significantly higher use of the Emergency Department. This was the most severe of the seven scenarios, so it was expected to result in increased use of the more urgent care options like the ED and Urgent Care. This could be due to the sudden nature of this condition, and it is likely that it is perceived to make someone incapable of continuing their normal daily responsibilities. This supports O'Cathain et. al's program theory of a need for speed (2020). This could also be due to the fact that some of the care options listed would not be able to provide adequate care. For example, some people chose telehealth services for a cut finger, but that would not be an appropriate place to seek care. Interestingly, all six other scenarios resulted in significantly lower

use of the ED. Although the six remaining scenarios did not warrant a trip to the ED, I expected more participants to consider it an option when the price was not displayed. For most of the scenarios, the ED was not the most appropriate option for care, and most participants of this study made responsible decisions to avoid the ED. This may speak to the overall higher health literacy in college students compared to the general population due to their continuing education (Ickes and Cottrell, 2010). Higher health literacy results in more confident and responsible decisions about healthcare.

The major finding of this study is that, although most participants made the responsible decision to avoid the ED, the ED was still unnecessarily chosen by some participants. However, when participants knew the cost of the health care options, they chose the ED significantly less often, and when they still chose the ED, they chose it as an alternative option. These findings indicate that clear knowledge of cost is a deterrent to the unnecessary use of the ED by college students. The result of this price transparency is dependent on two things. The first is that the patient has access to the prices of their care options. The second is that the patient understands how that initial price will cost them out of pocket, and this requires an understanding of how their insurance works. If both conditions are met, this study indicates that price can be a tool used to decrease the number of unnecessary ED visits.

Interestingly, and against the initial hypothesis, there was no significant difference in the mean selection value of the ED between students in the CHEPS and students in other major departments. I hypothesized that students studying in the field of health studies would have an increased awareness of the appropriate options of care. This was partially supported by three students from the CHEPS that referenced their own work experience in the ED as a reason for avoiding seeking care in the ED for non-emergency conditions. The lack of significant difference

may be due to the small sample of students in the CHEPS. Additionally, it may be due to the variety of majors in the CHEPS. Although students majoring in health studies are included in the CHEPS, it also includes students majoring in non-health-related fields such as Education.

Similarly, the subset analysis on ED experience as a patient showed significant differences only in the cough scenario. The increased use of the ED from people who had previous experience in the ED may be due to a level of comfortability with their previous experience. The subset analysis on participants who listed cost as a main driver saw a significant difference only in the cut finger scenario. This could be due to the general low selection of the ED in the other six scenarios.

IMPLICATIONS:

Employers

Employers that provide health insurance to their employees can use the findings of this study to better inform their employee education. Participants' aversion to the high cost of the ED supports the idea that increasing copayments would be an effective incentive to seek other care options. Employers can focus their education programs on employees' knowledge of the costs associated with each care option. If the employer can effectively communicate the costs that employees will pay out of pocket, they will likely see a decrease in the amount of ED visits. Not only would employees be less likely to visit the ED, but they would also be more likely to seek out preventative care if they understand their insurance coverage. One additional step an employer can take would be to include sick time in benefits packages and to encourage preventative care. By encouraging the responsible use of health care, employers could also have the added benefit of a decrease in the absenteeism of employees.

Health Care Providers

Healthcare providers themselves could benefit from the findings of this study. Urgent care centers could absorb some of the overcrowding in surrounding EDs if the population understands the benefits. Urgent care centers need to advertise the services they offer so people know that they can treat semi-severe injuries such as cuts and broken bones. This advertisement of services along with added price advertising could increase the usage of urgent care centers, and it could likely decrease the strain of overcrowding on local ED. Hospitals can benefit from this by implementing in-house forms of urgent care. By dedicating staff to caring for non-emergency patients in another location, hospitals could potentially reduce overcrowding without losing revenues to other locations.

LIMITATIONS:

Some limitations need to be considered for this study. The primary limitation of this study is the generalizability of the results due to the sampling method. Although the convenience sampling method used ensured the highest possible response rate, it may not have captured a fully representative sample of the university, and the inclusion of only one university places limits on the ability of the study's results to be generalized to all college students. A secondary limitation of the study was the inability to limit the format of participants' responses to the correct format. Qualtrics did not allow control over the way participants inputted their responses, which led to a portion of responses being unusable. Not using these responses may have skewed the results of this study. A third limitation of this study was its lack of insight into the effect of location on students' decisions. Decisions on healthcare often are influenced by differences in the availability of services in the area, such as urban versus rural environments, but this survey does not account for this difference. These limitations offer opportunities to improve with future

research. With more resources, future studies could be done with an expanded sample by using incentives to randomly recruit participants from multiple different colleges. This would allow for a larger and more diverse sample that would lead to more generalizable results.

FUTURE DIRECTIONS

While this study provides insights into college students' perceptions of medical care decisions for low-acuity conditions, there is an opportunity for further research into understanding how this population compares to other populations of different age and education levels. Using this survey format can help to identify people who are likely to use the ED for non-urgent conditions, and it could help inform efforts to reduce such use. Additional value could be drawn from using this study to compare the effectiveness of interventional efforts.

CONCLUSION:

Understanding the reasons people choose to utilize the ED for non-emergent conditions can have many positive applications for all stakeholders involved. People who understand the out-of-pocket cost they will incur from the ED are more likely to choose other, more appropriate care options. Education provided by employers, hospitals, other medical establishments, and patients themselves of the costs and services associated with care settings will likely lead to the more responsible utilization of these services, which will result in lower costs to the employer, patient, and hospital.

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APPENDIX

Informed Consent

INFORMED CONSENT

CARED for ED Non-emergency Care: College student Acceptance, Ranking, and Economic Deterrents of ED Non-emergency Care

You are being invited to participate in a research study about how college students' perceptions of Emergency Departments influence their decisions on where seek medical care.

This study is being conducted at the University of Tennessee at Chattanooga (UTC) as part of an undergraduate honors student project by Evan Britt, kyv765@mocs.utc.edu, and Dr. Mullen, Deborah-mullen@utc.edu. You were selected as a possible participant in this study because you are a student at UTC. The questionnaire(s) will take about 5-10 minutes to complete.

We do not expect you to benefit from your participation in this study. Information gained from this research may benefit others in the future. Depending on your life experiences, thinking about some of the questions in this survey may be stressful. You may skip any question you find too uncomfortable to answer, and you have the right to withdraw from the study at any time. If you become uncomfortable or distressed and need assistance, the following resources are available (the list is also provided at the end of the survey): University Counseling Center, 423-425-4438 (M-F 9 am – 4 pm); 24/7 crisis line 423-425-2273. Additional resources and crisis hotlines are listed on the American Psychological Association's website.

This survey is anonymous. Do not include your name or any of your contact information in your responses to the survey. Your responses to the survey will not be linked to your computer, email address or other electronic identifiers. No one will be able to identify you or your answers.

Research at UTC involving human participants is carried out under the oversight of the Institutional Review Board. Address questions or problems regarding these activities to Dr. Susan Davidson, UTC IRB Chair, email: susan-davidson@utc.edu; phone: (423) 425-1387. Please indicate your decision regarding participation in this research by selecting a response

- ○ I am at least 18 years of age, have read and understand the information above, and want to participate in the study.
- ○ I do not wish to participate in the study, or I am younger than 18 years of age.

Demographics

What is your racial or ethnic identification? (Check all that apply).

- ☐ American Indian or other Native American
- ☐ Asian or Pacific Islander
- ☐ Black or African American
- ☐ Caucasian (other than Hispanic)
- ☐ Mexican-American
- ☐ Puerto Rican
- ☐ Other Hispanic
- ☐ Prefer not to answer

What is your gender identity? (Check all that apply)

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer not to say

What is your classification in college?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ 5th Year Senior
- ○ Graduate Student
- ○ Unclassified (not degree-seeking)

What is your expected graduation year?

- ○ 2022
- ○ 2023
- ○ 2024
- ○ 2025
- ○ 2026

What is your major department?

- ☐ College of Arts and Sciences
- ☐ College of Engineering and Computer Science
- ☐ College of Health, Education and Professional Studies
- ☐ Gary W. Rollins College of Business
- ☐ Other

Which of the following would best describe your family's income when you were a child?

- ○ Low income
- ○ Lower-middle class income
- ○ Middle class income
- ○ Upper-middle class income
- ○ High income
- ○ Prefer not to answer

Have you ever been a patient in an Emergency Department?

- ○ No
- ○ Yes

Pre-Price Scenarios

In this section, you will be presented with hypothetical scenarios. Each scenario takes place on a weekday morning, so each care option is open and available. Assume that you have tried everything you know of to manage your symptoms, and nothing is working. You have decided that you need to get medical attention. You will be presented with five options of where to go to receive healthcare. Rank your top 3 preferences of where to receive healthcare for each scenario. "1" would be the first place you would choose to go.

Options For Care:

Primary Care Physician: Family doctors care for patients of all ages. This is most likely the doctor that you see for regular checkups.

Walk-in Clinic: Convenience care clinics let you walk in without an appointment, and can offer treatments for many common symptoms. Ex.) Minute Clinic, or Little Clinic

Online Medical Service: You can talk by phone or video with a doctor who can diagnose common medical conditions and even prescribe medications if needed.

Urgent Care: Urgent care centers are often open on evenings and weekends and available for immediate treatment of injuries or illnesses that are not life-threatening.

Emergency Department: For immediate treatment of serious injuries or conditions. ED's are found at hospitals and are open 24/7.

You have a headache that has slowly gotten worse, and it has lasted 4 hours.

	First Choice	Second Choice	Third Choice
Emergency Department			
Urgent Care			
Walk-in Clinic			
Online medical service			
Primary Care Physician			

You wake up with severe low back pain. You do not know the cause of this low back pain.

	First Choice	Second Choice	Third Choice
Emergency Department			
Urgent Care			
Walk-in Clinic			
Online medical service			
Primary Care Physician			

You have an itchy rash on your upper back that is spreading slowly down your back. You do not have any other symptoms.

	First Choice	Second Choice	Third Choice
Emergency Department			
Urgent Care			
Walk-in Clinic			
Online medical service			
Primary Care Physician			

You have had a nagging cough that has lasted over two weeks.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
Urgent Care	○	○	○
Walk-in Clinic	○	○	○
Online medical service	○	○	○
Primary Care Physician	○	○	○

You cut your finger while cooking, and you think that you may need a few stitches.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
Urgent Care	○	○	○
Walk-in Clinic	○	○	○
Online medical service	○	○	○
Primary Care Physician	○	○	○

You have been getting your normal amount of sleep, but you experience unusual tiredness that has lasted for two weeks.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
Urgent Care	○	○	○
Walk-in Clinic	○	○	○
Online medical service	○	○	○
Primary Care Physician	○	○	○

You begin to experience severe anxiety.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
Urgent Care	○	○	○
Walk-in Clinic	○	○	○
Online medical service	○	○	○
Primary Care Physician	○	○	○

What factors do you consider most when deciding where to go to receive healthcare?

Price Included Scenarios

In the last section of this survey, you will be presented with the same scenarios as the previous section. However, the options will be listed with an estimated price associated with each care location. Rank your top 3 preferences of where to receive healthcare for each scenario. "1" would be the first place you would choose to go.

You have a headache that has slowly gotten worse, and it has lasted 4 hours.

	First Choice	Second Choice	Third Choice
Emergency Department $2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165	○	○	○

You wake up with severe low back pain. You do not know the cause of this low back pain.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
$2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165			

You have an itchy rash on your upper back that is spreading slowly down your back. You do not have any other symptoms.

	First Choice	Second Choice	Third Choice
Emergency Department	○	○	○
$2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165			

You have had a nagging constant cough that has lasted over two weeks, and it is not getting any better.

Choice	First Choice	Second Choice	Third
Emergency Department $2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165	○	○	○

You cut your finger while cooking, and you think that you may need a few stitches.

Choice	First Choice	Second Choice	Third
Emergency Department $2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165	○	○	○

You have been getting your normal amount of sleep, but you experience unusual tiredness that has lasted for two weeks.

Choice	First Choice	Second Choice	Third
Emergency Department $2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165	○	○	○

You begin to experience severe anxiety.

	First Choice	Second Choice	Third Choice
Emergency Department $2,500	○	○	○
Urgent Care $185	○	○	○
Walk-in Clinic $100	○	○	○
Online Medical Service $49	○	○	○
Primary Care Physician $165	○	○	○