

Consequences of the TEMS Application Process & the Importance of Perception

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Introduction

We have conducted research on public perception and accessibility of Tulane EMS (TEMS) through the distribution of a survey to 4,000 undergraduates. Specifically, we chose to focus on the recruitment process and its role in the organization's public image. Every academic year, TEMS holds two rounds of selections for prospective members. The selections in the Fall semester are for non-EMT applicants, while the selections in the Spring semester are for applicants that currently hold an EMT certification or are enrolled in an EMT class. This holds true with the exception of the Fall 2020 semester, during which the recruitment process was open to both non-EMT and EMT applicants. It is presumed that the organization is most visible to the undergraduate student body at this time, therefore it is an important contributor to public opinion of TEMS.

The driving force behind this research is a hypothesis that rejected applicants are less likely to utilize TEMS' services, resulting from an issue of application fairness and public opinion. From a public health standpoint, utilizing this data to guide internal improvements of the TEMS organization can ensure quality patient care for individuals of all backgrounds and identities.

Methods

Study Design and Recruitment

This study was an online survey conducted through Qualtrics. Anonymized links were distributed via university email to a random sample of 4,000 Tulane University undergraduate students at least 18 years old and the TEMS member Listserv on November 2, 2020. Two reminder emails were sent to participants who had not completed the survey: one on November 9 and the other on November 16 before the survey was closed on November 20, 2020. Survey links allowed each participant to complete the survey once, and to resume an incomplete survey at a future time. The survey consisted of a maximum of 38 questions taking 15-20 minutes to complete.

Prior to completing the survey, participants were shown a consent document and asked to indicate if they wished to proceed. Participants were then screened with three questions to ensure that they were 1) a Tulane University undergraduate student, 2) at least 18 years old, and 3) spent the majority of their school or work time on Tulane's uptown campus, which is encompassed by TEMS's service area. Display logic was extensively employed to ensure respondents were only shown relevant questions, and multiple responses were accepted for most demographic, opinion, and reasoning questions. The majority of non-screening questions were optional (35 of 38) because many questions related to potentially traumatic or stressful events including medical

emergencies. The order of response options for questions with unordered responses were randomized with 'Other' remaining the final choice. Approval for this study was obtained from the TU Human Research Protection Office (2020-1348-Online).

Measures

Actions During Medical Emergencies

Participants were asked if they had ever called for TEMS, if they'd ever considered calling but decided not to, and what factors resulted in them not calling (if applicable). Participants were also asked to rate the likelihoods of the following actions during different kinds of medical emergencies or chief complaint categories (CCCs) using a five point likert scale: calling TEMS, calling 911, taking a different form of transportation to see a provider, and caring for it themselves. CCCs included minor trauma (small cuts, scrapes, burns without blistering), minor medical (stomach pain, fever, OB/GYN), psychiatric (anxiety attack, depressive episode, schizophrenia), ingestion (over-consuming alcohol, other drugs, or other poisonings), and cardiovascular/vascular (stroke, heart issues). Participants who indicated that they were anything other than 'likely' or 'very likely' to call TEMS were asked what factors reduced their likelihood of calling TEMS for that CCC.

An index of a participant's likelihood of calling TEMS over 911 for each CCC was calculated by subtracting an individual's likelihood of calling 911 from that of calling TEMS resulting in a scale from 4 to -4 for each CCC. Furthermore, the overall likelihood of an action during an emergency was calculated by taking the sum of likert responses for each action across all CCCs.

Opinions of TEMS Members

Participants were asked to rate agreement with a set of statements about TEMS members using a 5 point likert scale and if they personally knew any TEMS members. Six statements were shown to participants to assess perceptions of inclusivity, trustworthiness, and kindness of members including 3 reverse worded statements. Likert scores from the forward worded statements were subtracted from the reverse worded statements. An index of overall opinion of TEMS members (positive index) was calculated by taking the sum of inclusivity, trustworthiness, and kindness metrics for each participant.

Applicant Questions

Participants were asked if they had ever been interested in working as an EMT. Those who indicated they were not interested were not shown questions about the application process. Those who indicated that they were interested were asked if they had ever applied to TEMS. If they had not, they were asked if there were any reasons for not applying.

Participants who had applied to TEMS were asked during which semesters and how many times they applied. They were also asked if they had ever decided not to

reapply given the opportunity and to rate their perception of how fair the application process was on a five point likert scale. Anyone who thought the process was 'not at all fair' or 'unfair' was asked why they felt that the process was unfair to them. Participants who did not reapply given the opportunity were asked why they had not reapplied.

Demographics and Student Characteristics

Participants were asked to indicate their racial, sexual, and gender identities. Student characteristics included the school of their primary study area, their year of study, if they lived on or off campus, and if they were international or domestic. Although optional, if a participant did not fill out these questions before submitting the survey, they were shown a popup reminding them that they were left blank. For the purposes of analysis, responses were grouped by broad demographic factors including white, non-white, heterosexual, non-heterosexual, man, and not man.

Analyses

Statistical analyses were conducted using RStudio software version 1.3.1073. The demographic categories of our respondents were tested against comparable Fall 2020 reported university statistics using population proportion T-tests to determine if our sample is representative of the undergraduate population (Enrollment Profiles, 2020). Ordinal logistic regressions (MASS package) were used to model the predictive effects of different variables on the likelihood of calling TEMS over 911, the likelihood of calling TEMS for different CCCs, and the likelihood of holding positive opinions of TEMS members.

Results

A total of 397 participants completed our survey resulting in a partially representative sample of the university undergraduate population. This demographic sample represented by our data is consistent with prior surveys performed by the university student health center (SHC). Additionally, the proportions of white and non-white participants were not significantly different between our responses and the university's reported statistics on the race of undergraduate students (population proportion t-test, non-white: $p = 0.2926$, white: $p = 0.5827$). The university does not collect data on student gender or sexual orientation (only sex is recorded), so these demographics from our sample could not be compared (Enrollment Profiles, 2020).

Of the 397 respondents, 93 indicated that they had applied to TEMS and 184 said they had never applied to TEMS. Furthermore, 30 people indicated that they had reapplied at least once. The most commonly indicated reasons for not applying to TEMS initially were different from the reasons people didn't reapply to TEMS (Figures 1 and 2).

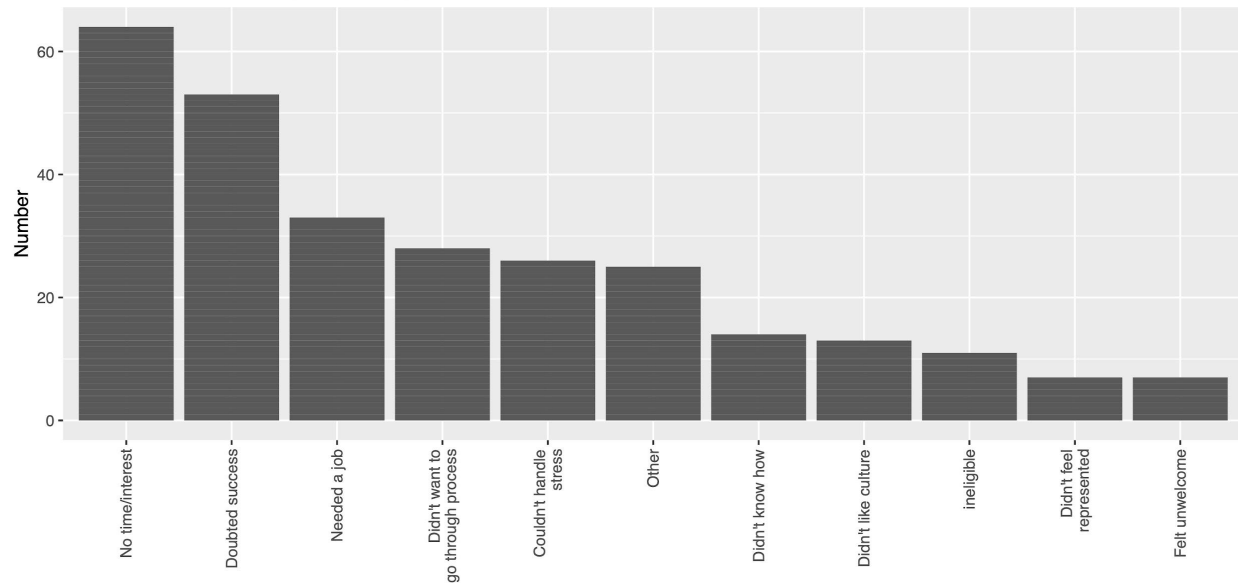


Figure 1: Reasons why people decided not to apply to TEMS initially

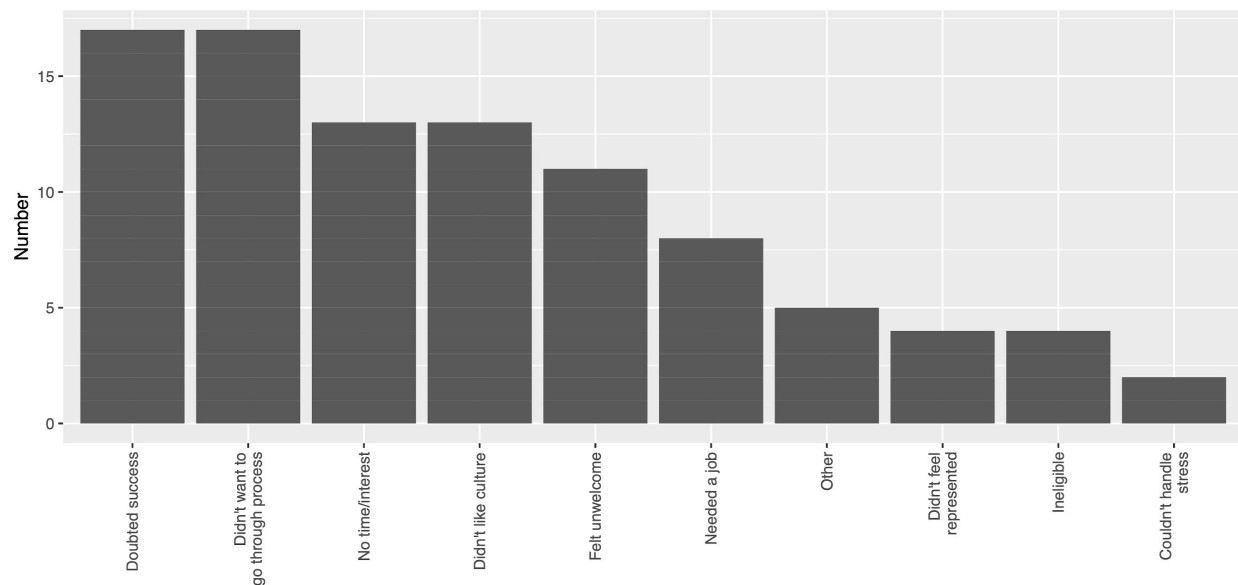


Figure 2: Reasons why people decided not to reapply to TEMS

We found that people with more positive opinions of TEMS members (greater positive index) have significantly increased odds of calling TEMS over 911 (OR = 1.207, $p < 0.001$). We also found that respondents with a greater positive index have significantly increased odds of calling TEMS for ingestion, cardiovascular/vascular, minor medical, and psychiatric emergencies (Table 1).

Table 1: Predictive effects of variables on the likelihood of calling TEMS during different emergencies. Values are odds ratios with parenthetical standard errors.

	Dependent variable: CCC				
	Ingestion (1)	Cardiovascular & Vascular (2)	Minor Trauma (3)	Minor Medical (4)	Psychiatric (5)
Non-white	1.315 (0.265)	2.162* (0.336)	1.196 (0.407)	1.540 (0.313)	1.526 (0.302)
Non-Heterosexual	0.669 (0.229)	0.797 (0.255)	0.803 (0.355)	0.912 (0.273)	0.480** (0.259)
Non-man	1.332 (0.246)	1.230 (0.283)	0.789 (0.356)	1.080 (0.294)	1.258 (0.266)
School year	0.916 (0.151)	1.308 (0.171)	0.782 (0.232)	1.120 (0.177)	0.928 (0.172)
Live on campus	1.058 (0.339)	1.484 (0.390)	0.450 (0.519)	1.337 (0.399)	0.911 (0.384)
Positive index	1.139*** (0.024)	1.222*** (0.029)	1.069 (0.036)	1.087** (0.029)	1.178*** (0.028)
Applied	0.982 (0.223)	0.708 (0.258)	0.986 (0.321)	0.557* (0.253)	0.593* (0.231)
Observations	331	329	328	328	326

Note:

*p<0.05; **p<0.01; ***p<0.001

Furthermore, we identified three significant predictors of positive index: school year, application fairness, and acceptance status (Table 2). The odds of having a positive opinion of TEMS members decrease by 0.345 for each school year advanced. People who perceive the TEMS application process as being more fair have increased odds of displaying a greater positive index. Having applied and not been accepted into TEMS decreases the odds of having a positive index by 0.297.

People who applied to TEMS and were not accepted have significantly decreased odds of calling TEMS for psychiatric emergencies (OR: 0.394, p<0.05). However, neither being accepted nor perceiving the application process as more fair were significant predictors of how likely someone is to call for TEMS over 911. Furthermore, perceived fairness of the application process was not a significant predictor of someone's likelihood of calling TEMS for different chief complaints.

When asked why they perceived the application process as being 'not at all fair' or 'unfair,' text responses fell into a few broad categories. The most common issues were perceptions of the application process as being 'surface level' or needing to know someone already in the organization to be accepted. Related to the perception of interview questions as surface level was the issue of discomfort during interviews. Some applicants cited the interview questions being 'personal' as a cause of discomfort, while others pointed toward a lack of POC representation in interviews and other selections events as well as concerns surrounding being heard during the group interview. The remainder of responses were generally related to the perceived advantage of EMT certified applicants over non-certified applicants.

Table 2: Predictive effects of variables on the likelihood of holding positive opinions of TEMS members. Values are odds ratios with parenthetical standard errors.

<i>Dependent variable:</i>	
	Positive index
Non-White	0.461 (0.490)
Non-Heterosexual	1.076 (0.465)
Non-Man	0.576 (0.376)
School Year	0.348*** (0.279)
On Campus	0.685 (0.619)
Application Fairness	2.414*** (0.169)
Not Accepted	0.297** (0.448)
Observations	112
<i>Note:</i> *p<0.05; **p<0.01; ***p<0.001	

Discussion

Despite acceptance status and perceived fairness of the application process lacking significance as direct predictors of the likelihood of calling TEMS over 911, unsuccessful applicants had significantly decreased odds of calling for TEMS during psychiatric emergencies. This is potentially important because 10-13% of the patients that TEMS treats have psychiatric complaints.

However, acceptance status and perceived fairness were significant predictors of positive opinions of TEMS members, as unsuccessful applicants had decreased odds of having positive opinions of TEMS members. Additionally, those who perceived the application to be more fair had increased odds of having positive opinions of TEMS members. This data could be useful, as it presents the need for improvement of TEMS' recruitment process and its influence on public perception.

Even though factors in these analyses may have had limited significance, they can still be used with the survey's qualitative results to inform general trends and issues that can be addressed to improve the public's perception of TEMS and therefore the health of the community. By making improvements to the recruitment process, we believe that TEMS can provide a higher quality of care that is accessible to all patient demographics of the Tulane community.

Recommendations

Based on the data gathered from the survey, we make the following recommendations to improve the recruitment process of TEMS:

1. Improve communication with applicants and explicitly confront applicant biases

We call upon TEMS to embrace transparency in regards to the recruitment process by addressing any presumptions of bias. Discrimination against women during the recruitment process was cited in the survey as a potential issue. The reasoning for this claim was the observation that TEMS' incoming EMT classes are generally split equally between male and female identifying individuals, even though the applicant demographics reveal a higher percentage of women. TEMS should confront these claims to counter any misconstrued information. Along with this, TEMS should explain the purpose behind the interview questions and what qualities they intend to evaluate in a prospective member. The interview questions have previously been perceived to be "irrelevant" or "surface level", with applicants expressing concern that they were not given a fair chance to convey their personalities. By explaining to applicants that the intention of these questions are to examine their level of commitment and ability to become an EMT, TEMS can properly address this issue.

2. Discontinue letters of recommendation

We also identified the issue perceived favoritism, and the perception that knowing a TEMS member will be advantageous during the recruitment process. TEMS should address this claim and communicate to applicants that knowing a TEMS member provides little to no advantage over an applicant who does not. In the interest of resolving this problem, we propose to discontinue letters of recommendation, while potentially keeping letters of dis-recommendation. If adopted, the discontinuation of letters of recommendation can only be effective in reducing the perception of favoritism if this change is effectively communicated with applicants.

3. Continue separation of EMT and non-EMT applicant pools

Our results support the continued separation of EMT certified and non-certified applicants during the recruitment process. Although a relatively recent change, selecting non-EMT applicants in the Fall and certified applicants in the Spring may increase the perceived fairness of the recruitment process. Alternatively, if both certified and non-certified applicants are being interviewed simultaneously, all potential new members must be informed of the differences in how EMT and non-EMT applicants will be evaluated. Non-certified applicants should be aware that they will not be compared to EMTs and vice-versa.

Final Thoughts

As a healthcare organization, the community's perception of us is far more than an issue of image or elitism; the community's perception of us is a public health issue. This survey has shed light on how public perception and application fairness can impact our service utilization by the Tulane community. These could potentially have negative consequences, as these data suggest that students may choose to not activate TEMS in their times of need. Our commitment to increasing transparency in the recruitment process, improving communication with potential new members, and ensuring an equitable experience for all applicants will make us a valuable health care resource on Tulane's campus. If we truly intend to provide quality patient care for all members of our community, we *must* make evidence based changes to improve internally.