Patient Attitudes Toward Remote Trauma Follow-up via Telehealth in Relation to Distance from Initial Trauma Center

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ABSTRACT

With a population density of under 20 people per square mile, and considering the vast majority of that population density is focused in Boise and Ada County alone, Idaho is very rural. Idaho is home to numerous counties with a population density below 1 person per square mile. The same trend continues in Alaska, Montana, and Wyoming- all with population densities under 10 people per square mile. When considering the importance of this study, a vital scenario to consider is the patient who is severely injured and life-flighted 250+ miles away to the closest trauma center in a metropolitan area such as Boise, and then discharged. Is it practical to expect this patient to return to the same hospital for follow-up care, albeit it may be multiple hours away by personal vehicle? Can follow-up trauma care be handed-off to a local healthcare facility within the rural community? Do rural patients prefer in-person follow-up visits with their physician even at the expense of driving hundreds of miles to reach the office, or is Telehealth a suitable compromise? Do patient attitudes on Telehealth vs. in-person follow-up care change depending on the severity of injuries? How do these attitudes change depending on the patient's support system at home or in their rural community? The use of a survey was used to give greater insight on trauma patients' attitudes towards Telehealth. The

results of these surveys are in the process of being evaluated and interpreted.

PURPOSE

We aim to determine the patient attitudes toward remote trauma follow-up care using telehealth services to increase the quality of post-traumatic care for patients living in rural areas of the Northwest and beyond. Trauma follow-up care is of utmost importance to patient health due to the risk of infection, disability, and other complications following severe injury and acute trauma care. For some patients living in rural areas, in-person trauma follow-up care can be difficult, and as such, the use of virtual telehealth medicine may be a possible solution for these cases. A study examining patient and clinician experiences with Telehealth used in instances of patient follow-up care suggest that virtual video visits are just as clinically effective and less expensive for both patient and provider compared with in-person visits *(Donelan K, et al)*.

The COVID-19 pandemic has increased the demand for virtual health care, allowing researchers to examine the effectiveness of Telehealth medicine and how it can be applied in the future as well. The COVID- 19 pandemic showed that Trauma-informed virtual care has the potential to ensure and even expand continuity of medical care, offer connection and support to trauma survivors, and enhance patient and clinician resilience in this time of need *(Gerber, Megan R, et al)*. The use of Telehealth during the pandemic allowed both patients and providers to experience the benefits and advantages of virtual healthcare and how it may be implemented in other instances. Through telehealth follow-up, we aim to lessen the barrier of distance preventing trauma patients from pursuing appropriate post-discharge care in the rural environment, leading to better health outcomes for trauma patients.

METHODS

Our approach to determining patient attitudes on preference for follow-up trauma care via Telehealth vs. in-person has been completed thus far via in-person delivery of surveys to stable trauma patients only. Stable patients are indicated by the patient's trauma physician on each day of survey delivery. The goal of the survey is to collect trauma patients' self-reported travel time to the trauma center

via personal vehicle from their home, along with their preference regarding Telehealth follow-up care. Patients are also given brief pre-selected multiple-choice options to indicate the most significant factor that caused them to elect their preferred choice. Patients will be given access to the survey in a medium of their choice, either a standard paper survey, or through scanning a QR code on their personal devices. This survey will be poised to determine their attitudes toward remote trauma follow-up care via Telehealth with the physician in charge of their trauma care plan. In most cases, this physician will be the patient's attending trauma surgeon. The patient's self-reported travel time from their residence to Saint Alphonsus Regional Medical Center, at 1055 N Curtis Rd in Boise, ID 83706 will be the only demographic collected for research purposes. We will not collect patient identifiers such as zip code or home address—only patient reported travel time to the medical center.

Using the self-reported travel times, patients will be placed into five different categories as seen in Figure 1.1: 0-30 minutes (I), 30-60 minutes (II), 60-120 minutes (III), 120-180 minutes (IV), and greater than 180 minutes (V). The self-reported travel time will be used to categorize the patients into groups to determine if the distance from the trauma center in which they received their initial trauma care has an impact on patient attitude toward pursuing follow-up care via online Telehealth.

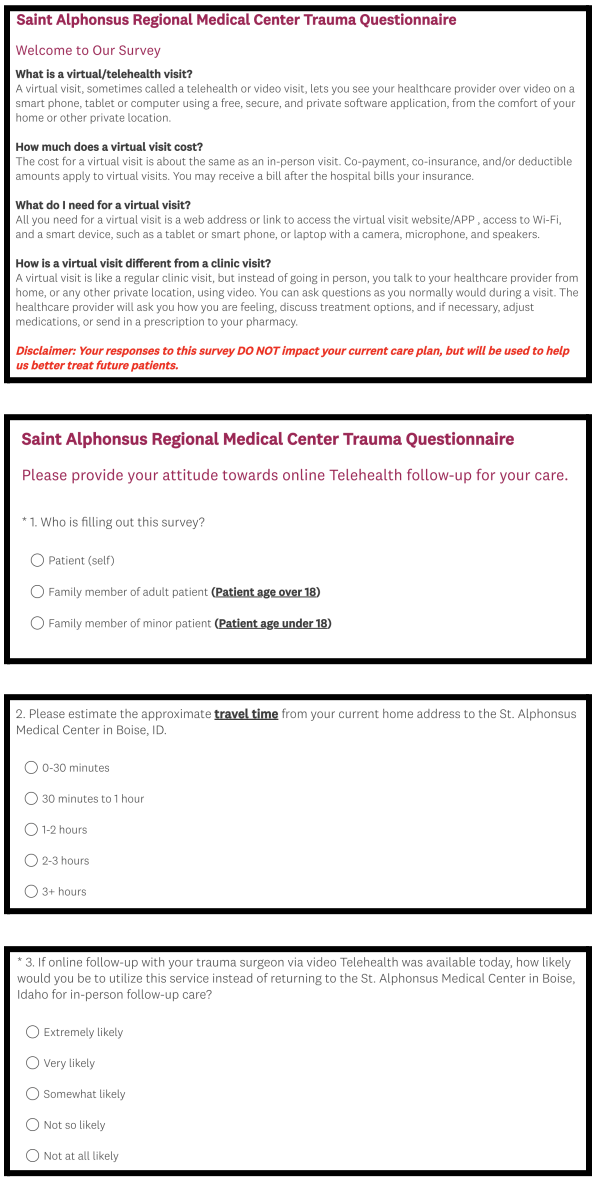
Patients can choose to answer the online survey provided as they near their discharge date, in which the investigators will then collect and compile the data into a de-identified document for record-keeping and result quantification. The online survey will be conducted via SurveyMonkey. For statistical validity, we aim for at least 100 patient responses per distance group to the survey questionnaire. This survey will take less than one minute to complete on average, as estimated by SurveyMonkey. The first question will be utilized to define which group the patient will be placed in based on their self-reported travel time. The second question will ask patients to rate their likelihood of following up with their initial trauma visit via Telehealth services. The included options will range from Extremely Likely, Very Likely, Somewhat Likely, Not so Likely, and Not at all Likely- with each option

assigned a numerical value of 5.0, 4.0, 3.0, 2.0, 1.0, respectively. Numerical values will be assigned to each response to allow for quantification of the data when interpreting survey results. To avoid introducing confounding variables, patients will not be shown the numerical values and will only have access to what is expressed in Figure 1.0. For example, a score of 1.0 indicates that a patient has a very small interest in their follow-up trauma care via online Telehealth, whereas a score near 5.0 would suggest a patient is very interested in follow-up trauma care via online Telehealth.

A secondary question, that will be triggered depending on the primary response to question #2, will allow us to determine the reason for the patient's decision when reporting their attitude towards Telehealth trauma care follow-up. By allowing patients to respond with the reasoning for their reported attitude (either positive or negative), researchers can avoid potential assumption bias that patient attitude is based solely on their home travel distance from the trauma center.

Data will be safely stored within the SurveyMonkey online cloud and will be analyzed via a spreadsheet export for statistical accuracy. The survey used in the design and delivery of this study does not pertain to, nor does it store any pertinent healthcare information (PHI).

FIGURE 1.0- Trauma Survey Questionnaire



Saint Alphonsus Regional Medical Center Trauma Questionnaire

Welcome to Our Survey

What is a virtual/telehealth visit?
A virtual visit, sometimes called a telehealth or video visit, lets you see your healthcare provider over video on a smart phone, tablet or computer using a free, secure, and private software application, from the comfort of your home or other private location.

How much does a virtual visit cost?
The cost for a virtual visit is about the same as an in-person visit. Co-payment, co-insurance, and/or deductible amounts apply to virtual visits. You may receive a bill after the hospital bills your insurance.

What do I need for a virtual visit?
All you need for a virtual visit is a web address or link to access the virtual visit website/APP , access to Wi-Fi, and a smart device, such as a tablet or smart phone, or laptop with a camera, microphone, and speakers.

How is a virtual visit different from a clinic visit?
A virtual visit is like a regular clinic visit, but instead of going in person, you talk to your healthcare provider from home, or any other private location, using video. You can ask questions as you normally would during a visit. The healthcare provider will ask you how you are feeling, discuss treatment options, and if necessary, adjust medications, or send in a prescription to your pharmacy.

Disclaimer: Your responses to this survey DO NOT impact your current care plan, but will be used to help us better treat future patients.

Saint Alphonsus Regional Medical Center Trauma Questionnaire

Please provide your attitude towards online Telehealth follow-up for your care.

* 1. Who is filling out this survey?

- ◯ Patient (self)
- ◯ Family member of adult patient **(Patient age over 18)**
- ◯ Family member of minor patient **(Patient age under 18)**

2. Please estimate the approximate **travel time** from your current home address to the St. Alphonsus Medical Center in Boise, ID.

- ◯ 0-30 minutes
- ◯ 30 minutes to 1 hour
- ◯ 1-2 hours
- ◯ 2-3 hours
- ◯ 3+ hours

* 3. If online follow-up with your trauma surgeon via video Telehealth was available today, how likely would you be to utilize this service instead of returning to the St. Alphonsus Medical Center in Boise, Idaho for in-person follow-up care?

- ◯ Extremely likely
- ◯ Very likely
- ◯ Somewhat likely
- ◯ Not so likely
- ◯ Not at all likely

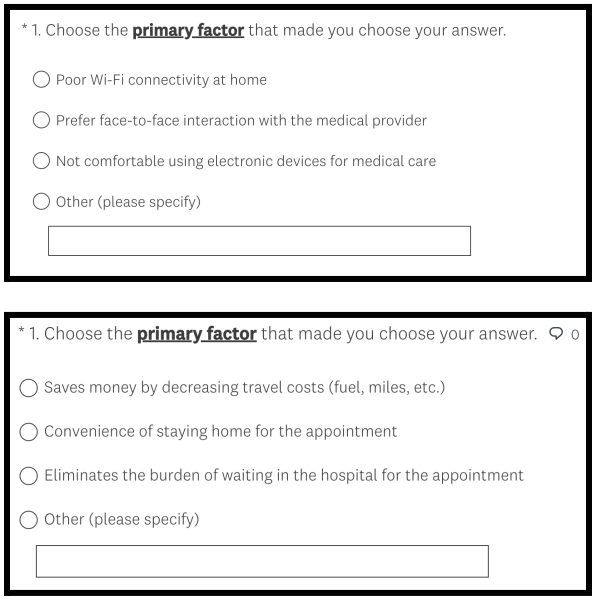


FIGURE 1.0 *The trauma study questionnaire via SurveyMonkey, will be distributed to trauma patients from the Saint Alphonsus Regional Medical Center in Boise, ID, via an electronic tablet. Each answer will be given a predetermined numerical weight for result quantification. In addition, we plan to ask follow-up questions to categorize each patient's reasoning, depending on their reported attitude toward Telehealth for trauma follow-up (positive or negative). "Extremely likely" and "Very likely" will be ranked as positive responses. "Somewhat likely", "Not so likely", and "Not at all likely" will be ranked as negative responses, and the associated secondary question will be triggered using the Logic feature on SurveyMonkey.*

The active survey can be reached directly using this link:

https://www.research.net/r/StAlsRMCTelehealthSurvey

STUDY POPULATION

The patient population included in the survey will also be limited to trauma patients from the Saint Alphonsus Regional Medical Center in Boise, Idaho. Our sample size consisted of 42 trauma patients (n=42). Our exclusion criteria include patients under the age of 18 years, unless the survey questionnaire is being completed by a parent or legal guardian. Any patient over the age of 18 years being discharged from the Saint Alphonsus Regional Medical Center in Boise, Idaho following services from the Saint Alphonsus Trauma Center *(including, but not limited to: consultation, in-patient surgery, out-patient surgery, office visits, etc.)* are considered "eligible" to be included in this study.

RESULTS

In the study, patient respondents within the extended distance categories (II, III, IV, V) demonstrated robust positive preferences toward Telehealth follow-up care. Among respondents residing more than 30

minutes from the trauma center, a significant majority (76.2%) expressed attitudes of at least "Somewhat Likely" to prefer Telehealth follow-up over traditional in-person follow-up at the hospital. Similarly, among respondents residing within a 30-minute radius of the Trauma Center, an overwhelming 81% indicated preferences for Telehealth follow-up.

Moreover, the study delved into the individual reasoning behind each patient's selected attitude. Notably, 50% of patient respondents in favor of Telehealth follow-up cited the convenience of staying home as the primary factor influencing their decision. Another substantial portion, 31% of respondents, highlighted the desire to save on travel costs as a motivating factor for preferring Telehealth follow-up care over in-person follow-up visits to the hospital. These findings underscore the multifaceted benefits perceived by patients in opting for Telehealth services, ranging from convenience to financial savings.

DISCUSSION

We formulated the hypothesis that there exists a positive correlation between patient travel time from the Trauma Center, specifically Saint Alphonsus Regional Medical Center in Boise, ID, and the preference for pursuing Telehealth follow-up care. We predicted that as the distance of patients' homes from the trauma center increases, their inclination towards electing Telehealth follow-up care would also increase. This expectation is rooted in the assumption that patients residing farther away, particularly in rural areas, are more likely to opt for Telehealth due to longer travel times and limited access to in-person medical services. We expected that patients who indicated substantial travel times to the trauma center (defined as greater than 30 minutes) were more likely to reside in rural areas, as most large population centers across the nation have access to trauma centers within a shorter travel time.

Surprisingly, preliminary results suggest that there is a positive patient preference towards Telehealth follow-up care within all distance categories from the trauma center, not just among rural patients living at increased distances from the trauma center. This finding was not expected and suggests that Telehealth is preferred by most patients in general if available—not just by patients

with an extended/inconvenient travel time to the trauma center. Understandably, patients may find it exceedingly difficult to return to the trauma center for follow-up care by standard personal vehicle with immobilized injuries, wound vacs, etc., regardless of travel time. Our findings suggest that urban trauma centers serving distant rural communities across the Western U.S. may benefit from offering Telehealth follow-up to all eligible trauma patients, regardless of their specific travel time to the trauma center. Going forward, we aim for a survey response rate of at least 100 patient participants by 2024 to more precisely analyze and interpret the attitudes of our patient population.