academic institutions and organizations participating in clinical care and education in resource-limited communities.

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Patient perceptions of EMS provider attire

In a health-care landscape driven by patient satisfaction and quality assurance, preferences towards provider attire has become a topic of interest. Uniforms afford clues for personnel identification [9]; research demonstrates attire impacts patient preferences for both nurses and physicians in multiple settings [1-3,10]. One meta-analysis concluded that while patients do prefer formal physician attire, perceptions are influenced by location, setting and context of the care provided and recommends health systems study attire in specific care locations to better tailor provider attire to patient preference [4]. In emergency settings, some research has demonstrated preferences for certain attire worn by physicians [1,10]. Two other studies have examined patient's perception of physician performance in an emergency department (ED) setting; both concluded patients did not have a preference between formal clothes and scrubs; patients did however express a belief that physician attire was important [6,8].

EMS personnel are the first points of contact with patients in need of intervention; EMS teams rely on trust for effective and successful responses. This prospective study addresses how EMS attire influences patient perception of care through five different variables: likeability, trust, confidence, willingness to confide, and intelligence. We hypothesized that uniforms lead to increased patient awareness and establishment of trust but should not influence perceived quality of care. This survey addresses how patients perceive EMS attire using an assessment of providers responding to a patient in video simulations.

Over six weeks in the fall of 2016, 165 surveys were completed evaluating a team of two EMS providers at the Penn State Hershey Emergency Room. Participants surveyed viewed one of three two-minute videos of an EMS team responding to a patient with chest pain. In each video EMS personnel wore one of three distinct outfits: a blue tee shirt, a white button-up shirt or turnout gear. These attires were selected as they were felt to be those most commonly worn by EMS staff at Penn State.

In each video, a paramedic and EMT responded to a standardized patient complaining of chest pain. In each video the setting, script, expressions and actions of the actors were standardized to the best of their abilities. In each script the EMS personnel attached an EKG, auscultated the patients' heart and lungs and placed him on a nasal cannula.

After viewing one of the three videos, participants subsequently completed a five-question survey addressing the providers on a five-

point Likert scale. Additionally, participants were asked if they believed EMS provider attire was important. Likert scale questions included in the survey were as follows:

- How confident are you in this provider?
- How smart is this provider?
- How willing are you to discuss confidential information with this provider?
- How trustworthy is this provider?
- How likeable is this provider?

Responses from the 165 completed surveys were compared using a two tailed non-parametric equivalent of an ANOVA. Results were compiled in REDCAP and exported to statistical programs for data analysis.

Of 165 surveys completed, 87.5% of responders rated EMS attire as important. No differences in responses were found related to patient age, gender or specified ethnicity. Likert data analysis showed no significant differences with respect to perceived provider trust, smartness, likeability or confidence. Participants answered significantly lower in willingness to discuss confidential information in the turnout gear compared to the other two attires at an alpha of 0.0057. Figs. 1–4 show the results for the other questions of on our survey. The mean response for providers in turnout gear was lower across all questions on the survey; these results were not significant at our sample size.

Based on our results, EMS provider attire does not impact patient perceived quality of care. Across all the surveys, lower responses were found for turnout attire, possibly from poor association of EMS providers and response to fires. The setting of the videos- in response to a non-fire related chief complaint, could have affected the responses. Based on the final survey question, patients do seem to find attire as important but the attires we assessed did not affect how the providers were perceived.

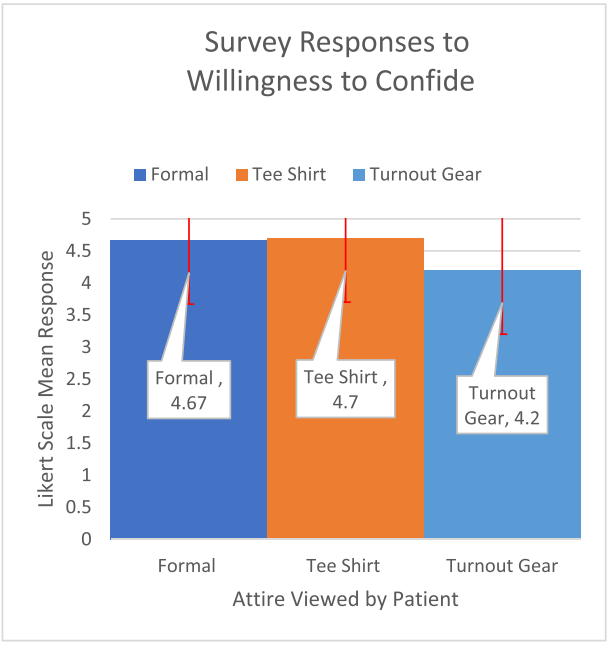

Fig. 2. Distribution for survey results regarding willingness to disclose confidential information. Participants surveyed were less likely to disclose confidential information to EMS personnel in Turnout Gear. This was our one significant result with a P value = .0057.

Factors that could further confound our results were the location and setting where the study was performed. Studies in non-rural Emergency Rooms or those were providers wear more formal attire regularly may could potentially influence our outcomes. This study was limited by the small sample size and number of attires utilized. Studies drawing

Fig. 1. Three different attires used in the filming of the videos. Attire 1 is a simple tee shirt and BDU pants, Attire 2 is a white more formal button down and BDU pants, Attire 3 is fire turnout gear.

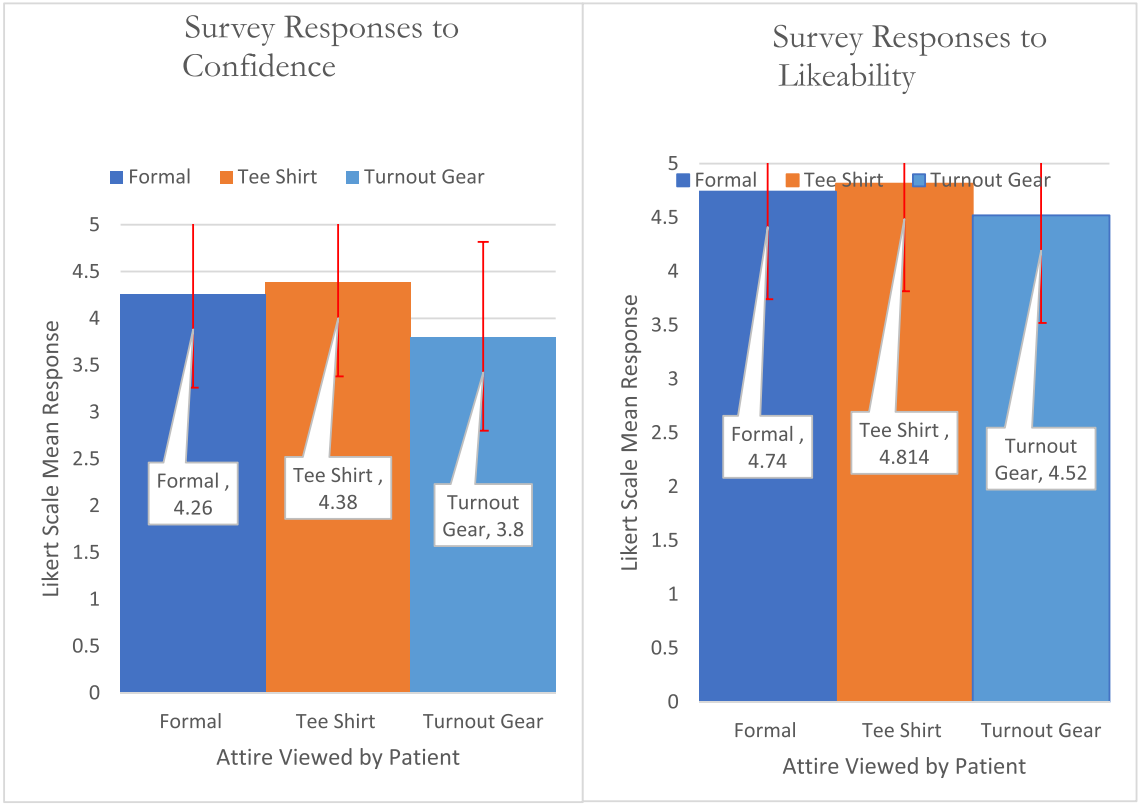

Fig. 3. Distribution for survey results regarding EMS provider confidence and Likeability. Participants surveyed were less likely to have confidence or like providers wearing turnout gear. Neither of these results was significant. With P values > .05.

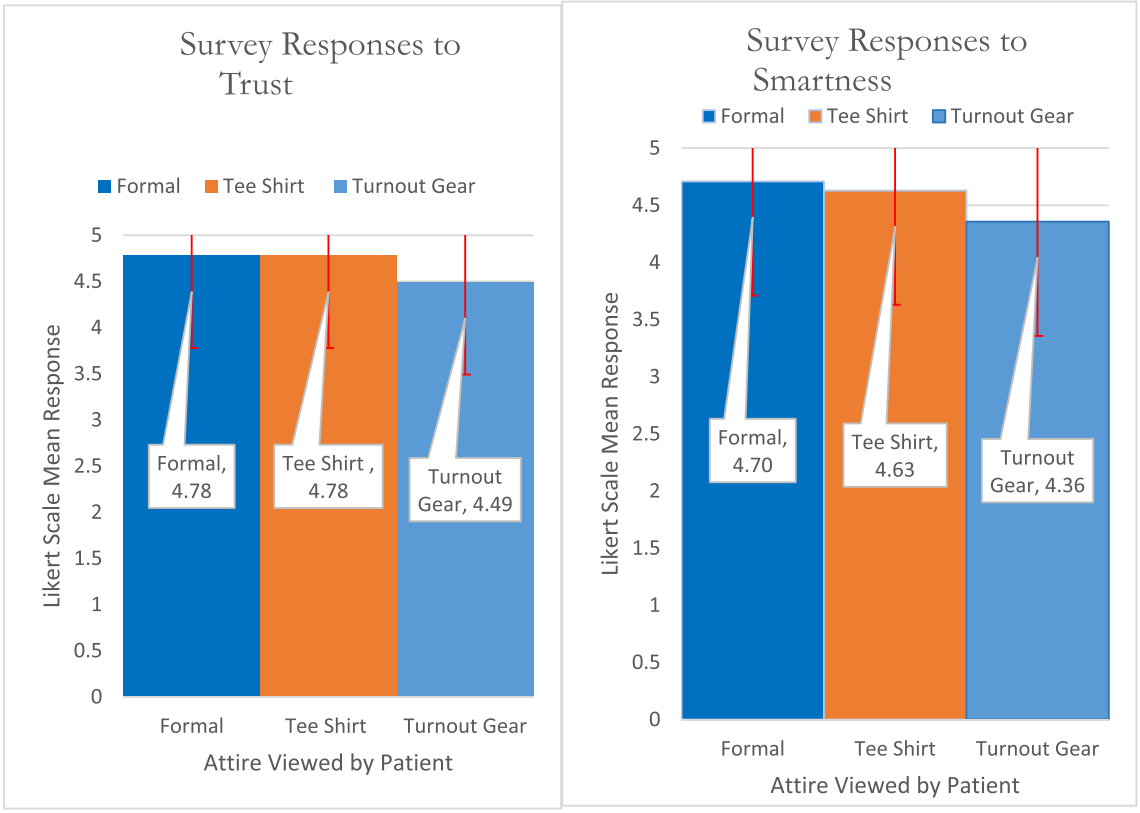

Fig. 4. Distribution for survey results regarding EMS provider Trust and Smartness. Participants surveyed were less likely to think EMS providers wearing turnout gear were trustworthy or smart. Neither of these results was significant. With P values > .05.

a larger sample, and those that more aspects of provider appearance would lend support to this conclusion. Future research should look to analyze EMS attire in response to different scenarios- not just a low acuity patient with chest pain. Our study was small, and limited by the number of outfits tested but our results conclude attire as a minor factor in EMS responses.

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RN assessment of the inferior vena cava diameter to determine intravascular volume using bedside ultrasound☆

Of the roughly 750,000 annual cases of sepsis, 220,000 patients will die. Costing approximately 17 billion dollars yearly, sepsis adds a momentous cost to healthcare [1]. At $18,400 per diagnosis, sepsis is double the average cost when compared to the average hospital stay [2].

At a large urban hospital in southern California, a Sepsis Committee evaluates patient fallouts quarterly. A fallout is defined as a patient who fails to receive all required interventions from the Centers for Medicare and Medicaid Service's (CMS) 2015 Sepsis Core Measure (SEP-1) Bundle [3].

The indication for this evidenced-based practice (EBP) change was discovered when a quarterly Sepsis Mortality Report revealed a 13.3% mortality rate. As a result, a 12-month gap analysis was conducted. The analysis revealed most septic patients failed to receive the initial 30 ml/Kg intravenous (IV) crystalloids bolus required by the SEP-1 bundle. Many physicians did not prescribe the required initial IV bolus for severe septic patients with comorbidities since they assumed the excess IV fluids would cause pulmonary overload, abdominal hypertension or other complications. Moreover, the fluid status of these patients was not assessed either. Research has shown measuring the collapsibility of the inferior vena cava (IVC) allows providers to quickly assess if septic patients would be responsive to additional fluids [4]. Moreover, measurement of the IVC using bedside ultrasound (BUS) has proven accuracy compared to traditional invasive measurements, is non-invasive, inexpensive, and easily trainable [5,6].

The PICO question for this study was: Would a nurse's bedside ultrasound IVC assessment to evaluate intravascular volume status, compared to current practice, result in more effective and timely delivery of the appropriate amount of IV fluids for severe septic patients?

This project was designed to train 26 Rapid Response Team (RRT) Register Nurses (RN) to measure septic patients' IVC using BUS. Each nurse underwent an hour-long verbal instruction and was to complete a minimum of 10 IVC assessments with an echocardiology technician (echo tech). Inclusion criteria for this study were all spontaneously breathing patients 18 years old and older diagnosed with severe sepsis in the ED and met the SEP-1 criteria. The evidence-based benchmark used for this project was the CMS Sepsis Core Measure (SEP-1) 2015 Bundle and the national average of SEP-1 compliance regarding initial fluid bolus administration, which is 55.2% [7].

Due to time restraints, only three RRTs were fully trained to perform IVC measurements. To that extent, the control chart displays the results of this study (Fig. 1). There is an, undesirable downward trend from February to March 2017. There are desirable data points in May and December 2017 as a result of hospital leadership recognizing the previous downward trend. Noteworthy, this was also the only time the hospital was above the national average for SEP-1 compliance. The desirable point in December 2017 was likely due to the anticipation of this study.

The control chart (Fig. 1) shows the post-intervention mean slightly increased to 38% from 33% with slight movement toward the desirable side. Additionally, the upper and lower control limits post-intervention are moved closer together; however, there was no significant improvement in the number of septic patients who received the 30 ml/kg IV bolus.

The cost of completing this EBP change would be significant. The average time to train each of the 26 RRT nurses is approximately 17 h. With the average hourly wage of an RN at $48.68 [8] and $42.00 per hour for an echo tech [9], it would cost $40,081 in hourly wages to pay for this practice change. Additionally, an estimated 442 echocardiograms would be deferred and cost $260,780 in lost revenue [10]. Overall, the cost of initial training would be $300,861. To avoid exorbitant costs, it would be more beneficial to hire a new full-time “ED Sepsis Nurse” with the primary role of sepsis management in the ED. The estimated cost of a new ED Sepsis Nurse is $100,000 per year [9]. This recommendation would equate to a 200% return on investment. Moreover, annual refreshers training for the RRTs is estimated at $140,402 per year.

The most significant barrier for this project was the lack of time to train personnel. Only one echo tech was available to instruct all 26 RRTs. Education was also impeded because the RRT nurses would respond to calls during training. Moreover, only one US machine was available.

While the results of this study did not demonstrate the significant impact on septic patients, it reveals shortfalls with attempts to implement such a considerable practice change without sufficient resources. Future investigators can appreciate the complexity of this change and use the findings to improve their study. This innovative EBP change offers RNs the knowledge, autonomy, and skills to identify septic patients early and implement life-saving interventions rapidly. It also increases compliance with the Joint Commission's 2015 Sepsis Core Measure (SEP-1) Bundle [11] and could potentially reduce mortality.

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