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The Effects of Debriefing Methods on Athletic Training Students’ Self-Efficacy

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The Effects of Debriefing Methods on Athletic Training Students’ Self-Efficacy

Abstract
Purpose: Simulation-based education is a teaching method used successfully in nursing and medical education, as well as in the military and aviation fields. It provides students with safe learning environments and opportunities to practice skills not seen or used during clinical rotations. Debriefing is an essential component of simulation where learning occurs while also fostering critical thinking, clinical reasoning, and promoting self-efficacy with clinical skills. However, the evidence rarely indicates which debriefing method is best at increasing clinical evaluation skills self-efficacy. The purpose of this study was to compare the effects of debriefing methods on students’ clinical evaluation self-efficacy. Methods: In this quasi-experimental, retrospective pretest-posttest study the researcher explored the effect of four common debriefing methods on students’ clinical evaluation self-efficacy. Using the Confidence Rating Scale, the researcher collected students’ self-efficacy scores before and after a simulated experience with debriefing through an online survey that was distributed to current athletic training students. Results: The analysis did not find any statistically significant relationship between the type of debriefing method and pretest self-efficacy. There were also no statistically significant relationships found between the type of debriefing and students’ pretest to posttest changes in self-efficacy. Conclusions: The literature recognizes that debriefing is the component of simulation where learning occurs, but there remains minimal research on which debriefing method is the best at increasing students’ self-efficacy.

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The Effects of Debriefing Methods on Athletic Training Students' Self-Efficacy

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ABSTRACT

Purpose: Simulation-based education is a teaching method used successfully in nursing and medical education, as well as in the military and aviation fields. It provides students with safe learning environments and opportunities to practice skills not seen or used during clinical rotations. Debriefing is an essential component of simulation where learning occurs while also fostering critical thinking, clinical reasoning, and promoting self-efficacy with clinical skills. However, the evidence rarely indicates which debriefing method is best at increasing clinical evaluation skills self-efficacy. The purpose of this study was to compare the effects of debriefing methods on students' clinical evaluation self-efficacy. Methods: In this quasi-experimental, retrospective pretest-posttest study the researcher explored the effect of four common debriefing methods on students' clinical evaluation self-efficacy. Using the Confidence Rating Scale, the researcher collected students' self-efficacy scores before and after a simulated experience with debriefing through an online survey that was distributed to current athletic training students. Results: The analysis did not find any statistically significant relationship between the type of debriefing method and pretest self-efficacy. There were also no statistically significant relationships found between the type of debriefing and students' pretest to posttest changes in self-efficacy. Conclusions: The literature recognizes that debriefing is the component of simulation where learning occurs, but there remains minimal research on which debriefing method is the best at increasing students' self-efficacy.

Keywords: Simulation-based education, Athletic Training, Self-Efficacy, debriefing methods
INTRODUCTION

For decades, producing confident and competent athletic trainers has been a goal of athletic training education programs. With the profession moving to entry-level master’s programs, new competencies and an increased focus on first-time Board of Certification (BOC) pass rates, athletic training (AT) program educators need to develop and nurture self-efficacy in clinical evaluation skills. By developing self-efficacy in clinical evaluations skills, programs can produce self-efficacious clinicians and increase patient care and increase patient-reported outcomes. The Commission on the Accreditation of Athletic Training Education (CAATE) 2020 standards allow for the use of simulation-based education (SBE) to account for those clinical scenarios that may not be experienced during students’ clinical education. There has been little emphasis in athletic training education on debriefing methods following simulation despite the current literature showing that debriefing is considered one of the most important components of SBE. Understanding the debriefing method that supports self-efficacy in athletic training students’ clinical evaluation skills will benefit athletic training curriculums in producing confident, athletic trainers.

Self-efficacy is a person’s belief in their ability to learn or perform actions to produce or attain a specific result. Self-efficacy is not the same as self-esteem which is the judgment of self-worth, or locus of control which is the belief that outcomes result from behavior or extraneous forces. Self-efficacy is one’s belief that they are capable of learning or performing skills such as clinical evaluations skills and is considered a key motivational process. A person’s belief influences their choice, effort, and persistence of tasks. Bandura proposes that self-efficacy is formed through acts of self-appraisal and is usually formed before task demands. Self-efficacy reflects self-confidence in an individual’s ability to control their motivation and behaviors. Self-confidence refers to the strength of a person’s belief. Self-efficacy is not only concerned with the skills individuals have but with the judgments they can make with the skills they have. It postulates that those with high self-efficacy are more likely to try a task and persist longer than those with lower self-efficacy. Individuals with high levels of self-efficacy are more likely to set challenging goals and maintain a high commitment to meeting those goals.

A key component of SBE is the debriefing process. However, research on the effectiveness of debriefing methods on students’ self-efficacy with clinical evaluation and non-clinical skills remains inconclusive. Debriefing is a process conducted in conjunction with a simulation experience where students can reflect on and critique their performance on their simulation experience. Despite this, there remains a need to research which type of debriefing method is most effective in increasing students’ clinical evaluation self-efficacy.

Debriefing is considered an essential part of the simulation process and is widely used in nursing education. Debriefing has been regarded as the part of the simulation experience where most of the learning occurs. It allows students to reflect on their performance critically and objectively during the simulation and provides students with an opportunity to analyze their technical skills and thoughts, ideas, and emotions. Debriefing helps create a factual mental account of what happened during the simulation experience and whether participants’ responses during the simulation were appropriate. It is designed for students to identify gaps in their knowledge and performance and provides an opportunity for them to accurately assess their total performance. The debriefing process allows students to identify and justify their actions during the simulation and determine any steps they would potentially change if presented with a similar simulation in the future. The debriefing process also allows students to reflect on their emotions during a simulation experience and how their actions impacted patient outcomes. For debriefing to be an effective learning tool, educators need to plan how and when debriefing will occur, provide a pre-briefing session that explains the rules and expectations of the simulation experience, and allow participants to share their emotional reactions and provide for deep reflection.

Debriefing can occur at different times throughout the simulation event, such as during the event, immediately after, or 24 hours post-event. While debriefing is considered a type of feedback, the two terms have different connotations even though they are used interchangeably in literature. Feedback is a one-way conversation where facilitators typically deliver comments to students without discourse between the two parties. Debriefing has been described in the research as a bidirectional conversation between facilitators and students, allowing for student reflection and knowledge testing. It is considered a collaborative conversation that allows learning to occur between both the facilitator and the student.

Debriefing remains a poorly understood process in simulation-based education. There are numerous types of debriefing techniques that can be utilized with simulation exercises. Some common types of debriefing are instructor-led, video-assisted, peer-facilitated, and self-debriefing. While research has shown that simulation increases clinical evaluation skill self-efficacy in athletic training education, little research focuses on which debriefing method effectively increases students’ clinical evaluation self-efficacy. Debriefing has been regarded as the part of the simulation experience where most of the learning occurs. It allows students to critically and objectively reflect on their performance during the simulation and provides students with an opportunity to analyze their technical skills and thoughts, ideas, and emotions.
account of what happened during the simulation experience and whether participants’ responses during the simulation were appropriate.\textsuperscript{7} It is designed for students to identify gaps in their knowledge and performance and provides an opportunity for them to accurately assess their total performance.\textsuperscript{12} The debriefing process allows students to identify and justify their actions during the simulation and determine any steps they would potentially change if presented with a similar simulation in the future.

Understanding how debriefing methods affect students' clinical evaluation skill self-efficacy will allow athletic training educators to implement the most effective methods in their programs. Producing self-efficacious clinicians with their clinical evaluation skills will help with improving patient treatment and increasing patient-reported outcomes.

**Instructor-led Debriefing**

Instructor-led debriefing is referred to as the traditional debriefing method and is the most widely used.\textsuperscript{21,34} This debriefing method is facilitated by a professional trained in debriefing techniques who guides the debriefing session as necessary. Trained facilitators can observe the positive and negative aspects of student performance during simulation exercises and guide the exercise without criticizing student decisions or performance.\textsuperscript{21,29} Instructor-facilitated debriefing has been shown to increase psychomotor and communication skills, self-confidence, and the development of technical and non-technical skills.\textsuperscript{6,21} More advanced students may benefit from instructor-led debriefing.\textsuperscript{35} Instructor-led help students recognize what is happening during the simulation experience and identify any problems that may have developed while helping them realize what the experience meant to them.\textsuperscript{29} They help with identifying any obstacles students may have faced, what they may have done well or not and what they might do differently next time.\textsuperscript{29} Instructor-led debriefing should allow time for self-reflection for students to determine how they can prepare for future simulation experiences.\textsuperscript{21,29} The time needed to properly train debriefing facilitators and the time required for debriefing exercises at institutions with a large number of students can be seen as a challenge for this type of debriefing.\textsuperscript{34}

**Video-Assisted Debriefing**

Video-assisted debriefing (VAD) uses video playback to support the debriefing process, while instructor-facilitated is faculty-led group discussions.\textsuperscript{5,10,19,36,37} Levett-Jones and Lapkin report that VAD is considered the "gold standard," however, the current research is inconclusive on this.\textsuperscript{38} Ostovar et al found that both instructor-facilitated and VAD can improve technical and non-technical skills such as self-confidence and reported no statistical significance between instructor-facilitated and VAD.\textsuperscript{21} According to Ali and Miller, VAD may not produce a significant advantage over other debriefing methods.\textsuperscript{19} Later research conducted by Zhang et al found that debriefing methods such as VAD improved learning outcomes compared to instructor-facilitated and maximized learning without causing increased stress. However, insufficient evidence shows which debriefing method improves self-efficacy, problem-solving, or critical thinking during simulation.

Video-assisted debriefing includes the use of audiovisual recordings of students' performance.\textsuperscript{5,21,39} Typically, only certain segments of a student's performance are shown during the debriefing exercise, which allows for quicker response and provides a visual reinforcement for students.\textsuperscript{21,29} Students can watch their performance which promotes self-reflection and provides students with the opportunity to see how they performed instead of how they think they performed.\textsuperscript{29} Some of the negative aspects of VAD include type and quality of the video can affect students' learning, selection of video segment is vital for learning, the time needed to review the video, knowledge of audiovisual equipment by the facilitator can affect learning, mental fatigue, cognitive overload, and it can be seen as a distraction from facilitator's comments.\textsuperscript{5,40} There are some positive components to VAD reported in the literature. These include students being able to draw connections between theory and real-life, becoming more aware of themselves, and feeling encouraged and motivated to participate in the reflection and debriefing process.\textsuperscript{29} Another positive aspect of VAD is that it limits recall bias by preventing failure to recall specific things that happened during the simulation experience.\textsuperscript{19}

**Peer-Facilitated Debriefing**

Peer-facilitated debriefing is a method performed by a student or member of a team and can be done in a written or observed format.\textsuperscript{34,41} It is considered a reflective process that provides information and behaviors that instructors may overlook.\textsuperscript{34} The individual conducting the peer-facilitated debriefing should have the same educational comprehension as the students participating in the simulation experience.\textsuperscript{42} Peers provide an objective view of the simulation experience by observing students while giving overall feedback and reflecting on the strengths and weaknesses of other students' simulation performance.\textsuperscript{43} Research has shown that peer-facilitated debriefing results in more active student engagement and higher levels of motivation towards learning and has been shown to increase self-confidence among students.\textsuperscript{34}

There have been numerous benefits reported in the literature on peer-facilitated debriefing. It promotes team building, good communication skills, and increased self-confidence.\textsuperscript{34,43,44} Mirjalli et al found that peer-facilitated debriefing decreased student anxiety and provided a comfortable and non-threatening learning environment.\textsuperscript{45} Other positive effects of this type of debriefing
are that it improves cognitive load while producing a greater number of positive emotions and fewer negative emotions. Peer-led debriefing does not have the costs tied to it that instructor-led or video-assisted do.

There are some negatives or concerns of peer-facilitated debriefing reported in the literature. Verkuyl et al. found that the effects may differ depending on students’ ability to reflect on and criticize their peers’ experiences. There may also be favoritism shown to friends of peer debriefer. They also reported that peer-facilitated debriefing may be more effective for health care professionals instead of students.

Self-Debriefing
Self-debriefing is an alternative debriefing method that can be used when other forms are not feasible. This type of debriefing can be defined as a written activity performed individually where the learner responds to a series of questions designed to facilitate the learners’ reflection of a simulation. This type of debriefing can be performed as a stand-alone method or in conjunction with group debriefing. The debriefing exercise can be designed where students answer structured questions about their performance and experience before they participate in a group debrief, or the debriefing can be designed where students only answer structured questions and do not participate in a group debrief. When self-debrief is combined with a group debrief, it provides the ability for facilitator and student dialogue, but when it is used alone it lacks this ability.

Self-debriefing encourages self-assessment and allows students to participate in deep, authentic reflection without peer influence. It gives students a systematic process that is achieved by answering open-ended questions and filling out a checklist. Self-debrief allows students to analyze their decision-making without being influenced by other students or facilitators while reflecting on the simulation experiences that reverberate with them. Self-debriefing is a self-paced form of debriefing that can be completed immediately after a simulation experience while the experience and any emotions associated with it are still current. A study conducted by Maclean et al showed that self-debriefing resulted in high levels of self-confidence and self-awareness. Other studies show that self-debriefing improves knowledge and effectiveness as much as other methods.

There are several benefits to self-debriefing. One of those advantages is the ability to conduct the debriefing anywhere and at any time, as it does not require the presence of a facilitator. This can be seen as a cost-saving measure as institutions do not need to have facilitators and facilities available for students to complete their debriefing.

Along with the many benefits of self-debriefing, there are also some challenges to this method. One of the challenges of this method of debriefing is the motivation and commitment of students to engage in and complete the self-debriefing. Verkuyl et al. found that students in the self-debrief group spent the least amount of time on their questions and used fewer resources to complete the debrief, and it led to a less satisfactory debriefing experience.

Research Questions
The following research questions guided this study.

- Is there a difference between the type of debriefing method used on reported pretest clinical evaluation skill self-efficacy among athletic training students?
- Is there a difference between the type of debriefing method on male and female students’ reported pretest to posttest self-efficacy scores on clinical evaluation skills among athletic training students?
- Is there a difference between the debriefing method and the level of students in a program on reported pretest to posttest changes in clinical evaluation skill self-efficacy among athletic training students?
- Is there a difference between the type of debriefing method and the debriefers’ gender on reported pretest to posttest changes in clinical evaluation skill self-efficacy among athletic training students?
- Is there a difference between the debriefing method on reported pretest to posttest changes in clinical evaluation skill self-efficacy among athletic training students?

METHODS
The four independent variables chosen for this study are debriefing methods following a simulation experience, athletic training students’ gender, programmatic level, and debriefer gender. The dependent variable is athletic training students reported clinical evaluation skill self-efficacy. A quantitative research method was appropriate for this study because it was designed to find statistical evidence that a relationship existed between independent and dependent variables. This method allowed for statistical measurement of the variables by analyzing survey responses from research participants using a validated scale. The participants used a Likert scale to answer the survey items. Self-administered surveys are widely used in medical education research. Non-observable constructs like self-efficacy are difficult to measure with a single item on a survey and typically require a survey scale.

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Self-efficacy can be validated by a quantitative approach using self-reported surveys. A quantitative method provided the ability for an objective measurement of the study's variables that may allow athletic training educators to determine which debriefing method may increase students' self-efficacy clinical evaluation skill self-efficacy following a simulation experience.

Research Design
A quantitative study using a quasi-experimental retrospective pretest-posttest research design was used to determine if there are relationships among debriefing methods, participants' gender, programmatic level, debriefer gender, and self-efficacy among athletic training students. The participants for this study were athletic training students enrolled in a bachelor-of-science, professional master's, or post-professional master's program. A convenience sampling method was used to select participants for this study. Participants' inclusion criteria included athletic training students, athletic training student members of the NATA, male, female, or non-binary, with debriefing experience and who are currently enrolled in bachelor-of-science, professional masters, or post-professional masters. Exclusion criteria were students without debriefing experiences and those not currently enrolled in a program.

Instruments
Armstrong and Jarriel's Confidence Rating Scale was used to collect participants' self-reported self-efficacy in this study. This scale contains 17 items scores on a five-point Likert scale, scoring "1= strongly disagree, 5 = strongly agree." Face and content validity were established by five (two from AT, three from nursing) content experts using standardized patients. Internal consistency was determined by measuring reliability using Cronbach α. The α coefficient was 0.971. Data was collected using the National Athletic Trainers’ Association (NATA) Research Survey Service and CAATE’s list of program directors’ emails. Participants utilized a self-reported survey to collect demographic data and information on the debriefing method experienced following a simulated situation, along with self-efficacy.

Data Analysis
In arriving at a final sample size, 109 individuals opened the electronic survey. However, 52 of these participants provided little or no data and were excluded from the potential sample as they did not complete a single item regarding the self-efficacy measures. This left 57 individuals in the sample for this study. Of these 57 participants, two were excluded for missing data. One provided only nine responses on the pretest self-efficacy measure, and one did not provide responses to the posttest self-efficacy measure. Thus, the final sample consisted of 55 study participants. Among these 55 study participants, one evidenced a missing item on the pretest self-efficacy measure, and one evidenced a missing item on the posttest self-efficacy measure. The mean score of valid items for each participant was used at each timepoint to address the missing item. Lastly, seven study participants did not report the gender of the debriefer. The analysis was completed with the available data (n=48).

The latest version of SPSS (28.0) was used for all statistical analyses. The data analysis plan consisted of three phases. First, all study variables were presented using descriptive statistics, such as means, standard deviation, and minimum/maximum values for continuous variables (Interval/Ratio level) and frequencies and percentages for categorical variables (Nominal/Ratio level). These analyses are found in Tables 1 and 2.

The second step of data analysis was a bivariate analysis. In this phase, bivariate tests, including Independent Samples t-Test and One-Way Analysis of Variance (ANOVA), were used to determine if explanatory covariate and independent variables were significantly related to the dependent variables at a statistically significant level (p<.05). Due to the relatively small sample size, all parametric bivariate tests were repeated using the non-parametric equivalents, which are based upon rank rather than variance, to examine the likelihood that the results of the parametric tests were not based upon errors concerning variance. The results of the bivariate tests were only considered valid if the parametric and non-parametric tests matched in terms of statistically significant findings.

The third phase of data analysis was multivariate analysis. Originally, this phase of data analysis planned to use multivariate models such as multiple linear regression and repeated measures general linear models to model each dependent variable as a function of all explanatory variables significantly related to the dependent variable in bivariate analysis. However, due to the fact that bivariate analyses did not evidence any statistically significant results, the third phase of data analysis was not needed, and the bivariate results were used for final hypothesis testing.

All test assumptions related to parametric testing within this analysis, such as no undue influence of outlier scores and normality, were examined and revealed no significant problems within the final inferential analysis presented. Specifically, regarding the examination of the undue influence of outliers scores, there were two outlier scores within the distribution of pretest self-efficacy
scores that were changed to the next score that was not an outlier to address the undue effects of these outliers. There were no outliers within the distribution of posttest self-efficacy scores.

There were two outliers in the distribution of self-efficacy pretest to posttest change scores that evidenced an undue influence on statistical findings. Specifically, the presence of the outlier scores was driving the significance levels from a significant finding at < .05 to not significant at > .05. The posttest scores of these two cases were altered slightly by reducing one posttest score by .06 and increasing the second by .30 to change these scores to the next score that was not an outlier. The ratio of skewness and kurtosis to the standard error of each, as presented in Table 1, indicated that the distributions of self-efficacy scores were approximately normal.

In terms of psychometric properties, a reliability analysis indicated a sufficient level of internal consistency reliability (Cronbach’s alpha ≥ .70) for the pretest self-efficacy measure (Cronbach’s alpha = .95) and posttest self-efficacy measure (Cronbach’s alpha = .93). In terms of statistical power, the G*power software indicated that an approximately medium effect size (Cohen’s d=.50) would be detected in a Paired Samples t-Test (2-tailed) examining pretest to posttest score change with power set at .80 and alpha set at .05, using a sample size of 34 study participants. A large effect size (Cohen’s d=.80) would be detected in an Independent Samples t-Test (2-tailed) with power set at .80 and alpha set at .05, using a sample size of 52 study participants. A large effect size (f=.45) within a One-Way Analysis of Variance (ANOVA) with three groups would be detected with power set at .80 and alpha set at .05, using a sample size of 51 study participants. Thus, the current sample of 55 study participants provided sufficient statistical power for the current analysis. Seven study participants did not report the gender of the debriefer. Therefore, that analysis was completed with the available data (n=48).

Gender information was collected from question item 2 on the demographic questionnaire. An independent sample t-test was calculated to determine how the debriefing method and participants’ gender affect the difference between pre- and post-self-efficacy. Information on participants’ programmatic levels was collected from question item 5. A one-way Analysis of Variance (ANOVA) was calculated to determine if there is a difference between the debriefing method and programmatic level on pre- and post-self-efficacy. Debriefer gender information was collected from question item 8. An independent sample t-test was calculated to determine how debriefer gender and debriefing method affect the change in pre and post-self-efficacy.

RESULTS

Table 1 presents a descriptive analysis of the categorical variables. Data indicated that the population sample was mostly female (n=42, 76.4%), of a White racial/ethnic identity (n=45, 81.8%), and in the Post Professional Master of Science in Athletic Training Program (MSAT) program level (n=22; 41.8%). All study participants reported having participated in a simulated experience. The most frequent year in the program that the study participants reported participating in standardized patient encounters was MSAT year 1 (n=18, 32.7%). All study participants reported that a debriefing session followed the simulation experience. The most common debriefing method was instructor-led only (n=30, 54.5%). The debriefers’ gender was predominantly male (n=26, 54.2%).

<table>
<thead>
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<th>Variable</th>
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<th>%</th>
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<td>Gender</td>
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<td>Male</td>
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<td>Post Professional Master of Science in Athletic Training Program (MSAT)</td>
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<td>Entry Level Master of Science in Athletic Training Program (EL MSAT)</td>
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<td>Yes</td>
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<tr>
<td>No</td>
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<tr>
<td>Year in the program that the study participant participated in SP encounters (all that apply)</td>
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</table>
The study participant reported the simulation experience was followed by a debriefing session

- Yes: 55 (100.00%)
- No: 0 (0.00%)

**Debriefing method**
- Instructor-led only: 30 (54.5%)
- Video-assisted: 13 (23.6%)
- Peer facilitated: 8 (14.5%)
- Self-debriefing: 4 (7.3%)

**Debriefers’ gender (n=48)**
- Male: 26 (54.2%)
- Female: 22 (45.8%)

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<td>BSAT year 2</td>
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<td>BSAT year 3</td>
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<td>EL MSAT year 5</td>
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Table 2. Descriptive Analysis of Continuous Study Variables (n=55)

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<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>Maximum</th>
<th>Minimum/Skew (SE)</th>
<th>Kurtosis (SE)</th>
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<td>Age</td>
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<td>20.00-32.00</td>
<td>1.52 (.32)</td>
<td>3.18 (.63)</td>
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<td>4.25 (.54)</td>
<td>2.94-5.00</td>
<td>-.90 (.32)</td>
<td>.20 (.63)</td>
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<tr>
<td>Posttest self-efficacy scores</td>
<td>4.48 (.44)</td>
<td>3.41-5.00</td>
<td>-.54 (.32)</td>
<td>-.64 (.63)</td>
</tr>
<tr>
<td>Pretest to posttest self-</td>
<td>.22 (.39)</td>
<td>-.71-1.12</td>
<td>.05 (.32)</td>
<td>.44 (.63)</td>
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<tr>
<td>efficacy change scores</td>
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</tbody>
</table>

Data indicated that pretest self-efficacy scores were not significantly related to the debriefing method, F(3, 51)=3.05, p<.05. Although, at first, data indicated that pretest self-efficacy scores were significantly related to the debriefing method, F(3, 51)=3.05, p<.05, a Bonferroni Post Hoc test indicated that the mean score did not differ at a statistically significant level.
Table 3 presents an Independent-Samples t-Test and One-Way Analysis of Variance (ANOVA) analysis of pretest self-efficacy scores by debriefing method.

### Table 3. Independent Samples T-Test and One-Way ANOVA Analysis of Pretest Self-Efficacy Scores by Debriefing Method (n=55)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M (SD)</th>
<th>t/F (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debriefing method</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor-led only</td>
<td>30</td>
<td>4.33 (.45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video-assisted</td>
<td>13</td>
<td>4.38 (.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer facilitated</td>
<td>8</td>
<td>4.08 (.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-debriefing</td>
<td>4</td>
<td>3.59 (.72)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A Bonferroni Post Hoc test indicated that the mean score between categories did not differ at a statistically significant level.

Table 4 presents an Independent-Samples t-Test and One-Way Analysis of Variance (ANOVA) analysis of pretest to posttest self-efficacy change scores by categorical variables. Data in this table indicated that pretest to posttest self-efficacy change scores were not significantly related to gender, t(53)=.46, p=.64, programmatic level, F(2, 52)=.86, p=.43, debriefers' gender, t(46)=1.59, p=.12, or to the debriefing method, F(3, 51)=.97, p=.41.

### Table 4. Independent Samples T-Test and One-Way ANOVA Analysis of Pretest to Posttest Self-Efficacy Change Scores by Categorical Study Variables (n=55)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M (SD)</th>
<th>t/F (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>.27 (.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>.21 (.43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Science in Athletic Training Program (BSAT)</td>
<td>17</td>
<td>.16 (.40)</td>
<td>.86 (2, 52)</td>
<td>.43</td>
</tr>
<tr>
<td>Post Professional Master of Science in Athletic Training Program (MSAT)</td>
<td>23</td>
<td>.30 (.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry Level Master of Science in Athletic Training Program (EL MSAT)</td>
<td>15</td>
<td>.17 (.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debriefing method</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor-led only</td>
<td>30</td>
<td>.19 (.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video-assisted</td>
<td>13</td>
<td>.15 (.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer facilitated</td>
<td>8</td>
<td>.36 (.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-debriefing</td>
<td>4</td>
<td>.44 (.53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debriefers' gender (n=48)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>.27 (.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>.11 (.36)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The current study did not focus on the pretest to posttest change scores alone. However, Table 5 presents a Paired-samples t-Test examining the changes in pretest self-efficacy scores and posttest self-efficacy scores. Bivariate analysis indicated that self-efficacy scores did increase at a statistically significant level from pretest to posttest, t(54)=4.18, p<.001, with a medium effect size (Cohen's d =.56), but this was not related to the type of debriefing method.
**Table 5. Paired Samples T-Test Analysis of Change in Pretest to Posttest Self-Efficacy Scores (n=55)**

<table>
<thead>
<tr>
<th>Timepoint</th>
<th>n</th>
<th>M (SD)</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>55</td>
<td>4.25 (.54)</td>
<td>4.18 (54)</td>
<td>.0011</td>
</tr>
<tr>
<td>Posttest</td>
<td>55</td>
<td>4.48 (.44)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Cohen’s d = .56 (Medium effect size)

**DISCUSSION**

This study sought to determine if the type of debriefing method following a simulated experience increased athletic training students' self-reported clinical evaluation skill self-efficacy. It also sought to examine if demographics played a role in students' pretest to posttest self-efficacy, including student gender and debriefer gender. The current study also examined the programmatic level and students' age in pretest to posttest self-efficacy. Previous research has indicated that the debriefing component of a simulation exercise is where the learning occurs and that video-assisted debriefing is considered the "gold standard" of debriefing methods compared to other methods like instructor-led, peer-facilitated or self-debriefing.11,15,34,41

This research found no significant relationship between athletic training students' pretest clinical evaluation skill self-efficacy and the type of debriefing method experienced following a simulated experience. No significant association was found between demographic variables of gender, age, and debriefer gender on students' self-efficacy from pretest to posttest. It also found no significant relationship between athletic training students' pretest to posttest clinical evaluation skill self-efficacy and the type of debriefing method. These findings are consistent with the self-efficacy component of Bandura's social cognitive theory in that self-efficacy is often formed before task demands and as a result of self-appraisal of one's ability to perform skills.16 Self-efficacy is one's belief that they are capable of learning or performing skills to attain a specific result, such as clinical evaluation skills.14 Bandura postulates that self-efficacy is derived from past accomplishments, vicarious experiences, verbal persuasion, and emotional arousal rather than from any skill or technique such as a simulated or debriefing experiences.15,16 The results demonstrate that the type of debriefing method following a simulation experience does not increase students' self-efficacy. A specific debriefing method could not be determined as superior to one over another in increasing athletic training students' self-efficacy.

**Limitations**

Limitations of this study included the lack of randomization of participants, sample size, type of sample and the measurement tool. Only current students in athletic training programs were invited to participate in the study. The study's small final sample size was another limitation of this study. The survey was emailed to over 1,000 students but only 55 surveys were usable. Missing information and unfinished surveys contributed to the small sample size. A convenience sample was used to collect the data and delimited to only current athletic training students. The researcher is a member of the National Athletic Trainers Association (NATA) and had access to its Research Survey Service. Student membership to the NATA is not a requirement of students and therefore, additional emails were sent to all program directors to forward to their students. While there are numerous instruments to measure debriefing experiences there are not many tools to measure clinical evaluation skill self-efficacy which can also be seen as a limitation.5,12,57 The Confidence Rating Scale has been shown as a valid tool to measure self-efficacy, and its coefficient alpha value is 0.971.51

Another limitation to this study would be the COVID-19 pandemic. When surveys were being sent, the United States was experiencing a resurgence of COVID-19, this caused academic institutions to shift didactic and clinical schedules and may have been influential in the lack of participation through students not viewing the survey as high a priority as other assignments. This limitation is anecdotal, yet worthy to be mentioned as impacting the participant response. Electronic surveys were begun by 109 students however, only 55 students finished it to completion.

**Implications for Athletic Training Education**

Increasing students' clinical evaluation skills and self-efficacy is essential for athletic training education. Producing competent students who are confident in their clinical skills should be the goal of any health science program. Knowing which debriefing method assists with increasing students' self-efficacy can help programs when developing their simulation exercises and curriculum. Different types of debriefing methods require varied resources for institutions and programs. These resources may include additional staffing, space, time, and possibly expensive audio-visual equipment.25 Knowing which debriefing method is the most effective at helping develop or increase students' self-efficacy will allow programs to implement the appropriate debriefing method for their curriculums. As a result, it may also prevent programs from focusing funding and resources on a less effective method.

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CONCLUSIONs
The current study did not find a statistically significant relationship between debriefing methods and participants' clinical evaluation skill self-efficacy. This result demonstrates that one type of debriefing is not superior to another in increasing clinical evaluation skill self-efficacy in athletic training students. This finding adds to the developing body of research surrounding debriefing methods following simulation. This study does not provide reasons for choosing one debriefing method over another due to the lack of statistically significant findings.

The researchers aimed to investigate how different types of debriefing methods affect athletic training students' clinical evaluation skill self-efficacy. A few recommendations for future work can be derived from this research. The first recommendation is in the design of the study. The researcher used a retrospective quasi-experimental design that relied on participants' memories of their debriefing experiences. Participants may have had to recall events that occurred years or months before this study. It utilized a web-based survey to collect data instead of an experimental design where the data could be collected in real-time. Conducting the research in real time would remove the need for participants to rely on their memories. An experimental design could also study separate groups receiving only one type of debriefing and compare the self-efficacy results of each group.

The researchers used The Confidence Rating Scale to assess self-efficacy in participants before and after a simulation exercise that utilized a debriefing component. This study did not separate the simulation exercise from the debriefing method. In future studies, a researcher can assess self-efficacy with simulation alone and debriefing alone.

Another recommendation for future research is to collect pretest and posttest self-efficacy for the first simulation exercise in athletic training curriculums and then again closer to the end of the program. An important tenet of Badura's social cognitive theory is self-efficacy increases with performance accomplishments. Participants that had multiple simulation experiences may have already had a high level of self-efficacy. This study did find that pretest to posttest changes in self-efficacy did increase at a statistically significant level, t(54)=-4.18, p<.001, with a medium effect size (Cohen's d =.56).

This study did not incorporate any qualitative measures. The addition of a qualitative component to the current findings may provide further insight into students' self-efficacy before the simulation experience with the debriefing method. Further, it may provide a better understanding of whether the simulation experience increased self-efficacy or the debriefing method.

Conducting the study with a larger sample is also a recommendation for future research. Trying to recruit participants by offering incentives can be a potential way to recruit more individuals to complete the survey. Incentives can help encourage students to participate and increase the survey response rate. Monetary incentives such as gift cards could be utilized or non-monetary incentives such as donations to charities.

Current research has shown the benefits of debriefing methods in simulation and the use of one type of debriefing method over another. Yet, other studies have refuted the findings that one method of debriefing is superior to another. These contradictory results continue to drive research in this area. The current study aimed to add to the growing body of literature on self-efficacy and debriefing methods following simulation in athletic training education.
REFERENCES


