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Evaluating the effectiveness of behavioral skills training for teaching CPR and first aid skills to young adults with intellectual disabilities.

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Evaluating the effectiveness of behavioral skills training for teaching CPR and first aid skills to young adults with intellectual disabilities.

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Several researchers have suggested that safety skill instruction has been neglected amongst individuals with intellectual disabilities even though injuries occur at an exceedingly higher rate than the general population. The purpose of the study was to evaluate the effectiveness, generality, and maintenance of the use of behavior skills training to teach 6 CPR and first aid target skills to young adults with intellectual disabilities. Overall, the current study's results suggest that an intervention package using instruction, modeling, rehearsal, and feedback was effective in teaching CPR and first aid skills as well as generalizing across instructors. Additionally, the current study suggests that although behavior skills training was effective at teaching and generalizing mastered target skills, maintenance was not obtainable for all participants across all target skills after a 1-week follow up assessment. Lastly, the intervention package rated high for social validity amongst all participants. Future research should continue to focus on exploring the effectiveness, generality, and maintenance of these results.

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CHAPTER I

INTRODUCTION

Mortality rates for individuals with intellectual disabilities (ID) in the United States are often a result of unintentional injuries (Runyan et al., 2005). Although available injury rate data for individuals with ID remain scarce, these individuals sustain injuries at a relatively higher rate compared to typical developing individuals (Xiang et al., 2015). Due to cognitive limitations, many researchers suggest an individual with ID may be predisposed to sustaining injuries (Argan et al., 2008). Although evidence strongly suggests the need for training individuals with ID who do not have critical safety skills, this is often neglected for this population (Dixon et al., 2010). Skills such as functional communication and daily living skills are typically focused on since they are used on a day-to-day basis. While instances to use safety skills such as knowing what to do in an emergency may occur less often, teaching such critical skills may provide life-saving results when they are needed most (Dixon et al., 2010).

Despite the vast evidence that many individuals with ID do not have the knowledge on how to responds to safety or dangerous situations, little has been done to examine interventions targeting safety skills instruction. Several researchers have suggested that safety skills instruction has been neglected amongst individuals with ID even though injuries occur at an exceedingly higher rate than the general population (Argan, 2004; 2008). Unfortunately, teachers and parents have the perception that individuals ID have been taught safety skills or are incapable to learn a particular safety skill. This systematic perception leaves individuals with ID susceptible to injury, which in turn limits their independence and competence to sustain a life with autonomy

without the help of a caregiver (Argan, 2004). Shi et al. (2015) suggest the need for evidence-based interventions to reduce injury in individuals with ID.

The term "safety skill" refers to a variety of skills needed to maintain physical well-being, including skills such as crossing the road, responding to house fires, and contacting emergency personnel (Collins et al., 1992; Dixon et al., 2010). Basic first aid has long been considered a vital skillset to live independently for individuals with ID (Collins et al., 1992). Knowing how to respond to a first aid emergency, either at home or out in the community, is necessary to produce autonomy (Ozkan, 2013). Collins et al. (1992) national survey data indicated the need for evidence-based safety skills training procedures for individuals with ID based upon parental report but did not specify which interventional procedures would be most effective. It wasn't until a literature review conducted by Dixon et al. (2010) which reviewed journal articles in search of evidence-based interventions for safety skills acquisition that empirical recognition for the use of behavioral skills training (BST) was deemed most effective for teaching safety skill acquisition amongst individuals with ID.

BST is an instructional teaching package consisting of various methods of instruction and modeling. BST when used accurately is an effective technique to teach skills or skill sets. BST as defined by Ward-Horner and Sturmey (2012) is an effective training package that consists of instruction, modeling, rehearsal, and feedback. Components of BST have been used since the 1970s, but the term "behavioral skills training" referring to a treatment package with specific components (i.e., instruction, modeling, rehearsal, feedback) was not used until Sarokoff and Sturmey (2004). Prior to 2004, several researchers have used the components of BST without identifying it as the primary treatment method (Buck, 2014). BST has been used to teach safety

skills related to stranger and abductor safety, firearm safety, fire safety, and first aid safety with both typically developing individuals as well as individuals with ID.

Based on a literature review by Kearney et al. (2018), only seven journal articles have been produced that evaluate the capacity to teach first aid skills to individuals with ID. Various interventional strategies were used amongst the seven researchers. Spooner et al. (1989) were amongst the first researchers to use individual training to teach first aid skills. Marchand-Martella et al. (1991) evaluated the use of interactive storytelling to teach first aid skills. Backwards chaining was used by Gast et al. (1991) to teach first aid skills. Marchand-Martella et al. (1992) used peer teaching and a tutoring format to teach first aid skills. Small group instruction was used by Timko and Sainato (1999), and peer and self-video modeling was used by Ergenekon (2012) and Ozkan (2013) to teach first aid skills. Kearney et al. (2018) used a peer-mediated literacy-based behavioral intervention to teach first aid skills.

Although the previous studies (e.g., Ergenekon, 2012; Gast et al., 1992; Kearney et al., 2018; Marchand-Martella et al., 1992; Ozkan, 2012; Spooner et al., 1989; Timko & Sainato, 1999) produced successful results, there is limited research in the use of evidence-based interventions concluding that other interventional strategies need to be conducted to investigate different type of intervention packages that can be used to teach first aid skills. Additionally, out of the seven studies, adults were not used in their participant populations. Across the seven studies, only first aid skills were taught; the need for training in other areas of safety need to be conducted, such as teaching how conduct Cardiopulmonary resuscitation (CPR) and use an automated external defibrillator (AED).

The majority of the relevant literature (e.g., Ergenekon, 2012; Gast et al., 1992; Kearney et al., 2018; Marchand-Martella et al., 1992; Ozkan, 2012; Spooner et al., 1989; Timko &

Sainato, 1999) has explored the use of various instructional teaching methods to increase First Aid skills with children with ID. As a result, there is limited research exploring the effectiveness of BST related to CPR and First Aid amongst adult populations with ID. Researchers suggest future investigations using BST to expand the use of BST across different populations and skill sets (Morgan & Wine, 2018).

Purpose of Study

As a result, the purpose of the study was to determine whether BST was an effective intervention for teaching six CPR and First Aid target skills (i.e., concussion, CPR/AED, dislocation, fainting, first aid review, and seizure). All Components of BST (instruction, modeling, rehearsal, feedback) were included in this study to determine the effectiveness of the treatment package on six target skills. Previous research studies (Gast et al., 1992; Marchand-Martella et al., 1992; Spooner et al., 1989) used simulated injuries while conducting baseline, BST, post-training, generalization, and maintenance procedures. Similar simulated scenarios in the current study were used in addition to full size body manikins and CPR certified manikins for each task analysis. Additionally, Johnson et al. (2005) determined that in-situ training in the post-training phase was effective for meeting post-training criteria for participants who could not reach mastery following mastery in BST. In-situ training was added to the post-training component following mastery of the BST training for all participants. The researcher also explored generalization procedures, specifically, whether BST was effective in generalizing the CPR or First Aid skill across people. Lastly, the researcher explored maintenance procedures, specifically, whether BST was effective in maintaining the CPR or First Aid skill target skills during a one-week follow-up maintenance session.

Findings from this study not only add to the current first aid literature by expanding knowledge of the effectiveness of the use of BST to teach CPR and first aid skills, but also extend intervention procedures to a new population, adults with ID. Lastly, results from this study add to the BST literature by expanding knowledge of the effectiveness of the use of BST to teach complex CPR and First Aid skills. With the addition of CPR in the first aid literature, this study expanded the capacity to extend safety skills outside of teaching basic first aid skills.

Research Questions

This study seeks to answer the following questions.

Research Question 1: Is Behavior Skills Training an effective intervention to teach CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) for young adults with intellectual disabilities?

Research Question 2: Can Behavior Skills Training be used to effectively maintain CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) for young adults with intellectual disabilities?

Research Question 3: Can Behavior Skills Training be used to effectively generalize CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) across clinicians for young adults with intellectual disabilities?

CHAPTER II

LITERATURE REVIEW

BST largely incorporates aspects of behaviorism and social learning theory through the practice of applied behavior analysis using single case design to analyze data prior to intervention implementation and throughout intervention phases. BST is implemented using instruction, modeling, rehearsal, and feedback (Karokoff & Sturmey, 2004; Ward-Horner & Sturmey, 2012). Regarding behaviorism, BST uses positive reinforcement (praise) throughout rehearsal and feedback phases when the individual receiving the intervention is correctly performing the task (Skinner, 1953). Positive corrective feedback is included in the feedback component of BST which includes reviewing what the participant did correctly, what the participant did incorrectly, and how to improve the participant's performance. Additionally feedback should be presented in a positive fashion using reinforcement to ensure the constructive criticism remains positive throughout the rehearsal and feedback phases (Miltenberger, 2000).

Additionally, BST incorporates Bandura's Social Learning Theory (Latham & Saari, 1979) through observations of others in a social setting when implementing the instruction and modeling components. During instruction, the instructor will thoroughly provide the steps to take to reach the desired outcome with the participant prior to implementing the modeling component of BST. During the modeling phase, the instructor will perform the desired task to be learned in front of the participant using a tasks analysis to break the steps of the desired task into multiple behaviors that comprise the desired outcome (Miltenberger, 2000). Through observation, the participant is expected to be able to perform some of the task during the rehearsal phase prior to

receiving feedback, thus indicating that modeling alone may provide evidence of social learning theory through observing the instructor modeling the desired outcome behavior (Miltenberger, 2000).

BST falls within the applied behavior analysis (ABA) group of interventions based upon a host of implementation features including the use of positive reinforcement and the method as to which performance is observed and measured (Buck, 2014). The use of positive reinforcement is evident in many components of BST including the rehearsal and feedback portion of the treatment package. One of the hallmark features of BST that roots itself in ABA is the method as to which performance is observed and measured throughout the rehearsal phase. ABA measures performance based upon measurable behavior as to what can be observed. The desired behaviors are well defined prior to the implementation of the treatment package and can only be recorded through direct observation of behavioral tasks. The use of measuring behavior observationally is evident in the rehearsal portion of BST where the participant must perform multiple tasks to reach a specific outcome goal. Performance is measured through observing the task behaviors and determining if the behavioral tasks are completed correctly based upon observable behavior. BST does not determine any measurable outcomes on behaviors or other intrinsic thoughts that cannot be observed to determine correct performance (Miltenberger, 1999).

When observing the type of data analysis used in the literature for examining the effects of BST on a specific behavior, task, or skill, frequently single case design is used. Specifically, multiple baseline/probe design. Often, BST is implemented using a small sample of participants in which a particular skill is taught in sequence using either three behaviors, participants, or locations. Using multiple baseline design when implementing BST allows the researcher to stagger the interventions. Typically, when implementing BST, participants are assigned to at

least three experimental conditions with different start points depending on the length of the baseline phase for each condition (Ferron et al., 2014). By staggering the start points for each condition, the researchers can separate treatment effects from each other which provides control between the conditions to evaluate the effectiveness of the intervention (Hinderer et al., 1990).

Procedural Components and Historical Relevance of BST

Instruction

The first component of BST includes the presentation of either written and/or verbal instruction of the desired task as to which the participant will be expected to learn (Jahr, 1998; Mokma, 2018). Instruction is often formalized using a task analysis which breaks down the desired task into sequential steps. Instruction has also been implemented with visual displays, signs, or signals (Mokma, 2018). When providing instruction, the tasks should be written with specificity pertaining to the description of what the desired task consists of, because this is the first time the participant will be exposed to what is expected of them to learn (Breeden, 2011). Instruction should be constructed using the exact chain of behaviors that will be expected of the participant to perform and be written in an easily understood format including operational definitions of each behavior included in the instructions (Miltenberger, 2008; Mokma, 2018). A component analysis by Yeaton and Bailey (1983) analyzed the effectiveness of the components of their training model: 1) tell them, 2) show them, 3) ask them, 4) let them, and 5) feedback. Yeaton and Bailey (1983) concluded that using the instruction portion alone (tell them and show them) does not produce significant performance. Alavosius and Sulzer-Azaroff (1990) reported that instruction alone is not sufficient to produce significant results in performance and implied further components needed to be added to instruction to ensure proper treatment is applied.

Modeling

The second component of BST follows the instruction component which involves the instructor demonstrating the exact steps to take to complete the desired task (Breeden, 2011; Mokma, 2018). The primary purpose or justification for the use of modeling is that the participant can directly observe the correct sequence of behaviors to be taken to reach the desirable outcome in preparation for the third component of BST, rehearsal (Breeden, 2011, Miltenberger, 2008). Wurtele et al. (1987) stated that modeling can be implemented in two forms referred to as live or symbolic modeling. When the instructor directly models the desired behavior within the appropriate environment for the behavior to take place, it is considered live modeling. If the use of videotape, audiotape, or another form of media presentation is utilized to provide modeling, it is considered symbolic modeling (Breeden, 2011; Wurtele et al., 1987). The methods of live and symbolic modeling can also be termed as in situ, role-play, or simulated (Wurtele et al, 1987).

Rehearsal

The third component of BST, following the instruction and modeling components, provides an opportunity for the participant to rehearse the desired behavior or skills previously modeled by the instructor (Breeden, 2011; Mokma, 2018). Additionally, corrective feedback is a crucial component used during rehearsal, because it allows the trainer to provide positive reinforcement for correctly performed steps, and error correction for steps taken incorrectly (Breeden, 2011; Miltenberger, 2008). Applying a rehearsal component has led to higher performance proficiency when applied to behavioral techniques and training programs (Smith et al., & Ivar, 1992). Wurtele et al. (1987) also found that when using a rehearsal component, greater acquisition of a desired behavior or skills has been reported which decrease the number

of exposures to the training procedures. Mokma (2018) regarded the rehearsal component as the most important yet most challenging portion of BST; and due to the difficulty of implementing this component, it is often left out or neglected. Allowing the participant to directly engage in the desired behavior has resulted in higher performance rates, as opposed to simply discussing the tasks or behaviors expected to be performed with the participant (Mokma, 2018).

Feedback

The last component of BST includes providing reinforcement through positive praise and positive corrective feedback. Feedback is often provided within the rehearsal component when necessary to ensure that the steps being taken to complete a task are taken independently in correct sequence when referencing the instruction and modeling components (Breeden, 2011; Mokma, 2018). Positive praise is often used to provide feedback when steps of a task are being correctly taken to complete the overall outcome skill, and positive corrective feedback is often necessary when the participant incorrectly performs a step within the task analysis. Corrective feedback can include recycling back to previous components including instruction, modeling, and rehearsal (Mokma, 2018). Ivancic et al. (1981) emphasized the importance of strictly providing performance-based corrective feedback and positive feedback when implementing the feedback component of BST. Alavosuis and Sulzer-Asaroff (1990) found that when feedback was provided during BST, efficiency rates were much higher, thus indicating that feedback is a crucial component to speed up skill acquisition. Providing feedback during the rehearsal phase has also been emphasized to ensure that performance skills are being maintained and generalized outside of the training environment (Breeden, 2011; Harchik et al., 1992; Mokma, 2018).

Maintenance and In-situ/Generalization

An additional component of BST, which is not required when using traditional BST, started to arise in more recent literature to evaluate the effectiveness of the treatment package outside of the treatment environment (Mokma, 2018). Maintenance and in situ/generalization often occurs following mastery in the rehearsal and feedback components. Maintenance and in situ/generalization components are typically a brief follow-up procedure that only includes one observation of the desired outcome performed by the participant. During the maintenance component the participant is brought back to the treatment environment post-training and asked to perform the task (Himle et al., 2004; Miltenberger et al., 1999; 2005) Regarding in-situ, the participants are placed into a naturalistic environment without knowledge of being examined where a situation will be simulated requiring the use of the skill mastered during training (Himle et al., 2004). Generalization can be used in-situ and by substituting the instructor to assess if generalization effects are carried over when asked to perform the task by a novel instructor (Miltenberger et al., 1999). Miltenberger (2008) stressed the importance of accurately implementing in-situ training within a naturalistic environment using multiple personnel. Miltenberger (2008) also noted that if the trainee was not able to perform the task in the training environment, then additional training should be provided in the natural environment using in-situ procedures.

Relevant BST Safety Skills Research

The first evidence of the use of BST components occurred when Danish and Hauer (1973) conducted a study to teach skills required to implement specific techniques. The term Danish and Hauer used in their study to describe their method was “skills training groups”. The outlined components used by Danish and Hauer included identifying behavior objectives,

practicing skills, group discussion, understanding the reason for using the skills, presenting the skills, actively participating in the skills by the trainees, modeling of techniques, and immediate feedback. Although eight steps were provided using Danish and Hauer's model, there are several components that reflect the components included in BST (Danish & Hauer, 1973; Buck, 2014).

In 1981, Gordan and Davidson created a training package comprised of three goals including training parents to focus on observable and measurable behavior, teaching parents concepts such as reinforcement and punishment learning theory, and helping parents apply the concepts with their children (Buck, 2014; Gordan & Davidson, 1981; Haffey & Levant, 1984). Gordan and Davidson used the term "behavior skills training" for this training procedure. This was the first time in literature referring to a training package as behavior skills training (Buck, 2014; Gordan & Davidson, 1981). Although Gordan and Davidson used the term "behavior skills training" this does not refer to the current definition nor procedures of BST used today within the literature (Buck, 2014). Although many researchers have used components of behavioral skills training independently in its early years of development; it has been found that when used in sequential order including all components (i.e. instruction, modeling, rehearsal, and feedback), BST provides the most efficient results (Mokma, 2018).

BST has been used to teach children and adolescents with and without disabilities a wide variety of safety skills. Of the skills taught throughout the relevant literature, researchers primarily focused on *strangers and abductors aversion* (Gundy & Rapp, 2014; Johnson et al., 2005; Marchand-Martella et al., 1996; Poche et al., 1981), *firearm safety* (Gatheridge et al., 2004; Hanratty et al., 2016; Himle et al., 2004; Kelsok et al., 2007; Miltenberger, 2008; Vanselow, & Hanley, 2014) , and *fire safety* (Garcia et al., 2016; Houvouras, 2014). There is limited research pertaining to teaching respondent skills to medical scenarios. Of the literature

found only six articles have been published pertaining to first aid responding using behavior skills training. (Ergenekon, 2012; Gast et al., 1991; Kearney et al., 2018; Marchand-Martella et al., 1991; 1992; Ozkan, 2013; Spooner et al., 1989; Timko & Sainato, 1999).

Stranger and Abductor Safety

There have been several studies using components of BST to teach children stranger and abductor safety skills. Poche et al. (1981) was amongst the first to evaluate the effectiveness of BST to teach abduction-prevention skills to three typically developing preschool age children using a multiple baseline design across three types of abduction lures. Poche et al. (1981) developed a training protocol using adults that resemble the typical child molesters arrested in the local area and created three different types of luring scenarios including simple lures, authority lures, and incentive lures. All trainings took place 50 feet from the school on sidewalks. Using instruction, modeling, rehearsal, and feedback, Poche et al. (1981) aimed to teach the children to use the verbal phrase "No, I have to go ask my teacher," and run towards the school. Following BST, all participants showed significant improvement in handling all three type of abduction lures, both in the training environment and in a generalized naturalistic environment. Poche et al. (1981) assessed for maintenance following 12-weeks post-training and found only one of the participants was able to maintain appropriate responses to abduction lures.

Similarly, Marchand-Martella et al. (1996) replicated Poche et al.'s (1981) study using two 4-year-old children. Marchand et al. (1996) extended upon Poche et al. (1981) by examining long term maintenance effects following the implementation of BST as well as extending the response the children were to use which now included, "no", run away, and tell a teacher when exposed to simple, authority, and incentive abduction lures. Similar to Poche et al. (1981), Marchand et al. (1996) found BST was effective at teaching luring avoidance skills but failed to

provide criterion-based results when assessed at seven and again at sixty-four-weeks post-training (Marchand et al., 1996).

Due to the failed attempt to maintain abductor avoidance skills over time, Johnson et al. (2005) extended upon Poche et al. (1981) and Marchand-Martella et al. (1996) by evaluating the effectiveness of adding an in-situ component if participants failed the follow-up assessment after meeting criteria during BST training. In-situ training was assessed during baseline, training; and 2-weeks, 1-month, and 3-month follow ups post-training. Johnson et al. (2005) used the same abductor lures included in Poche et al. (1981) and Marchand-Martella et al. (1996) with 13 preschool age children using a multiple baseline design. Results showed that all participants were able to meet criteria during BST training, 2-week follow up, and 1-month follow-up when in situ assessment was included throughout the implementation of BST training. All participants but 3 maintained criteria when assessed in-situ during the 3-month follow up (Johnson et al., 2005).

Gunby et al. (2010) extended upon Johnson et al. (2005) by assessing the effectiveness of BST to teach abductor avoidance skills to three children diagnosed with autism spectrum disorder (ASD) ranging from ages 6 to 8. Gunby et al. (2010) also extended from Collins et al. (1993) conclusion that children with developmental disabilities are unable to maintain acquired safety skills in environments that were not included within the training. The use of BST and in-situ training was used to teach similar responses to three children with ASD how to respond to abduction lures using a multiple baseline design. In addition to the three abduction lures used in Poche et al. (1981), Marchand-Matella et al. (1996), and Johnson et al. (2005), Gundy et al. (2010) added an additional lure component defined as assistance request. Results concluded that all three children were able to meet criteria during training and maintained criteria follow up in one month. Gundy et al. (2010) concluded that children with autism and developmental

disabilities can affectively be taught safety skills using BST, and the safety skills taught can be maintained using in-situ training within the training procedure (Gunby et al., 2010).

Gunby and Rapp (2014) extended upon their previous study (Gunby et al., 2010) which used BST and in-situ training to examine the training and maintenance performance of responding to abductors using verbal responses. Gunby and Rapp (2014) added a high probability sequence component throughout the training portion of BST to generalize the realistic methods as to which offenders get children to comply with their lures (Elliott, Brown, & Kilcoyne, 1995). Gunby and Rapp (2014) had three participants between the ages of 5 and 6 years old. Results indicated that when using BST with high probability demands along with in-situ assessment, all three participants achieved criteria for training, and maintained criteria after a one-month follow-up.

Reflecting on this lineage of this research, it is evident that BST is effective at teaching abductor avoidance skills yet lacks the evidence of the use of BST on different populations based on disability criteria and age. Extending the lineage of this research line to different population will benefit the generalizability of the treatment package.

Firearm Safety

There have been several studies that use components of BST to evaluate the effectiveness of teaching firearm safety. Himle et al. (2004) conducted a study in retrospect to their previous study Himle and Miltenberger (2004) in which they evaluated the use of the National Rifle Association Eddie Eagle gun safety program to teach firearm safety to children. The Eddie Eagle program was successful at teaching firearm safety skills to children, but children were unable to perform the firearm safety skills when generalized into a naturalistic setting. Additionally, the participants who received the program training performed just as well as the control group

(Himle & Miltenberger 2004). Himle et al. (2004) had eight children between the ages of 4-to-5 years old participate in BST training with supplemental in-situ training to evaluate the effectiveness of the treatment program aimed to teach participants how to respond if a firearm is found (i.e., don't touch, leave the area, tell an adult). Himle et al. (2004) used a multiple baseline design to evaluate the treatment progression and generalization effects. Results concluded in 3 of the 8 children meeting criteria while receiving BST training. Five of the participants required in-situ training to meet criteria. All participants met criteria when assessed in a naturalistic environment and during a 2-to 8-week follow-up assessment.

Following significant results using BST to teach firearm safety (Himle et al., 2004), Gatheridge and colleagues (2004) used a posttest method of comparison to evaluate the difference in skill acquisition between two treatment groups with 42 children aged between 6 and 7 years of age. (Eddie Eagle Gunsafe Program and BST) and one control group (no treatment). In-situ assessments were used to evaluate the effectiveness of each program. Gatheridge et al. (2004) discovered both treatment programs to be equally effective for teaching firearm safety skills but found that the children placed in the Eddie Eagles Gunsafe Program had to receive more in-situ training when compared to the BST treatment group. Both treatment groups performed significantly higher than the control group (Gatheridge et al., 2004). Kelsok et al. (2007) performed a direct replication of Gatheridge et al. (2004) study with 30 children between the ages of 8 and 9 years old. Kelsok et al. (2007) found similar results as to which both treatment groups were successful at teaching firearm safety, but the BST treatment group performed significantly higher when compared to the control group. Kelsok et al. (2007) also noted both treatment groups had participants in in-situ training for variable amounts of trials, which was different when compared to Gatheridge et al. (2004) study.

Hanratty et al. (2014) sought to extend upon Himle et al. (2004) study by training a teacher to implement BST in a classroom setting instead of being implemented by a researcher within a controlled environment. Hanratty et al. (2014) justified the use of a teacher through the research conducted by (Gross, 2007; Jostad, 2008) who both noted that BST and in-situ training can be time intensive and has previously required trainers and graduate students to implement the training procedures. Hanratty directed replicated Himle et al.'s (2004) study with five preschool students. Upon results, it was concluded that BST alone did not produce significant results, and all participants had to be placed in in-situ training. Following in-situ training four out of the five participants met criteria; there were some limitations that may explain the ineffectiveness of the treatment program. The first of which is the teacher only provided correct corrective feedback 71% of the time across all participants. The teacher also used punishment for one of the children when compliance was not being met. Due to these limitations, more adequate training for the teacher was recommended prior to treatment implementation (Hanratty et al., 2014).

One of the major limitations from this line of research is that the demographic populations used only pertained to typically developing participants. Further exploration into various populations including individuals with disabilities should be conducted using BST.

Fire Safety

Recently, there has been two studies evaluating the effectiveness of BST for teaching fire safety skills. Houvouras and Harvey (2014) took procedures from previous studies proven to be effective in teaching gun safety (Gatheridge et al., 2004; Himle & Miltenberger, 2004; Himle et al., 2004; Miltenberger et al, 2005) and abductor avoidance skills using BST and in-situ training. (Johnson et al., 2005; Poche et al., 1981). Using three participants 10-years of age and a concurrent multiple baseline design, Houvouras and Harvey (2014) evaluated the effectiveness

of BST and in-situ training on teaching how to 1) avoid the deactivated lighter 2) leave the area 3) report the lighter to an adult. Upon findings, all three participants met criteria during training and were able to maintain acquired skills during a 1-month follow-up assessment. Garcia et al. (2016) extended upon Houvouras and Harvey's (2014) methodology using 3 children between the ages of 3 and 5 years old with a diagnosis of ASD to flee from a fire risk setting and notify adults contingent on hearing a fire alarm. Results concluded all participants met criteria during training, generalization, and a 5-week follow-up. Garcia et al. (2016) noted the use of verbal praise was receptive for all participants. BST has shown to be effective for children and adolescents with and without disabilities, yet limited research has been conducted to evaluate the effectiveness with other populations. Further implementation of BST concerning fire skills needs to be evaluated.

First Aid Safety

There have been several studies that use components of BST to evaluate the effectiveness of teaching first aid skills. The first of which was conducted by Spooner et al. (1989) who used simulated injuries posed by adults to teach first aid acquisition with four adolescents with developmental disabilities. Participants ranged in ages between 16 and 17 years of age. A multiple baseline design was used to evaluate the effects of BST on performance criteria. The primary first aid skill for acquisition the researchers aimed to target required the participants to elicit adult assistance in response to a presented injury. A generalization component was implemented to assess if the skills could be applied outside of the treatment setting. Results concluded that all participants met criteria during training, maintained skills after 1-month post training assessment, and generalized skills to their residences and on the school playground (Spooner et al., 1989).

In 1992, Gast et al. evaluated the use of simulated injuries and backward chaining to teach three first aid skills (i.e. minor cuts, burns, and insect bites) to four students with moderate developmental disabilities. Extending Spooner et al. (1989) study, Gast et al. (1992) included the addition of task analysis and backwards chaining to the instructional procedures. Gast et al. (1992) used small group sessions as opposed to Spooner et al. (1989) who individually provided training. A multiple probe design was used to evaluate the effectiveness of BST using task analyses and backwards chaining on the acquisition of three first aid skills. Upon findings Gast et al. (1992) concluded that all participants met criteria during training and generalization but found mixed results when maintenance was assessed. Gast et al. (1992) results were drastically different when assessing maintenance. Authors discussed that allowing participants with disabilities more opportunities to practice mastered first aid skills and assessing for specific errors as to why participants may have decreased in steps correct during maintenance probing. Additionally, researchers suggested teaching participants how to discriminate when to respond to different first aid safety responses during training when multiple skills are being taught in a training program (Gast et al., 1992).

Following Gast et al. (1992), Marchand-Martella et al. (1992) conducted a study evaluating the effectiveness of a peer-modeled program for four students with moderate intellectual disabilities extending the literature to determine if a peer-model would be effective at teaching first aid skills through a BST training package. Participants ages ranged from ages 7 to 11 years. Three simulated injuries were used (i.e. abrasions, burns, and cuts) to teach first aid response skills. A multiple probe design across participants was used to examine the effects of the intervention package. Marchand-Martella (1992) concluded that not only did the peer-

modeled first aid program work for meeting criteria during the training condition, but skill acquisition was also observed to meet criteria in generalization (Marchand-Martella, 1992).

Timko and Sainato (1999) extended upon the literature of Gast et al. (1992) by examining the effects of group instructed BST to teach first aid skills for home related injuries through simulated injuries for 9 children aged 41 to 69 months of age. Following Gast et al. (1992), Timko and Sainato (1999) used the same first aid skill descriptions and method of visual analysis to examine the effects of group instruction BST training, generalization, and maintenance. Timko and Sainato (1999) probed maintenance and generalization probes continuously following post-training assessment for at least five sessions in each assessment probe type. All maintenance and generalization probes remained at mastery criteria. Similar to Gast et al. (1992), Timko and Sainato (1999) found that group instructed BST treatment package was effective for all participants to whom met mastery criteria during post-training, generalization, and maintenance.

After years of dormancy of literature pertaining to using variations of BST to assess the impact on first aid skill acquisition, Ergenekon (2012) conducted a study evaluating the incorporation of video modeling in the modeling component of BST to teach how to react to home-accidents (i.e., cuts, abrasions, and minor burns) first aid skills to children (aged between 7 and 9 years old) with ASD. A multiple probe design was used to evaluate the effectiveness of video modeling BST for skill acquisition. Upon results, Ergenekon (2012) found that incorporating video modeling into BST was effective and all participants met criteria during training, generalization, and maintenance. Different from all relevant research, Ergenekon (2012) used reinforcement for correct implementation of responses to safety scenarios. Reinforcement was thinned from a fixed-ratio of 3 correct responses to a fixed-ratio of 13 responses in maintenance sessions.

Ozkan (2012) expanded on Ergenekon (2012) study by comparing the use of peer and self-video modeling using an alternating treatment design to evaluate the effectiveness of skills acquisition in training, generalization, and maintenance. Ozkan (2012) included three participants with intellectual disabilities between the age of 9 and 14 years old. The primary skills targeted included addressing burns and bleeding wounds. Ozkan (2012) concluded that both the peer modeling and self-video modeling variations produced equal effectiveness for skill acquisition, generalization, and maintenance. Similar to Ergenekon (2012), Ozkan (2012) used reinforcement throughout training and removed it during maintenance probes. Only two maintenance probes were included in this study at one and two weeks post-intervention. Ozkan (2012) concluded that replication of the study needed to be produced with more participants and include different first aid skills.

In 2018, Kearney et al. (2018) expanded upon Ozkan (2012) by combining peer-mediated modeling with literacy-based behavioral interventions (LBBI). Kearney et al. (2018) also expanded on the use of LBBIs that was found to be effective in teaching self-care skills to adolescents with ASD (Bucholz & Brady, 2008). Using a combination of peer and LBBI modeling, Kearney et al. (2018) had three participants with ASD (two of which had a comorbid disorder of ID) aged between 15 and 17 years of age in the study using a multiple baseline design. Upon results, Kearney et al. (2018) concluded that all participants met criteria during training following the modeling component using peer mediated LBBIs. Following training, all participants remained at criteria during two follow-up assessments following 10 to 21 days post training (Kearney et al., 2018). Unlike previous studies noted in the other areas of relevant research, all first aid safety skills training using BST was conducted using individuals with disabilities. It is interesting to note that all studies did not include an in-situ component to their

research. This may be explained by the difficulty to simulate an in-situ first aid situation in a naturalistic environment without the participant knowing. Further research needs to be evaluated using a more diverse group of participants in age and disability categories.

Summary

While there is a vast amount of research supporting the use of BST as an effective intervention for appropriately teaching safety skills, there is no existing research exploring the use of BST among emerging adults, specifically within the first aid literature using BST. Additionally, most of the existing first aid literature has explored the effectiveness of the intervention with children. However, no studies exist using a population with intellectual and developmental disabilities specifically with adults. Furthermore, there is a gap in the first aid literature that combines first aid with CPR, AED, and first aid skill development. Within the current study, there are six tasks analyses as to which the participants are going to be taught CPR, AED, and first aid skills using BST. Each of the task analyses coincide with the correct procedures in sequence as to which an individual would be receiving traditional CPR, AED, and first aid certification training. The BST training and post training assessments will be conducted using a timeline of two days, which is common amongst most CPR and first aid certification programs.

The goals of the current study were to determine if BST is an effective training method to teach CPR, AED, and first aid skills to young adults with intellectual and developmental disabilities. Additionally, the current study aims to determine if once CPR, AED, and first aid skills are acquired, can they be generalized outside of the treatment setting using a novel clinician who will conduct the scenario procedures. Another goal for the current study is to determine if learned skills can be maintained over time following completion of the training

procedures. Lastly, the current study seeks to determine if the participants found the training procedures to be effective.

Research Questions

This study seeks to answer the following questions.

Research Question 1: Is Behavior Skills Training an effective intervention to teach CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) for young adults with intellectual disabilities?

Research Question 2: Can Behavior Skills Training be used to effectively maintain CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) for young adults with intellectual disabilities?

Research Question 3: Can Behavior Skills Training be used to effectively generalize CPR and first aid skills (i.e., concussion, fainting, dislocation, CPR/AED, first aid review, seizures) across clinicians for young adults with intellectual disabilities?

CHAPTER III

METHODOLOGY

The current study examined the effects of BST procedures to teach six CPR and first aid respondent skills to three participants with intellectual disabilities. A combination of tasks analyses, CPR and first aid training equipment (e.g., CPR manikin, first aid kits, training AED kit) were used for both training and evaluation purposes. A multiple probe design across behaviors was used, and visual analysis was the primary data analysis procedure.

Recruitment, Participants, and Setting

The participants in the current study were recruited from a university-based post-secondary education program for young adults with intellectual disabilities in the southeastern United States. Recruitment consisted of posting flyers in the post-secondary education program's main building. Following recruitment, parent permission forms, participant consent forms, and demographic questionnaires were obtained from each participant and caregiver. Three participants were included in this study to participate individually in the intervention procedures. Participant 1, Amy was a 25-year-old African American female with diagnoses of intellectual disability and autism spectrum disorder. Amy reported she was not familiar with the terms CPR and First Aid, nor had she participated in CPR and First Aid training courses. Participant 2, Raj was a 23-year-old African American male with diagnoses of intellectual disability and 10q Deletion Syndrome. Raj reported he was familiar with the terms CPR and First Aid but had

never participated in CPR and First Aid training courses. Participant 3, Howard was a 23-year-old Caucasian male with a diagnosis of intellectual disability. Howard reported he was familiar with the terms CPR and First Aid but had never participated in CPR and First aid training courses. The study was conducted by six doctoral level graduate students in a school psychology program located in the southeastern United States. Intervention sessions took place in a large treatment room at a university-based school psychology services clinic located in the southeastern United States. Prior to data collection, the Office of Research Compliance was contacted in order to obtain approval from the Institutional Review Board (IRB) for Protection of Human Subjects in Research (Appendix A).

Inclusionary Criteria

Several factors were considered to participate in this study. First, participants had to be between the ages of 18:0 and 25:11 years old and have a reported intellectual disability from a third-party source (i.e., previous therapist, psychologist, psychiatrist, special education record, etc.). Participants must also have never participated a CPR/First Aid course prior to participation in this study. All participants were able to speak and understand English and attend to the instruction and corrective feedback provided throughout the study. The screening protocol for participants can be found in Appendix B1.

Materials

Demographic Questionnaire

In order to gain a better understanding of the participant's personal information and experiences with CPR/First Aid, a demographic questionnaire was administered. The questionnaire was designed to collect information pertaining to the participant's age, race,

gender, history of CPR and First aid, and ability to perform basic CPR/First Aid tasks. The demographic questionnaire can be found in Appendix B2.

Task Analyses

Throughout this study, six task analyses were developed for each of the conditions pertaining CPR/First Aid training. Task analyses were provided to the participants in form of a printed document, as well as to be used for data collection by the primary and secondary researchers. The document for the task analysis was constructed using Microsoft Word. Treatment integrity forms were constructed through use of Microsoft Word and printed out in the form of a paper copy. There are two variations of each task analyses. One of which is the researcher copy, and the other being the participant copy. The difference between the two forms includes spaces by each step of the task analyses in the researcher copy to record percent correct. These spaces are absent in the student copy. Task analyses for each condition can be found in Appendix C1-C12.

CPR and First Aid Medical Dummy

Two variations of manikins were used for the study, which were determined by the specific condition the participants was undergoing. For all conditions excluding the CPR and AED conditions, full body manikins were used to implement procedures. During CPR and AED condition, a specific CPR and AED certified manikin was used. Per individual condition the same manikin was used during baseline, BST, post-training, maintenance, and generalization phases.

CPR and First Aid Materials

A variety of CPR and First Aid equipment was used during this study. Materials were used during all treatment phases including baseline, BST, post-training, generalization, and maintenance. Materials used in the study included three First Aid kits, rubber gloves, CPR mouth covers, and a training AED kit. Materials used in the first aid kits included tape and bandage wrap.

History Training

A history training using a PowerPoint presentation was used to provide an overview of each condition in the study (e.g., concussion, fainting, seizure, dislocation, CPR and AED, and First Aid review), as well as, reviewed common CPR and First Aid knowledge and terminology (e.g., CPR chest compression to breathe ratio, AED procedures, ABC [airways, breathing, circulation]).

Data Collection

For this study, data on the percentage of correct steps per session were collected using the tasks analysis sheet per session, condition, and phase. Percentage of steps completed correctly ranged from 0% to 100%. For this study, all baseline, BST, post-training, and generalization sessions occurred in one day. Follow-up maintenance sessions were conducted one-week following completion of the generalization sessions. The reasoning for conducting all baseline, BST, post-training, and generalization sessions in a single day was to emulate a similar time of completion as it would take to complete a traditional CPR and First Aid certified course.

Training, Interobserver Agreement, and Treatment Integrity

The primary researcher collected data during each session; simultaneously, a secondary graduate researcher also collected data for 100% of sessions. Five researchers were trained on the implementation and data collection procedures for this study. For training purposes, the primary researcher reviewed the purposes of the study and protocols for each phase with the secondary researchers. According to Kratochwill et al. (2010), minimum acceptable values for IOA range from 80% to 90%. Treatment integrity forms for each condition can be found in Appendix D1-D5.

In this study, IOA and TI was collected for 100% of the sessions for each phase in order to meet the suggested criteria (Kratochwill et al., 2010). Trained secondary researchers were used to collect IOA during attended sessions in person and independently collect data on each of the participant's answers and which steps were completed and not completed by the primary researcher. IOA was calculated by dividing agreed upon instances between observers on the recordings of number of steps completed by agreement plus disagreements multiplied by 100. TI was calculated by dividing the number of steps completed correctly by the total number of possible steps. Task analyses researcher forms used for taking IOA can be found in Appendix C1-C6.

Research Design

A multiple probe design (MPD) across behaviors was used to compare the effectiveness of behavioral skills training to teach six different CPR/First Aid skills (i.e. concussion, CPR+AED, dislocation, fainting, First Aid, and seizure). MPD are typically used to evaluate treatments designed to improve multiple desirable skills or skills acquisition (Leford & Gast,

2018). A MPD is a variation of multiple baseline design that allows the researcher to analyze the effectiveness of an intervention through recurrent presentation of probes (Leford & Gast, 2018). MPD are used when interventions have non-reversible, trial-based procedures, and are used when sets of behaviors are assessed rather than a single behavior (Leford & Gast, 2018).

In order to meet research standards criteria, this study followed the procedural guidelines presented by Leford and Gast (2018) when using MPD. The first guideline is identifying and defining a minimum of three similar yet functionally independent behaviors (six tasks analysis behaviors) or sets of behaviors, emitted by one individual. The second guideline includes having a sensitive, reliable, valid, and feasible data collection system and pilot the system and your behaviors definitions. This can be explained in the current study by the use of tasks analysis data collection sheets and treatment integrity sheets for each trial throughout the study. The third guideline includes, prior to the start of the study, having an established criterion for introduction of the interventions. For this study, all participants must reach 100% of trials for 3 consecutive trials on an intervention before another intervention is presented (Leford & Gast, 2018).

The fourth guidelines states that prior to study implementation, the researcher must identify the methods as to which interventions will be assigned to tiers. For this study, intervention conditions were randomly assigned to tiers. The fifth guideline states that treatment fidelity and reliability must be determined prior to study implementation for a minimum of 33% of trials across all intervention condition (Leford & Gast, 2018). For this study, treatment reliability was conducted for 100% of trials using the researcher task analysis for each intervention condition, and treatment integrity forms were used 100% of each intervention using treatment integrity forms for each intervention (Leford & Gast, 2018).

Guidelines six and seven include using concurrent baseline probes for all tiers and the use of continuing baseline while other interventions are in place. Guideline eight states that once data in tier one have met criteria, discontinue data collection and begin the second probe condition. For this study this was used when moving from baseline, BST, post-training, generalization, and maintenance for one intervention condition. The ninth guidelines states that when data in all tiers are stable in the probe condition, begin intervention for behaviors assigned to the second tier. The last guideline inquires repeating steps eight and nine until all data have been collected for the current study (Leford & Gast, 2018).

Independent Variable

The independent variable in this study included the implementation of BST across six CPR and First Aid respondent conditions. BST was implemented using instruction, modeling, rehearsal, and feedback. The first step of BST was provided orally and in form of a task analysis. A total of six-task analyses were used in this study, which coincided with each condition. The next step of BST is modeling. Modeling was implemented by the primary researcher through oral instruction as well as performing the steps correctly outlined on the task analyses with the subject manikins and all pertinent medical materials. Following modeling, the participants rehearsed the steps for each condition respondent scenario using a visual aid of the task analysis and verbal feedback until mastery criteria was met (e.g., three consecutive trials of 100% completed steps, at least five data points).

Dependent Variable

The dependent variable was percentage of step completed correctly for each six tasks analyses assessing various CPR and first aid related respondent scenarios. Six CPR/First Aid

scenario skills were selected based off the American Red Cross CPR and First Aid Training Program. A task analysis was created for each skill and each step was objectively defined. Input from the university's gymnasium coordinator of recreation facilities was used to develop each task analysis. When observing the number of steps per task analysis, the concussion task analysis includes fifteen steps in order to complete the procedural task. Amongst the remaining task analyses the CPR and AED task analysis includes eight steps; the dislocation task analysis includes eleven steps; fainting task analysis includes nine steps; first aid task analysis includes twelve steps; and the seizure task analysis includes steps to complete the procedural task. Correctly performed steps observed were reported as percentage of correct steps.

All participants' start points for each intervention were determined based upon their individual progress throughout the phases. During baseline, all participants were administered at least five probes (Kratochwill et al., 2010). Once the first intervention phase begins, the remaining five intervention conditions randomly assigned baseline probes until intervention was implemented. Randomized assignment of tiers was used to randomize the six task analyses for each participant in the order of intervention condition assignment implementation (Leford & Gast, 2018). Prior to implementing intervention for each condition, at least five baseline probes were administered directly before implementation (Kratochwill et al., 2010).

Data Analysis

Data analyses included visual analysis of data patterns to identify changes in level, trend, variability, overlap, immediacy of change, and consistency of patterns, and vertical analysis across similar phases. The use of visual analysis of data aided researchers in determining whether evidence of relation between the independent variable and the outcome exist, as well as

determine the strength and magnitude of the relationship (Kratochwill et al., 2010). In addition to the use of visual analysis, a calculation of non-overlap of all pairs (NAP) was conducted, as outlined by Parker and Vannest (2009) to additionally measure the effect size. NAP is an effective method for calculating effect sizes as compared to other common procedures, according to Parker and Vannest (2009). NAP determines the amount of overlap between baseline, control, or withdrawal conditions to treatment conditions. The procedure compares each individual datum point in one condition (e.g., baseline) to each datum point in the subsequent condition (e.g., post-training, Maintenance, and Generalization). Therefore, NAP scores were calculated between baseline and the post-training phase, baseline and the generalization phase, and baseline and the maintenance phase. NAP scores between 0-.065 are considered weak, 0.66-.92 are moderate, and 0.93-1.00 are large (Parker & Vannest, 2009).

Procedures

Baseline

During each baseline session, no written instruction detailing each step in the task analysis were provided prior to, or during the session. Each baseline session began when the observer asked the participants to respond to one of the six scenarios. All materials needed for each condition were provided in front of the participant during this phase. The session was terminated if one of three conditions occurred: the participant stated that he/she was done, the participant stated he/she did not know what to do, or when 30-seconds passed without activity. No feedback was provided during baseline. Pertaining to data collection, at the start of the study, all participants received three initial baseline probes. During baseline, each condition was required to have three initial baseline probes and three baseline probes immediately prior to

going into behavior skills training. Baseline probes in-between the initial and pre-interventions probes must not be more than seven probes apart.

History Training

Following the initial three baseline points for all conditions, a brief history training was provided to the participants. The training was conducted using a PowerPoint presentation which provided an overview of each condition in the study (e.g., concussion, fainting, seizure, dislocation, CPR and AED, and First Aid review), as well as, reviewed common CPR and First Aid knowledge and terminology (e.g., CPR chest compression to breathe ratio, AED procedures, ABC [airways, breathing, circulation]). The training was held in a similar treatment room where the intervention was conducted. History training outline can be found in Appendix F.

Behavioral Skills Training

Following baseline and history training, BST was used as the intervention component to the study. BST consisted of oral and written instruction, modeling, rehearsal, and feedback. Oral instruction consisted of the observer reading the steps from one of the six condition tasks analysis while modeling the steps for each scenario. Written instruction consisted of a student copy of the tasks analysis for which to reference during the training. Modeling consisted of the researcher acting out procedures to take to complete the tasks analysis correctly. The participant was instructed to rehearse the steps, and feedback was provided as the participant recalled the steps in the scenario. Specific praise was provided throughout the session when steps were completed correctly. Any questions about the task analysis were answered. Instruction, modeling, rehearsal, and feedback were repeated until the participant completed three consecutive sessions with 100% of the steps correctly for at least five sessions. The participant

discontinued BST if he/she did not meet mastery criteria within 15-trials. Training data are not represented but are available from the corresponding author.

Post-Training

Following completion of BST, the participant was instructed to complete the condition without the task analyses provided to them. Each post-training session began when the observer asked the participants to complete one of the six conditions. The session was terminated if one of three conditions occurred: the participant stated that he/she was done, the participant stated he/she did not know what to do, or when 30 seconds passed without activity. If the participant missed a step in the task analysis, he/she was immediately stopped and corrected prior to the completion of the task. The observer would then complete the task analysis from the point at which the participant made an error. The observer would then record how many steps the participant completed correctly before a step was taken incorrectly and modeling and feedback was provided. The participant moved onto the next phase once he/she has completed the task analyses correctly for three consecutive sessions at 100% accuracy with at least five sessions per phase. The participant discontinued post-training if he/she did not meet mastery criteria within 15 trials.

Generalization Probe

Immediately following mastery in the post-training phase, one session was conducted with a trained secondary researcher that he/she has not worked with for the CPR/First Aid procedures. The generalization condition was implemented similarly to the post-training sessions. Each generalization session began when the observer asked the participants to respond to one of the six scenarios. The session was terminated if one of three conditions occurred: the

participant stated that he/she was done, the participant stated he/she did not know what to do, or when 30-seconds passed without activity. No feedback was provided during this phase.

Maintenance Probe

The maintenance probe was completed one week after generalization data collection was complete. The maintenance probe was implemented identically to baseline sessions. Each maintenance session began when the observer asked the participants to respond to one of the six scenarios. The session was terminated if one of three conditions occurred: the participant stated that he/she was done, the participant stated he/she did not know what to do, or when 30 seconds passed without activity. No feedback was provided during maintenance and only one session was conducted per condition.

Social Validity Assessment

A modified version of the Children's Intervention Rating Profile (Witt & Elliott, 1985) was given to all participants following maintenance sessions. The items were rated on a 7-point Likert scale (e.g., 1-Strongly Disagree, 7-Strongly Agree). To assure all participants understand the language on the assessment, modifications to the CIRP were made to assure that all participants understand the items. The purpose of this assessment was to determine if the participants perceived the intervention to be successful in teaching CRP/First Aid skills. Total scores are obtained by summing all items. Individual items were also examined. Internal consistency of this particular instrument ranges between .75 to .89. The social validity scale can be found in Appendix E.

CHAPTER IV

RESULTS

The current study sought to determine if the use of BST to teach six CPR and first aid target skills (i.e., concussion, CPR/AED, first aid review, fainting, dislocation, and seizure) was effective, generalizable, and maintainable for three young adults (Amy, Raj, and Howard) with ID. Due to the parameters of data collection, treatment package, and single case design used; data across all participants were presented and graphed independently of each other.

Figure 1 shows percentage of steps correctly identified across baseline, post-training, generalization, and maintenance for participant 1 (Amy). Figure 2 shows Amy's acquisition of skills per target skill. Figure 3 shows percentage of steps correctly identified across baseline, post-training, generalization, and maintenance for participant 2 (Raj). Figure 3 shows Raj's acquisition of skills per target skill. Figure 4 shows percentage of steps correctly identified across baseline, post-training, generalization, and maintenance for participant 3 (Howard). Figure 5 shows Howard's acquisition of skills per target skill. Visual analysis of level, trend, variability, overlap, immediacy of change, vertical analysis, and consistency of patterns across similar phases was the primary method for interpretation of results (Kratochwill et al., 2010).

Effect size was calculated using non-overlapping pairs (NAP) between baseline and other phases. Effect size tables can be found in Table 1 and Table 2. Additionally, Table 3 shows social validity scores for all participants based on a modified version of the Children's

Intervention Rating Scale. The purpose of this assessment was to determine if the participants perceived the intervention to be successful in teaching CRP/First Aid skills.

Participant 1: (Amy)

Baseline

Amy initially was provided baseline probes for three consecutive sessions for all target skills. Three consecutive baseline probes were also provided immediately before a target skill was moved into treatment. Additionally, baseline probes were administered intermittently between the initial and pre-treatment consecutive sessions for every three to seven sessions. Throughout all baseline probes per target skill, Amy scored 0% with no increase in level and trend and no variability. The consistency of the pattern of baseline data points was similar in all target skill conditions with all remaining at 0% steps correct. Visual display of baseline sessions for participant one can be found in Figure 1.

Behavior Skills Training

Amy moved into BST for targeted skills in a staggered and randomized order so that no more than one target skill would be in BST at a time. All other target skills remained in baseline. BST sessions did not require baseline probing of other target skills while conducting training sessions. Following BST Amy met mastery criteria for all target skills including first aid review (six sessions), fainting (5 sessions), concussion (eight sessions), seizure (nine sessions), dislocation (five sessions), and CPR and AED (five sessions). During BST sessions targeting first aid review skills Amy had an upward trend in correct responses which remained at 100% and remained steady at mastery criteria. For the target skill fainting, Amy started at a high level with an immediate upward trend to mastery criteria with no variability. For concussion and

seizure targeted skills Amy started at a high level with slight variability until reaching mastery criteria. Dislocation sessions started with a high level with a brief downward trend, which quickly rose in level to mastery criteria. Lastly, during the CPR and AED BST sessions, Amy started out with a high level with a quick upward trend to mastery criteria with no variability. Visual display of behavior skills training sessions for participant one can be found in Figure 2.

Post-training

Amy moved into post-training sessions following meeting mastery criteria per targeted skill. When Amy made an incorrect step in the sequence of steps needed to complete each target skill, the therapist stepped in and completed the remainder of the steps. Amy met mastery criteria for all target skills including first aid review (five sessions), fainting (five sessions), concussion (five sessions), seizure (five sessions), dislocation (five sessions), and CPR and AED (five sessions). For all target skills, Amy started at a high level and remained at 100% for all sessions with no variability until meeting mastery criteria. When comparing baseline to post-training sessions within one targeted skill there was a distinct immediacy of change following the implementation of BST. When evaluating vertical analysis for all six targeted skills all targeted skills that remained in baseline while targeted skills in post-training remained at 0% while post-training sessions showed an immediate change in level in correct steps. Visual display of post-training sessions for participant one can be found in Figure 1.

Generalization

Amy was provided a generalization probe following meeting mastery criteria for each targeted skill in post-training. Generalization was evaluated across people where a trained novel therapist would instruct Amy to respond to each targeted skill. Amy scored at 100% for all target

skills including first aid review, fainting, concussion, seizure, dislocation, and CPR and AED. Visual display for the generalization probe can be found in Figure 1.

Maintenance Probe

Approximately one week following generalization probes for all target skills Amy was provided one maintenance probe for each targeted skill. Maintenance probes were conducted identically to baseline sessions. Amy scored at 33% for first aid review, 11% for fainting, 40% for concussion, 8% for seizure, 36% for dislocation, and 37% for CPR and AED. During all maintenance probes there was an immediate drop in level compared to post-training and generalization sessions for all targeted skills. Visual display for the maintenance probe can be found in Figure 1.

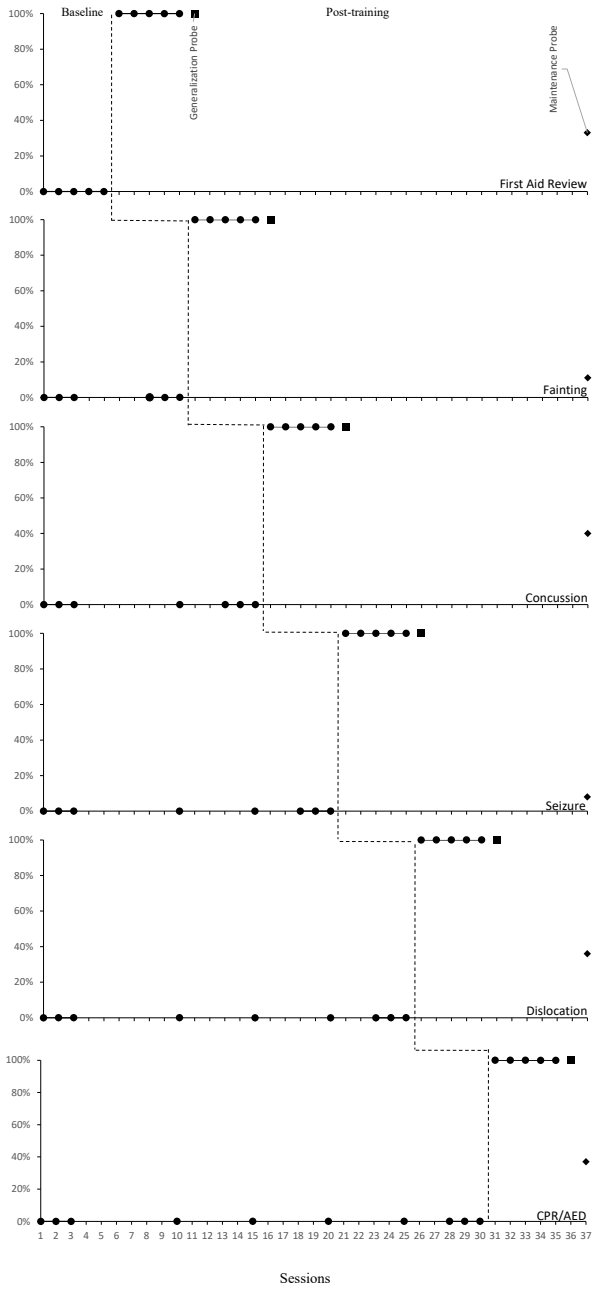

Figure 1. *Participant 1 Baseline, Post-training, Generalization, and Maintenance*

Note. Percentage of correct steps across targeted skills and phases. The above figure displays the percent of steps correct across targeted skills including first aid review, fainting, concussion, seizure, dislocation, and CPR/AED. Phases include baseline and post-training.

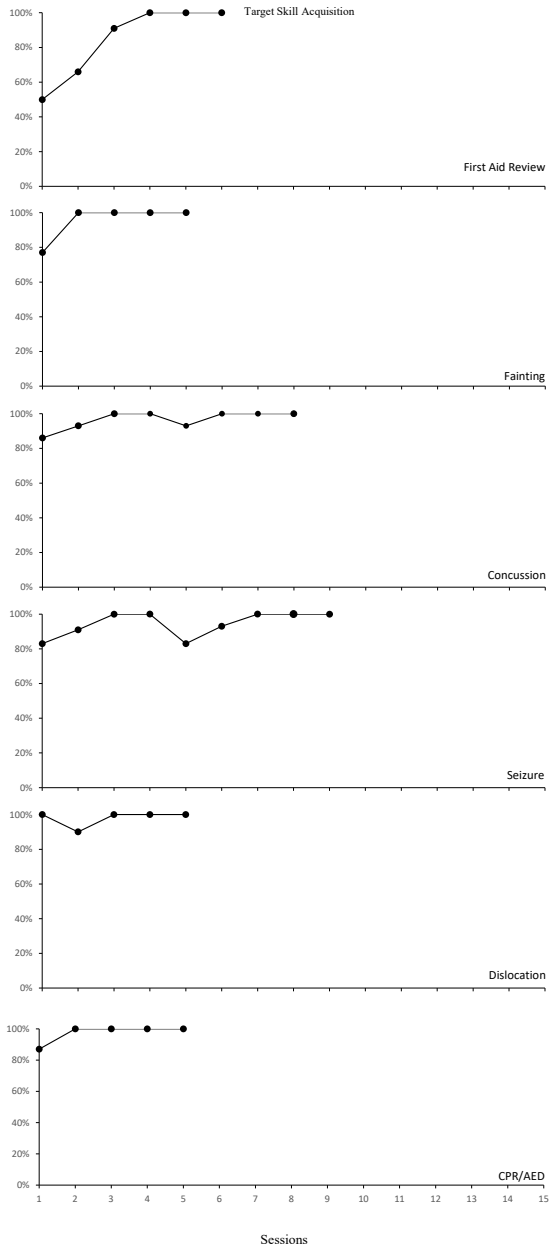

Figure 2. Participant 1 Behavior Skills Training Across Target Skills

Note. Percentage of correct steps across targeted skills during BST. The above figure displays the percent of steps correct across targeted skills including first aid review, fainting, concussion, seizure, dislocation, and CPR/AED.

Participant 2 (Raj)

Baseline

Raj initially was provided baseline probes for three consecutive sessions for all target skills. Three consecutive baseline probes were also provided immediately before a target skill was moved into treatment. Additionally, baseline probes were administered intermittently between the initial and pre-treatment consecutive sessions for every three to seven sessions. Throughout all baseline probes for most target skills Raj scored 0% with no increase in level and trend and no variability across target skills. During CPR and AED probes, Raj scored 12.5% on the second probe, but quickly decreased to 0% for the remainder of baseline probes. The consistency of the pattern of baseline data points was similar in all target skill conditions with all remaining at low or 0% steps correct. Visual display for baseline sessions can be found in Figure 3.

Behavior Skills Training

Raj moved into BST for targeted skills in a staggered and randomized order so that no more than one target skill would be in BST at a time. All other target skills remained in baseline. BST sessions did not require baseline probing of other target skills while conducting training sessions. Following BST Raj met mastery criteria for all target skills including CPR and AED (seven sessions), seizures (6 session), first aid review (6 sessions), dislocation (5 sessions), fainting (five sessions), and concussion (nine sessions). During BST sessions, targeting CPR and AEDs Raj had a steady upward trend with no variability in correct responses leading to mastery criteria. For the target skill seizure, Raj started at a high level with a steady upward trend to mastery criteria. In first aid review, Raj started at a moderate level, which steadily increased in

level until reaching mastery criteria. For dislocation and fainting targeted skills Raj started at a moderate level, which rose steadily to mastery criteria. Concussion sessions started with a low to moderate level with a brief downward trend, which steadily rose in level to mastery criteria. Visual display for behavior skills training sessions can be found in Figure 4.

Post-training

Raj moved into post-training sessions following meeting mastery criteria per targeted skill. When Raj made an incorrect step in the sequence of steps needed to complete each target skill, the therapist stepped in and completed the remainder of the steps. Raj met mastery criteria for all target skills including CPR and AED (five sessions), seizure (five sessions), first aid review (five sessions), dislocation (five sessions), fainting (five sessions), and concussion (five sessions). For most target skills, Raj started at a high level and remained at 100% for all sessions with no variability until meeting mastery criteria. In the CPR and AED, post-training sessions Raj had a slight decrease in the third session but quickly increased in level to 100% steps correct until reaching mastery criteria. When comparing baseline to post-training sessions within one targeted skill there was a distinct immediacy of change following the implementation of BST. When evaluating vertical analysis for all six targeted skills all targeted skills that remained in baseline while targeted skills in post-training remained at 0% while post-training sessions showed an immediate change in level in correct steps. Visual display for post-training sessions can be found in Figure 3.

Generalization Probe

Raj was provided a generalization probe following meeting mastery criteria for each targeted skill in post-training. Generalization was evaluated across people where a trained novel

therapist would instruct Raj to respond to each targeted skill. Raj scored at 100% for most target skills including first aid review, fainting, concussion, seizure, and CPR and AED, and 91% for dislocation. Visual display for the generalization session can be found in Figure 3.

Maintenance Probe

Approximately one week following generalization probes for all target skills Raj was provided one maintenance probe for each targeted skill. Maintenance probes were conducted identically to baseline sessions. Raj scored at 25% for CPR and AED, 8% for seizure, 25% for first aid review, 18% for dislocation, 22% for fainting, and 6% for concussion. During all maintenance probes, there was an immediate drop in level compared to post-training and generalization sessions for all targeted skills. Visual display for maintenance sessions can be found in Figure 3.

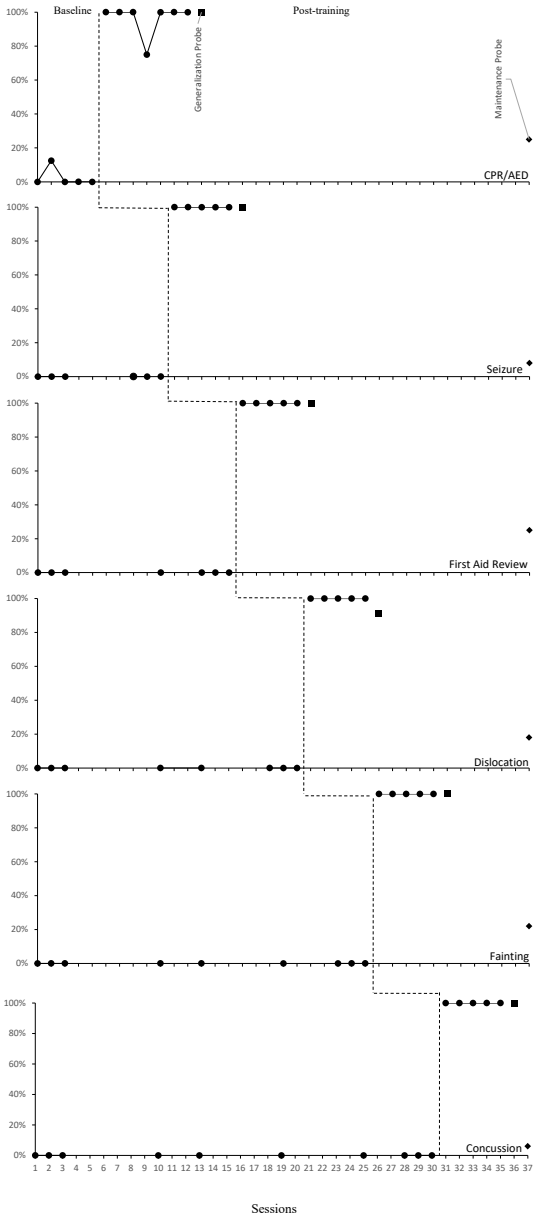

Figure 3. Participant 2 Baseline, Post-training, Generalization, and Maintenance

Note. Percentage of correct steps across targeted skills and phases. The above figure displays the percent of steps correct across targeted skills including CPR and AED, seizure, first aid review, dislocation, fainting, and concussion. Phases include baseline and post-training.

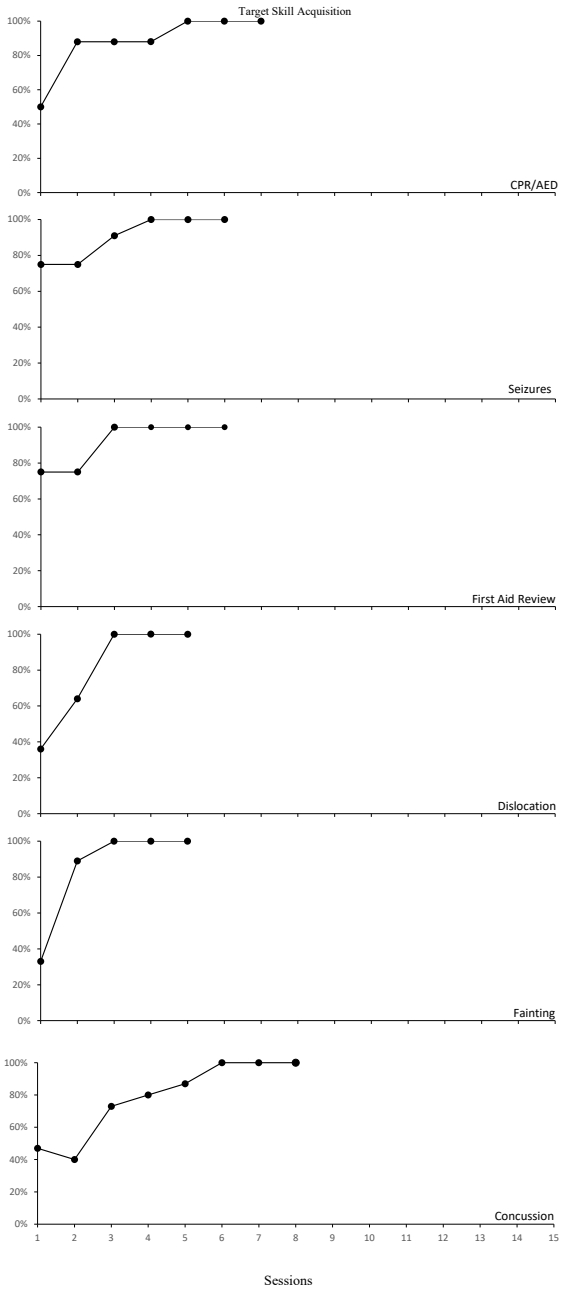

Figure 4. Participant 2 Behavior Skills Training Across Target Skills

Note. Percentage of correct steps across targeted skills during BST. The above figure displays the percent of steps correct across targeted skills including CPR and AED, seizure, first aid review, dislocation, fainting, and concussion.

Participant 3 (Howard)

Baseline

Howard initially was provided baseline probes for three consecutive sessions for all target skills. Three consecutive baseline probes were also provided immediately before a target skill was moved into treatment. Additionally, baseline probes were administered intermittently between the initial and pre-treatment consecutive sessions for every three to seven sessions. Throughout all baseline probes for most target skills Howard scored 0% with no increase in level and trend and no variability across target skills. Only in first aid review, Howard scored 8.5% on the fourth probe but quickly decreased to 0% for the remainder of baseline probes. The consistency of the pattern of baseline data points was similar in all target skill conditions with all remaining at low or 0% steps correct. Visual display for baseline sessions can be found in Figure 5.

Behavior Skills Training

Howard moved into BST for targeted skills in a staggered and randomized order so that no more than one target skill would be in BST at a time. All other target skills remained in baseline. BST sessions did not require baseline probing of other target skills while conducting training sessions. Following BST Howard met mastery criteria for all target skills including concussion (11 sessions), first aid review (seven sessions), CPR and AED (six sessions), seizures (six sessions), dislocation (six sessions), and fainting (five sessions). During BST sessions targeting concussion Howard had a steady upward trend with no variability in correct responses with a steady decrease in trend at session six, which then returned to an upward trend leading to mastery criteria. For the target skill first aid review, Howard started at a high level with a steady

upward trend to mastery criteria. For CPR and AED, Howard started at a high level, which rose steadily to mastery criteria. In seizure sessions, Howard started at a high level with a slight decrease in trend at the second session, which then steadily increased in level until reaching mastery criteria. Concussion sessions started low to moderate in level with an increase in trend, which steadily rose in level to mastery criteria. Fainting sessions started with a high level and quickly increased to meet mastery criteria. Visual display for behavior skills training sessions can be found in Figure 6.

Post-training

Howard moved into post-training sessions following meeting mastery criteria per targeted skill. When Howard made an incorrect step in the sequence of steps needed to complete each target skill the therapist stepped in and completed the remainder of the steps. Howard met mastery criteria for all target skills including concussion (five sessions), first aid review (five sessions), CPR and AED (five sessions), seizures (five sessions), dislocation (five sessions), and fainting (five sessions). For all target skills, Howard started at a high level and remained at 100% for all sessions with no variability until meeting mastery criteria. When comparing baseline to post-training sessions within one targeted skill there was a distinct immediacy of change following the implementation of BST. When evaluating vertical analysis for all six targeted skills remaining in baseline maintained at 0% while post-training sessions showed an immediate change in level in correct steps. Visual display for post-training sessions can be found in Figure 5.

Generalization Probe

Howard was provided a generalization probe following meeting mastery criteria for each targeted skill in post-training. Generalization was evaluated across people where a trained novel therapist would instruct Howard to respond to each targeted skill. Howard scored at 100% for all target skills including concussion, first aid review, CPR and AED, seizures, dislocation, and fainting. Visual display of the generalization session can be found in Figure 5.

Maintenance Probe

Approximately one week following generalization probes for all target skills Howard was provided one maintenance probe for each targeted skill. Maintenance probes were conducted identically to baseline sessions. Howard scored at 7% for concussion, 83% for first aid review, 25% for CPR and AED, 8% for seizures, 18% for dislocation, and 22% for fainting. During all maintenance probes, there was an immediate drop in level compared to post-training and generalization sessions for all targeted skills. Visual display of the maintenance session can be found in Figure 5.

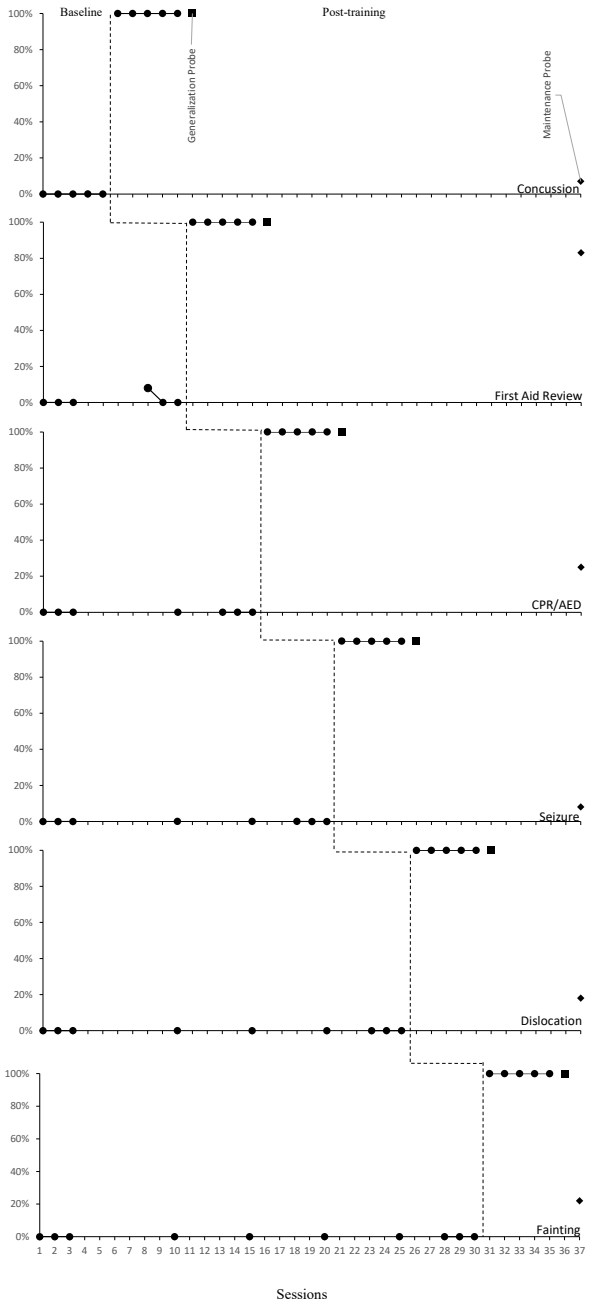

Figure 5. Participant 3 Baseline, Post-training, Generalization, and Maintenance

Note. Percentage of correct steps across targeted skills and phases. The above figure displays the percent of steps correct across targeted skills including concussion, first aid review, CPR and AED, seizure, dislocation, and fainting. Phases include baseline and post-training.

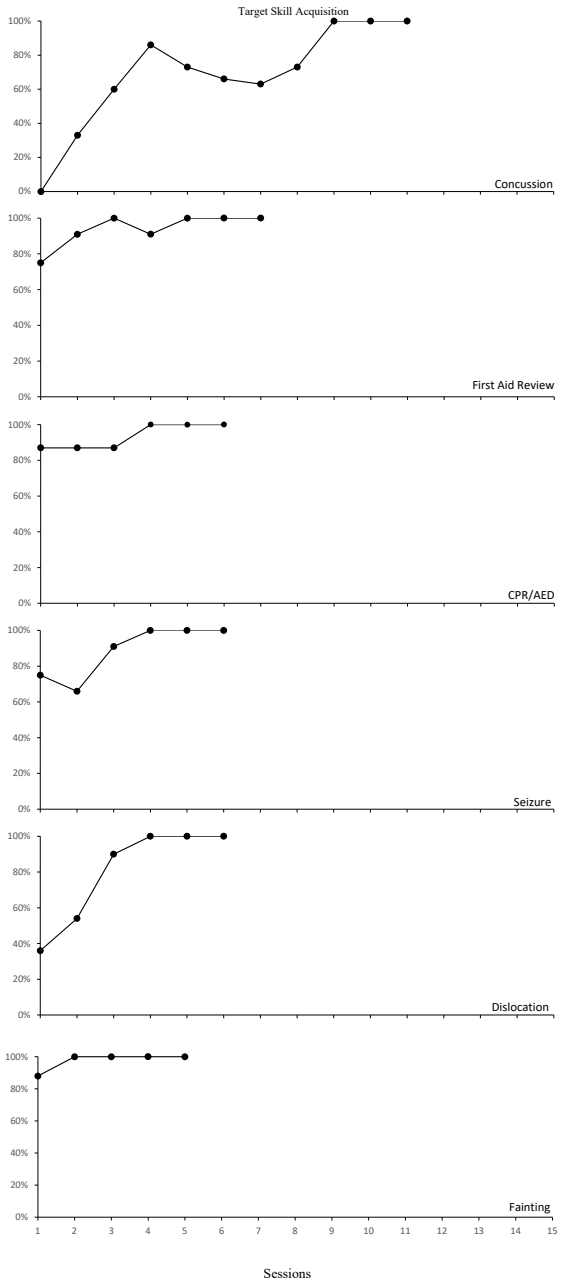

Figure 6. Participant 3 Behavior Skills Training Across Target Skills

Note. Percentage of correct steps across targeted skills during BST. The above figure displays the percent of steps correct across targeted skills including concussion, first aid review, CPR and AED, seizure, dislocation, and fainting.

Interobserver Agreement and Treatment Integrity

A secondary therapist who was present throughout the entirety of the study collected IOA for 100% of sessions for all three participants. IOA was calculated using both the primary and secondary therapist's copy of their task analyses for each session and phase of the study including baseline and post-training. For Amy IOA scores in all conditions were 100% in baseline, 97.19% (range 87.5% to 100%) in BST, and 100% in post-training with an overall mean score of 99.59%. For Raj IOA scores in all conditions were 100% in baseline, 97.19% (range 87.5% to 100%) in BST, and 100% in post-training with an overall mean score of 99.59%. Lastly, for Howard IOA scores in all conditions were 100% for baseline, BST, and post-training.

Treatment integrity was collected by both the primary and secondary therapist for all three participants for 100% of all sessions and phases. Therapist used the treatment integrity sheet which was separated by phases and specific probing procedures. Phases included baseline and post-training. Specific probes included generalization and maintenance probes. The mean treatment integrity score for all participants and training phases and specific probing procedures was 100%.

Non-overlapping Pairs (NAP)

Supplementing visual analysis, effect size was calculated to evaluate overlap between phases as compared to baseline. Participant's effect sizes can be found in Table 1 and Table 2. NAP effect sizes for concussion, dislocation, and fainting can be found in Table 1. Effect sizes for CPR/AED, seizure, and first aid review can be found in Table 2. NAP scores were calculated between baseline and post-training, baseline and generalization, and baseline and maintenance

per target skills will all participants. All effect sizes excluding one (baseline to BST at .95), Howard) were found to be 1.00, indicating a large effect size. This suggest that all participants had no overlap, and therefore, large effect size from baseline to post-training and baseline to generalization. Although effect size was 1.00 for maintenance across all participants and target skills, it is not an adequate representation of effect size between baseline and maintenance.

Table 1

Results of Non-overlapping Pairs (NAP) for Target Skills (Concussion, Dislocation, Fainting)

Concussion	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	0.95*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Dislocation	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	1.00*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Table 1 (continued)

Fainting	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	1.00*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Note. The above table represents NAP effect size for Amy, Raj, and Howard between baseline and behavior skills training, baseline and post-training, baseline and generalization, and baseline and maintenance for the following target skills: concussion, dislocation, and fainting. The * denotes large effect size.

Table 2

Results of Non-overlapping Pairs (NAP) for target skills (CPR/AED, Seizure, First Aid Review)

CPR/AED	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	1.00*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Seizure	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	1.00*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Table 2. (continued)

First Aid Review	Amy	Raj	Howard
Baseline to Behavior Skills Training	1.00*	1.00*	1.00*
Baseline to Post-training	1.00*	1.00*	1.00*
Baseline to Generalization	1.00*	1.00*	1.00*
Baseline to Maintenance	1.00*	1.00*	1.00*

Note. The above table represents NAP effect size for Amy, Raj, and Howard between baseline and behavior skills training, baseline and post-training, baseline and generalization, and baseline and maintenance for the following target skills: CPR/AED, seizure, and first aid review. The * denotes large effect size.

Social Validity Scale

The Modified Children's Intervention Rating Scale was administered to all three participants following completion of the study (Witt & Elliott, 1985). Social validity scores are shown in Table 3. The items were rated on a 7-point Likert scale (e.g., 1-Strongly Disagree, 7-Strongly Agree). All participants rated the instructions as neutrally to strongly easy to follow. Amy and Raj additionally rated the teaching method used by the instructor would be a good one to use with other people, their likeness of the training, and benefits of the training to make them a better adult as high, indicating that BST overall was a socially valid intervention to teach CPR and first aid skills. Although all participants had high regard for the interventions used in this study, Howard strongly disagreed that the teaching method used by the instructors would be a

good one to use with other people. He additionally, rated the method used to teach me CPR and first aid skills may cause problems with my friends. Overall, social validity ratings suggest that this study was socially valid, but there were some considerations pertaining to the methods used pertaining to difficulties of training their peers and suggestion of the training to others with one participant. Visual display of participant 1, 2, and 3's social validity scores can be found in Table 3.

Table 3

Results of Modified Children's Intervention Rating Scale

Questions	Amy (Participant 1)	Raj (Participant 2)	Howard (Participant 3)
It was easy to follow the directions. .	4	4	6
The instructor was too harsh on me.	1	1	1
The method used to teach me CPR and First Aid skills may cause problems with my friends.	1	2	7
There are better ways to teach CPR and First Aid skills besides the training I had.	1	1	1
The teaching method used by the instructor would be a good one to use with other people.	7	7	1
I liked the training used for learning CPR and First Aid skills.	7	7	7
I think that the training I was provided for CPR and First Aid would help me be a better adult.	7	7	7

Note. The above table represents social validity scores for Amy, Raj, and Howard using the Modified Children's Intervention Rating Scale. Items were scored using a 7-point Likert scale (e.g., 1-Strongly Disagree, 7-Strongly Agree).

CHAPTER V

DISCUSSION

The purpose of the current study was to evaluate the effectiveness, generality, and maintenance of BST to teach CPR and first aid skills to three young adults with ID. The current study sought to do so by using an evidence-based skill acquisition procedure known as behavior skills training. The components used in behavior skills training for this study included instruction, modeling, rehearsal, and feedback. Behavior skills training has been empirically proven effective in teaching a variety of safety skills including first aid skills (e.g., Ergenekon, 2012; Gast et al., 1992; Kearney et al., 2018; Marchand-Martella et al., 1992; Ozkan, 2012; Spooner et al., 1989; Timko & Sainato, 1999). In addition to evaluating effectiveness, generality, and maintenance, this study sought to extend upon the current literature in behavior skills training for teaching more complex first aid skills compared to its predecessors by using task analyses, which emulate the American Heart Association's CPR and first aid training courses. Lastly, this study evaluated social validity of the study with all three participants using the Modified Children's Intervention Rating Scale.

Teaching CPR and First Aid Skills

Of the empirical questions presented in this study, the first sought to evaluate the effectiveness of BST in teaching six CPR and first aid target skills pertaining to responding to fainting, concussion, CPR/AED, seizure, first aid review, and dislocation. Effectiveness was evaluated by visual analysis of level, trend, variability, consistency of patterns, vertical analysis,

and immediacy of change. Additionally, effectiveness was measured using NAP to calculate the effect size between baseline and other phases (i.e., post-training) and specific probes (i.e., generalization, maintenance) for each participant in each target skills.

Overall, all participants acquired all target skills which was defined as completing three consecutive sessions at 100% correct steps with at least five sessions in BST. Immediately following BST for a target skill, each participant was moved into post-training assessment sessions in which all participants met mastery criteria, which was defined as completing three consecutive sessions at 100% steps correct for at least five sessions. All participants during baseline probing remained primary at 0% steps correct with exception to Howard who scored one baseline session at 12.5%. During baseline probing, for all target skills none of the participants responded to the safety scenarios and stated that they do not know what to do meeting discontinue criteria to end the session. During BST training, participant's sessions were discontinued due to them missing a step in the task analysis for all target skills. Additionally, during post-training, Raj had one session in a target skill where he missed a step, which discontinued that session. Amy and Howard met 100% for all target skills in post-training. Effectiveness of BST was evaluated by comparing baseline to post-training. Using visual analysis, we saw with each participant in each target skill had an immediacy in change in level when comparing baseline to post-training session where baseline stayed relatively at 0% and post-training immediately rose to 100% and remained high until mastery criteria was met for all participants and target skills.

Additionally, effect size was calculated using NAP to evaluate effect size between baseline and post-training, baseline and generalization, and baseline and maintenance. Overall, all participants had large effect sizes across all target skills. It is important to note that the effect

size for baseline to maintenance was large but to be taken with caution due to the limitations of the parameters of NAP. Although the effect size for baseline and maintenance for all target behaviors across participants were high, all participants scored significantly lower in maintenance, which indicated that skills were not maintainable over a one week follow up session.

Similar multiple probe designs as Ergenekon (2012), Gast et al. (1992), Kearney et al. (2012), Marchand-Martella et al. (1992), and Timko and Sainato (1990), and vertical analysis were used to evaluate if target skills are indeed acquired through BST and no other variable is affecting skill acquisition. This was evaluated by staggering when BST was implemented for all participants for each target skill, meaning each participant would enter BST at different times per target skill, allowing for vertical analysis. While a participant completed BST and moved into post-training, all successive target skills remained in baseline. For all participants across all target skills, baseline probes in successive target skills remained low while target skills, which have gone through BST, were evaluated to remain acquired in post-training sessions which indicates that BST was effective at teaching CPR and first aid skills. It was only after BST that target skills were acquired through post-training assessment sessions.

Generalization of CPR and First Aid Skills

The study additionally sought to evaluate if target skills once acquired are generalizable. Similar to Gast et al. (1992), Ergenekon (2012), and Marchand-Martella et al. (1992) generalization was assessed across individuals. This was evaluated through having a trained novel therapist who did not participate in both baseline, and post-training sessions ask each participant to respond to each of the six-target skill scenarios. Across all participants, all scored at 100% steps correct for all target skills in the generalization session with exception to Raj who scored at 91% steps correct

in dislocation, thus indicating that BST was effective at generalizing CPR and first aid skills across individuals.

Maintenance of CPR and First Aid Skills

This study sought to evaluate if mastered CPR and first aid target skills are maintainable over time. A probe was provided to each participant following a week after completing baseline, post-training, and generalization probes. The findings of this study suggest that acquisition of CPR and first aid skills learned through BST are not maintainable for all participants in each target skill with exception to Howard's maintenance session for dislocation where he scored 83% steps correct.

Maintenance probes across all target skills for all participants significant dropped following the one-week maintenance probe. These results are similar to what Gast et al. (1992) found during their maintenance probes with their participants. Based off maintenance suggestions from Gast et al., participants with disabilities (intellectual and developmental disabilities) should have multiple exposures to mastered skills following completion of the training program to evaluate if the training program is indeed maintainable over time, in addition to, allowing researchers the opportunity to assess if training needs to be continued following maintenance probing.

The current study only probed once for maintenance instead of continuously probing, similar to how Gast et al. (1992) probed maintenance five times. Gast et al. (1992) also suggested identifying specific error types in maintenance probes to determine why each participant was not performing at mastery. In this study, the researchers identified error types per phase and probe type, including maintenance. All participants in this study met discontinue criteria in maintenance due to missed steps. This means each participant was stopped following

one consecutive incorrect step in the task analysis instead of allowing them to attempt all steps and counting correct consecutive steps in the percentage of correct steps for that session. The researchers chose to include a strict discounted rule due to the medical risk of not performing these CPR and first aid skills in its prescribed order.

Gast et al. (1992) also suggested the use of discriminative stimuli when teaching multiple skills at the same time to assist participants in being able to discriminate between first aid skills being learned. This study used similar methods as to Gast et al. (1992) where each participant was presented with a vignette for each target skill which operated as the discriminative stimuli per each condition.

When comparing the complexity of skills taught in this study to previous literature, this study was the first to follow steps to its exact specifications of a first aid training program (American Heart Association CPR and First Aid certification program) it was emulating. In doing so, the skills taught in this study in comparison previous studies, included far more complex skills whereas previous literature only evaluated seeking adult attention and tending to minor cuts, scrapes, and bruises. This is the first study to evaluate such complex skills with a population including individuals with ID, which in turn may contribute to why the participants in this study did not maintain CPR and first aid skills during maintenance probing. Results from this study contradict the majority of the current literature pertaining to the use of BST for first aid skills and their ability to be maintained. Further exploration into multiple modalities of the study (e.g., continuous probing of maintenance, discriminative stimuli, complexity of skills) should be evaluated to validate this studies findings.

Limitations and Future Research

Although the results of this study are both reliable and valid, the study was not without its limitations. The first of which is this study only included three participants throughout the study. Although all participants met inclusionary criteria, this is not a representative sample pertaining to individuals with ID. Additionally, participants included in this study had a reported diagnosis of intellectual disability but were all enrolled in a university based post-secondary program, which required a high level of autonomy and adaptive skills; therefore, participants did not represent various severity levels of ID. Future research should replicate the current study with participant with various levels of severity of ID. This would allow researchers to potentially identify if the methods used in this study are appropriate for teaching these skills to this population depending on severity level and what modifications may need to be made to the methodology. Additionally, single case design research methodologies use smaller sample sizes are used to evaluate treatment effects with its participants compared to other research methodologies (e.g., quantitative, qualitative). Replication of this study contributes to the validity of the study by examine effects of this treatment with adults with ID.

Although generalization probes across all participants and target skills were high, future research should evaluate other parameters of generalization including generalization across settings. In previous research evaluating BST to teach first aid skills Spooner et al. (1989) and Timko and Sainato (1990) evaluated generalization across settings including residences, schools, and outdoor areas. Future research should explore generalization procedures evaluating targeted skills in novel settings.

Additionally, the current study implemented all treatment components with exclusion to maintenance sessions in a single day taking eight to nine hours to complete for each participant. This study was designed to emulate the timeframe it would take to complete a traditional CPR

and first aid certification programs. Treatment outcomes in BST, post-training, and generalization for all participants in all target skills were completed correctly at a high percentage of steps complete, which in turn may have been affected by how quickly the training was completed using a single day. In contrast, this may have negatively affected the retention of skills, which were evident in the maintenance probes where all participants had a significant decrease in percentage of steps correct for most of the mastered target skills.

Booster sessions are a common method of maintaining acquired skills in post-training assessment. Hamrick et al. (2020) described booster sessions as representing the procedures of BST during post-training sessions if the participant fell below a pre-determined percentage of correct steps (e.g., 80%). Once the participant reached 100% steps correct, post-training procedures could be continued using the multiple probe design procedures. By extending the study to more than one day of training, it would allow for further assessment in post-training to assess acquisition of mastered skills. Future research should evaluate the use of booster sessions following meeting mastery criteria in post-training to evaluate maintenance of mastered skills.

Lastly, although this study found that BST is effective and generalizable further replication is needed to validate the current methodology used to conduct this study. This study extended the current literature on teaching first aid skills to individuals with intellectual disabilities through teaching complex CPR and first aid skills, which were emulated by the American Heart Association's training procedures while the current literature only focused on addressing minor cuts, burns, or seeking adult assistance. Future replication research is needed to validate the use of BST to teach CPR and first aid skills to young adults with intellectual disabilities.

Implications

Despite the vast evidence suggesting that many individuals with ID do not have the skills to responds to dangerous situations, little has been empirically examined on teaching safety skills for this population. Such hindrances directly compromise the quality of life and autonomy for these individuals. Although evidence strongly suggests the need for training individuals with ID who do not have critical safety skills, this is often neglected for this group by therapists, parents, and school personnel (Dixon et al., 2010). The results of the current study implicate that BST training was effective at teaching CPR and first aid skills to young adults with ID who did not previous have those skills. The expansion of this study to teach complex lifesaving skills contributes to the limited literature of teaching first aid skills to this specific population. Behavior skills training has been validated over vast amounts of safety skills (e.g., firearm safety, pedestrian safety, fire safety, stranger safety) and has been used by therapists, teachers, and parents to produce effective outcomes. Results of this study suggest that complex lifesaving skills can be taught to individuals with ID and future research is needed to both validate and evaluate how young adults undergoing this training can maintain acquisition of the CPR and first aid target skills learned.

Conclusion

Researchers suggest that safety skills instruction has been neglected amongst individuals with intellectual disabilities (Argan, 2004; Argan et al., 2008). Unfortunately, teachers and parents have had the perception that individuals with intellectual disabilities have been taught safety skills or are incapable to learn a particular safety skill. (Shi et al., 2015). The purpose of the current study was to extend the previous literature on effective strategies for teaching individuals with intellectual disabilities CPR and first aid safety skills. Overall, the current

study's results suggest that an intervention package including behavior skills training to teach six CPR and first aid target skills was effective at teaching all six-target skills. Mastered target skills were also generalizable across individuals for all three participants, but not maintainable during a one-week follow up sessions. Future research should continue to focus on exploring the effectiveness, generalization, and maintenance of these results.

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APPENDIX A

IRB APPROVAL

Protocol ID: IRB-20-192

Principal Investigator: Daniel Gadke

Protocol Title: Evaluating the Effectiveness of Behavioral Skills Training for Teaching CPR and First Aid Skills to Young Adults with Intellectual Disabilities

Review Type: FULLBOARD

Approval Date: August 07, 2020

Expiration Date:August 06, 2021

The above referenced study has been approved. *For Expedited and Full Board approved studies, you are REQUIRED to use the current, stamped versions of your approved consent, assent, parental permission and recruitment documents.*

To access your approval documents, log into myProtocol and click on the protocol number to open the approved study. Your official approval letter can be found under the Event History section. All stamped documents (e.g., consent, recruitment) can be found in the Attachment section and are labeled accordingly.

If you have any questions that the HRPP can assist you in answering, please do not hesitate to contact us at irb@research.msstate.edu or 662.325.3994.

APPENDIX B

SCREENING PROTOCOL AND INCLUSION CRITERIA

Screening Protocol

Screening Protocol

1. Potential participants for this study were identified.
2. Consent forms for participant of this study completed.
3. Participants sign an agreement indicating they understand participation in the study is contingent upon meeting the inclusionary criteria.
4. Administer demographic form.
5. Review the documentation the determine of the participant meets the criteria for an intellectual disorder.
6. Determine inclusion in the study.

Participant Demographic Questionnaire

Demographic Questionnaire

Directions: Please fill out the following information below.

Participant Name: _____ Date of Birth: _____

Diagnosed Disability: _____

Circle One:

White

African American

Asian/Pacific Islander

Hispanic

Other: _____

Circle one:

Male Female

Are you familiar with CPR and First Aid?

Yes No

Circle "yes" or "no" for the following questions:

Have you ever taken a CPR and/or First Aid course? Yes No

APPENDIX C

TASK ANALYSES

Researcher Copy of Concussion Task Analysis

Data Collection: Concussion Task Analysis

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **The victim has hit his/her head on a bench and is now bleeding. A bystander notices the injury and asked if anyone is CPR/First aid certified.**

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available

_____ 2) Direct someone to call 911

_____ 3) Ensure that bystanders or other staff go to the door to meet University Police/EMS

_____ 4) Check that the scene is safe. (**THE SCENE IS SAFE)**

_____ 5) Check the victim and ask *"*are you okay?" **(THE VICTIM RESPONDS HE/SHE ARE FEELING DIZZY)**

_____ 6) Tell the victim that you are first aid certified and want to help; obtain consent

_____ 7) Help the victim to a seated position

_____ 8) Put on gloves

_____ 9) Apply pressure to the cut on the forehead with a clean gauze pad

_____ 10) Apply additional dressings as needed

_____ 11) Ask questions while applying pressure (**THE VICTIM DOES NOT REMEMBER MUCH)**

Examples: "*What is your name?" "How old are you?" "Do you remember what happened?"*

_____ 12) Stay with the victim until University EMS arrive (**EMS HAVE ARRIVED**)

Additional Steps:

(THE VICTIM IS COMPLAINING OF FEELING NAUSEOUS AND CANNOT SEE STRAIGHT)

_____ 13) Do not move the victim

_____ 14) Ask victim if they would like to lie down to help with dizziness

_____ 15) If nauseous, get a trash can

Percentage of steps completed correctly: ___ /15 = ____%

Researcher Copy of CPR+AED Task Analysis

Data Collection: CPR/AED

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **A nearby person starts to feel severe chest pains. A witness is saying their friend is having severe chest pain and needs help right away! What should you do next?**

Steps to Complete:

_____ 1) Grab the AED and first aid kit from its designated location if available
_____ 2) Check that the scene is safe. (**THE SCENE IS SAFE)**
_____ 3) Check the victim by shouting "are you okay, are you okay" and tap shoulder **(THE VICTIM DOES NOT RESPOND)**
_____ 4) Direct someone to call 911
_____ 5) Ensure that bystanders or other staff open doors to meet EMS
_____ 6) Open the airway
_____ 7) Do a 10-second check for breathing and other signs of life (**THERE ARE NO SIGNS OF LIFE)**

____ Begin CPR
____ Turn on AED and follow instructions
____ Continue CPR until prompted by AED
____ Ensure no one and no objects are in contact with the person during AED analyzing and shocking

_____ 8) Continue until one of the following occurs: **(ASK STAFF MEMBER TO LIST REASONS THEY WOULD STOP)**

1. University Police/EMS or another trained responder arrives and takes over
2. Person shows sign of life
3. The scene becomes unsafe
4. Responder is too exhausted to continue

Percentage of steps completed correctly: ___ /8= ____%

Researcher Copy Dislocation Task Analysis

Data Collection: Dislocation Review

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **A person is playing basketball at a public basketball court when he/she runs into another player and dislocates their shoulder. What should you do next?**

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available
_____ 2) Check that the scene is safe. (**THE SCENE IS SAFE)**
_____ 3) Put on PPEs
_____ 4) Check the victim and ask "are you okay?" (**THE VICTIM RESPONDS THAT HIS/HER SHOULDER HURTS VERY BADLY)**
_____ 5) Tell the victim that you are first aid certified and want to help; obtain consent
_____ 6) Ask the victim if they want you to contact EMS
_____ 7) Tell the victim NOT to move his/her injured shoulder
_____ 8) Assist victim to seated personal while keeping arm stabilized
_____ 9) Ensure bystanders open doors or are looking for EMS to arrive
_____ 10) Stay with the victim and try to keep them calm until EMS arrives

(WHILE WAITING FOR UNIVERSITY POLICE/EMS WHAT SHOULD YOU BE DOING?)

_____ 11) Monitoring the victim's ABC's and watching for signs of shock

Percentage of steps completed correctly: ___ /11 = ____%

Researcher Copy of Fainting Task Analysis

Data Collection: Fainting Task Analysis

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **(The victim was participating in open recreation exits the gym after a basketball game and falls to the ground. A player in the gym notices the unconscious person and notifies you, the staff member. What should you do next?)**

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available

_____ 2) Check that the scene is safe. (**THE SCENE IS SAFE)**

_____ 3) Check for responsiveness and breathing

_____ 4) Gather as much information as possible (**I JUST FELT LIGHT-HEADED AND FELL)**

_____ 5) If the person is not responsive and is not breathing begin CPR immediately and use an AED as soon as one is available (**THE PERSON IS RESPONSIVE**)

_____ 6) Call 911 if the person is injured or if you have any concerns about the person's condition (**THE PERSON IS NOT INJURED**)

_____ 7) Put the person in a chair or on the ground in recovery position, if there are no injuries

_____ 8)Monitor ABC's

_____ 9) Stay with person until EMS or someone else arrives. (**A FRIEND JUST ARRIVED TO TAKE THEIR FRIEND HOME**)

Percentage of steps completed correctly: ___ /9 = ____%

Researcher Copy FirstAid Task Analysis

Data Collection: First Aid Review

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **A person is walking on the street when he/she fell and severely cuts his/her arm.**

What should you do next?

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location
_____ 2) Check that the scene is safe. (**THE SCENE IS SAFE)**
_____ 3) Tell the victim that you are first aid certified and want to help; obtain consent
_____ 4) Assist person to a seated position
_____ 5) Put on necessary PPEs (gloves)
_____ 6) Apply pressure with a clean gauze pad
_____ 7) Use roller bandage to secure the gauze pad in place and create additional direct pressure
(**THE VICTIM HAS BEGUN TO SHOW SIGNS OF SHOCK**)
_____ 8) Ask questions such as "Can you tell me what building you are in? What day of the week is it?"
_____ 9) Direct someone to call 911
_____ 10) Ensure bystanders are looking for EMS to arrive
_____ 11) Assist person to the recovery position
(WHILE WAITING FOR POLICE/EMS WHAT SHOULD YOU BE DOING?)
_____ 12) Monitor ABC's until EMS arrives

Percentage of steps completed correctly: ___ /12 = ____%

Researcher Copy of Seizure Task Analysis

Data Collection: Seizures Task Analysis

THE PRIMARY OBSERVER SHOULD VERBALIZE WORDS IN BOLDED PARENTHESES TO THE PARTICIPANT

Situation: **The victim has fallen on their head and begins having a seizure. What should you do next?**

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location
_____ 2) Direct someone to call 911
_____ 3) Ensure that bystanders are looking to meet EMS
_____ 4) Check that the scene is safe. (**THE SCENE IS SAFE)**
_____ 5) Do NOT hold or restrain the person, this may cause more injuries
_____ 6) Move nearby objects that may cause injury
_____ 7) Protect the person's head by placing a thin cushion beneath it
_____ 8) After the seizure is over, place the victim on his/her side so that blood or any other fluids may drain from his/her mouth
_____ 9) Check for life threatening conditions and any other injuries
_____ 10) Stay with the victim until he/she is fully conscious/aware of surroundings or until EMS arrives

(WHILE WAITING FOR POLICE/EMS WHAT SHOULD YOU BE DOING?)

_____ 11) Monitoring the victim's ABC's
_____ 12) Try to keep others from getting too close

Percentage of steps completed correctly: ___ /12= ____

Student Copy of Concussion Task Analysis

Student: Concussion Task Analysis

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: The victim has hit his/her head on a bench and is now bleeding. A bystander notices the injury and asked if anyone is CPR/First aid certified.

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available
_____ 2) Direct someone to call 911
_____ 3) Ensure that bystanders or other staff go to the door to meet EMS
_____ 4) Check that the scene is safe.
_____ 5) Check the victim and ask ***"are you okay?"***
_____ 6) Tell the victim that you are first aid certified and want to help; obtain consent.
_____ 7) Help the victim to a seated position
_____ 8) Put on gloves
_____ 9) Apply pressure to the cut on the forehead with a clean gauze pad
_____ 10) Apply additional dressings as needed
_____ 11) Ask questions while applying pressure

Examples: "***What is your name?" "How old are you?" "Do you remember what happened?"***

_____ 12) Stay with the victim until EMS arrive (**EMS HAVE ARRIVED**)

Additional Steps:

IF THE VICTIM COMPLAINS OF BEING NAUSEOUS AND CANNOT SEE STRAIGHT

_____ 13) Do not move the victim
_____ 14) Ask victim if they would like to lie down to help with dizziness
_____ 15) If nauseous, get a trash can.

Student Copy of CPR+AED Task Analysis

Student: CPR/AED Task Analysis

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: **A nearby person starts to feel severe chest pains. A witness is saying their friend is having severe chest pain and needs help right away! What should you do next?**

Steps to Complete:

_____ 1) Grab the AED and first aid kit from its designated location if available
_____ 2) Check that the scene is safe
_____ 3) Check the victim by shouting "***are you okay, are you okay***" and tap shoulder
_____ 4) Direct someone to call 911
_____ 5) Ensure that bystanders or other staff open doors to meet EMS if needed
_____ 6) Open the airway
_____ 7) Do a 10-second check for breathing and other signs of life

____ Begin CPR
____ Turn on AED and follow instructions
____ Continue CPR until prompted by AED
____ Ensure no one and no objects are in contact with the person during AED analyzing and shocking

_____ 8) Continue until one of the following occurs:

1. EMS or another trained responder arrives and takes over
2. Person shows sign of life
3. The scene becomes unsafe
4. Responder is too exhausted to continue

Student Copy of Dislocation Task Analysis

Student: Dislocation Review

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: A person is playing basketball at a public basketball court when he/she runs into another player and dislocates their shoulder. What should you do next?

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available
_____ 2) Check that the scene is safe
_____ 3) Put on PPEs
_____ 4) Check the victim and ask "***are you okay***?"
_____ 5) Tell the victim that you are first aid certified and want to help; obtain consent
_____ 6) Ask the victim if they want you to contact EMS
_____ 7) Tell the victim NOT to move his/her injured shoulder
_____ 8) Assist victim to seated personal while keeping arm stabilized
_____ 9) Ensure bystanders open doors or are looking for EMS to arrive
_____ 10) Stay with the victim and try to keep them calm until EMS arrives

Additional Steps:
WHILE WAITING FOR EMS WHAT SHOULD YOU BE DOING?
_____ 11) Monitoring the victim's ABC's and watching for signs of shock

Student Copy of Fainting Task Analysis

Fainting Task Analysis

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: You are out in public and someone falls to the ground. A bystander notices the unconscious person and ask if anyone is CPR/First aid certified. What should you do next?

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available
_____ 2) Check that the scene is safe.
_____ 3) Check for responsiveness and breathing
_____ 4) Gather as much information as possible
_____ 5) **IF** the person is not responsive and is not breathing begin CPR immediately and use an AED as soon as one is available
_____ 6) Call 911 if the person is injured or if you have any concerns about the person's condition
_____ 7) Put the person in a chair or on the ground in recovery position, if there are no injuries
_____ 8) Monitor ABC's
_____ 9) Stay with the person until EMS or someone comes to pick him/her up.

Student Copy of FirstAid Task Analysis

Student: First Aid Review

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: A person is walking on the street when he/she fell and severely cuts his/her arm. What should you do next?

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location
_____ 2) Check that the scene is safe.
_____ 3) Tell the victim that you are first aid certified and want to help; obtain consent
_____ 4) Assist person to a seated position
_____ 5) Put on necessary PPEs (gloves)
_____ 6) Apply pressure with a clean gauze pad
_____ 7) Use roller bandage to secure the gauze pad in place and create additional direct pressure

Additional Steps

THE VICTIM HAS BEGUN TO SHOW SIGNS OF SHOCK

_____ 8) Ask questions such as "***Can you tell me what building you are in? What day of the week is it***?"
_____ 9) Direct someone to call 911
_____ 10) Ensure bystanders are looking for EMS to arrive
_____ 11) Assist person to the recovery position

WHAT SHOULD YOU BE DOING WHILE WAITING FOR POLICE/EMS

_____ 12) Monitor ABC's until EMS arrives

Student Copy Seizure Task Analysis

Student: Seizures Task Analysis

*Words in ***bolded italics*** should be verbalized by the responder*

Situation: The victim has fallen on their head and begins having a seizure. What should you do next?

Steps to Complete:

_____ 1) Grab the first aid kit from its designated location if available
_____ 2) Direct someone to call 911
_____ 3) Ensure that bystanders are looking to meet EMS
_____ 4) Check that the scene is safe
_____ 5) Do NOT hold or restrain the person, this may cause more injuries
_____ 6) Move nearby objects that may cause injury
_____ 7) Protect the person's head by placing a thin cushion beneath it
_____ 8) After the seizure is over, place the victim on his/her side so that blood or any other fluids may drain from his/her mouth
_____ 9) Check for life threatening conditions and any other injuries
_____ 10) Stay with the victim until he/she is fully conscious/aware of surroundings or until EMS arrives

Additional Steps:

WHAT YOU SHOULD BE DOING WHILE WAITING FOR UNIVERSITY POLICE/EMS
_____ 11) Monitor the victim's ABC's
_____ 12) Try to keep others from getting too close

APPENDIX D

TREATMENT INTEGRITY FORMS

Treatment Integrity Baseline Condition

Participant Name: _____ Date: _____ IOA: Yes No

Observer 1: _____ Observer #2: _____

Condition:_____ Scenario:_____

Baseline BST

Step:	Completed:
1. Set up scene scenario.	
2. Provide instructions to the Participant: *"How would you respond to this safety scenario?"*	
3. The session was terminated if one of the three conditions occur: Participant stated that he/she was done, stated he/she did not know what to do, or when 30-seconds passed without activity. No feedback was delivered during baseline.	
4. Record and calculate the percent of task analysis completed correctly.	

Signature: _____ Date: _____

Treatment Integrity Form BST Training

Participant Name: _____ Date: _____ IOA: Yes No

Observer 1: _____ Observer #2: _____

Condition:_____ Scenario:_____

BST Training

Step:	Completed:
1. Set up scene scenario.	
2. Provide instructions to the Participant with modeling: "I am now going to show you the steps to take for responding to _____. A task list has been placed in front of you to use to follow along with me while I read the steps."	
3. "I am now going to model the way to respond to_____." "Make sure you are paying attention to what I am doing and following along with your Task Sheet in from of you". Model the _____ condition.	
4. Following the modeling stage, Participant was instructed to rehearse the steps. "I now want you to show me how you would respond to _____. Corrective feedback was provided as Participant performed the steps to the task analysis.	
5. The session was terminated if one of the three conditions occur: Participant stated that he/she was done, stated he/she did not know what to do, or when 30-seconds passed without activity.	

6. Record and calculate the percent of task analysis completed correctly per trial.	

Signature: _____ Date: _____

Treatment Integrity Form Post-Training with In-situ

Participant Name: _____ Date: _____ IOA: Yes No

Observer 1: _____ Observer #2: _____

Condition: _____ Scenario: _____

Post-Training with In-Situ Training

Step:	Completed:
1. Set up scene scenario.	
2. Provide instructions to the Participant with w/o modeling: *"How would you respond to this safety scenario _____?"*	
3. Participant was instructed to complete the steps. Corrective feedback was provided as Participant performed the steps to the task analysis once a step was either missed, participant stated that he/she was done, participant stated he/she did not know, or when 30-seconds passed without activity. **Immediately stop the participant at the step as to which one of the three conditions occurs and proceed to model the incorrect step made by the participant and the remaining portion of the task analysis to the participant.** (In-situ procedure)	
4. Record and calculate the percent of task analysis completed correctly per trial.	

Signature: _____ Date: _____

Treatment Integrity Form Generalization Probe

Participant Name: _____ Date: _____ IOA: Yes No

Observer 1: _____ Observer #2: _____

Condition: _____ Scenario: _____

Generalization BST

Step:	Completed:
1. Set up scene scenario.	
2. Provide instructions to the Participant: *"How would you respond to this safety scenario?"*	
3. The session was terminated if one of the three conditions occur: Participant stated that he/she was done, stated he/she did not know what to do, or when 30-seconds passed without activity. No feedback was delivered during post-training.	
4. Record and calculate the percent of task analysis completed correctly.	

Signature: _____ Date: _____

Treatment Integrity Form Maintenance Probe

Participant Name: _____ Date: _____ IOA: Yes No

Observer 1: _____ Observer #2: _____

Condition: _____ Scenario: _____

Maintenance BST

Step:	Completed:
1. Set up scene scenario.	
2. Provide instructions to the Participant: *"How would you respond to this safety scenario?"*	
3. The session was terminated if one of the three conditions occur: Participant stated that he/she was done, stated he/she did not know what to do, or when 30-seconds passed without activity. No feedback was delivered during post-training.	
4. Record and calculate the percent of task analysis completed correctly.	

Signature: _____ Date: _____

APPENDIX E

SOCIAL VALIDITY MEASURE

Social Validity Measure

Name: _____ Date: _____

Modified-Children's Intervention Rating Scale

Please evaluate the intervention by circling the number which describes your agreement or disagreement with each statement. You must answer each question.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Neither Agree nor Disagree	Agree	Strongly Agree
It was easy to follow the directions.	1	2	3	4	5	6	7
The Instructor was too Harsh on me	1	2	3	4	5	6	7
The method used to	1	2	3	4	5	6	7

teach me CPR and First Aid skills may cause problems with my friends.							
There are better ways to teach CPR and First Aid skills besides the training I had.	1	2	3	4	5	6	7
The teaching method	1	2	3	4	5	6	7

used by the instructor would be a good one to use with other people							
I liked the training used for learning CPR and First Aid Skills	1	2	3	4	5	6	7
I think that the training I was provided for CPR and First	1	2	3	4	5	6	7

Aid would help me be a better adult.							

Source: Adapted from Witt, J.C. & Elliott, S.N. (1985). Acceptability of classroom intervention strategies. In Kratochwill, T.R. (Ed.), Advances in School Psychology, Vol. 4, 251 – 288. Mahwah, NJ: Erlbaum.

APPENDIX F

HISTORY TRAINING OUTLINE

History Training Outline

Methods of instruction:

- Lecture
- Power Point presentation
- Modeling appropriate procedures

Materials used:

- Computer with PowerPoint capabilities
- PowerPoint Presentation
- CPR and First Aid dummy
- First aid kit
    - Bandages
    - Tape
    - Rubber gloves
- AED kit

Power Point Content:

- Definitions of medical acronyms used in task analyses.
    - CPR- Cardiopulmonary Resuscitation
    - AED- Automated External Defibrillator
    - PPE- Personal Protective Equipment
    - EMS- Emergency Medical Services
- Procedures to Perform Basic CPR
    - Lie the person down
    - Tilt head back

    - Begin compressions (30 repetitions)
    - Give breaths (2 repetitions)
    - Repeat cycle until EMS arrive or until exhaustion
- Procedures to use an AED.
    - Make sure individual is dry
    - Turn on AED
    - Prepare chest area
    - Let the AED analyze
    - Shock the victim
    - Continue CPR