EFFECTIVENESS OF PRESCHOOL PARENT TRAINING FOR TBI PREVENTION
AND RESPONSE

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Educational Specialist in School Psychology

By
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Dayton, Ohio
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EFFECTIVENESS OF PRESCHOOL PARENT TRAINING FOR TBI PREVENTION
AND RESPONSE

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ABSTRACT

EFFECTIVENESS OF PRESCHOOL PARENT TRAINING FOR TBI PREVENTION AND RESPONSE

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Preschool-aged students are at an increased risk for injury, specifically traumatic brain injury (TBI). Various home factors contribute to risk of initial injury as well as severity of effects following injury. The present study examined the effectiveness of a training to increase low-income parents of preschoolers’ awareness of TBI, confidence to respond to TBI, and knowledge of what to do after a possible TBI scenario. Forty parents participated in a one-hour scenario-based training. Data were collected via pre- and post-tests, including demographic questions. Results indicated that the training significantly increased parental awareness of TBI, confidence to respond to TBI, and knowledge of what to do in a possible TBI situation. No significant correlations were found between the demographic factors and knowledge prior to the training. Implications of the study support the use of educational training programs to increase awareness and confidence in parents of preschoolers surrounding the topic of TBI.
Dedicated to my parents, whose love, support, and sacrifices have made it possible for me to achieve any of the successes I’ve had.
ACKNOWLEDGEMENTS

I would like to thank my incredibly supportive family and friends. Their continual encouragement and interest in my research has made my graduate studies a joy. I would also like to thank my thesis chair, Dr. Susan Davies, for being excited about my research, assisting me with navigating through my first grant, and giving me opportunities to share my research with new audiences. Thank you to my other thesis committee members, Dr. Elana Bernstein for never missing an editing detail, and Dr. Shauna Adams for providing helpful feedback about engaging families. Thank you to the Stark County Health Department’s Child Injury Action Group for providing me with a grant to print training materials and purchase bike helmets to provide additional practice for parents. Thank you to Miami Valley Child Development Centers and their wonderfully accommodating center directors for allowing me to present at several of their locations. Thank you to my internship supervisor, Nick DeGrazia, for helping me with my data analysis. Lastly, thank you to all of the parents who participated in the training sessions for allowing me to share knowledge and learn from your experiences at the same time.
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CHAPTER I
INTRODUCTION

The preschool years (ages 3-5), are a season of significant change and development for children. The preschool child’s brain shows some of its largest changes both anatomically and physiologically during this time. Preschool children demonstrate tremendous growth physically, cognitively, emotionally, and socially. At this age, children explore their worlds by asking questions, trial and error, and actual physical exploration. This exploratory nature unavoidably leads to another defining factor of this time of life: a preschooler’s risk for injury.

Factors that contribute to preschool injury are complex and multifaceted (Simpson, Turnbull, Ardagh, & Richardson, 2009), including household dynamics (Andrade, Cordovil, & Barreiros, 2013), biological contributions like ADHD (Ayaz, Ayaz, & Soylu, 2015), and parent factors (Reading, Jones, Haynes, Daras, & Edmond, 2008). Among these factors, those related to parenting are evidenced frequently in the literature and are most easily modified. For example, a child’s diagnosis of ADHD is not changeable, but it is possible to improve the surveillance habits of the parent of that child.

Problem Statement

One type of preschool injury is traumatic brain injury (TBI). According to the National Center for Health Statistics, children ages 0-4 had the highest rate of TBI-related
emergency department visits from 2001-2010. Their rate was typically twice as high as the group with the second highest TBI-related emergency department visit rate (15-20 year olds). A TBI can affect a developing preschooler in many ways. Preschoolers who have sustained TBIs often show behavioral deficits, executive functioning deficits, and social-emotional deficits (Anderson et al., 2009; Anderson et al., 2010; Bellerose, Bernier, Beaudoin, Gravel, & Beauchamp, 2015). Fewer family resources (Potter et al., 2011) and socioeconomic environmental disadvantage (Taylor, Swartwout, Yeates, Walz, Stancin, & Wade, 2008) put preschoolers at an increased risk of suffering more deficits after sustaining a TBI. Because preschoolers cannot control these factors, interventions that target the children are not the logical next step. Targeting parents to increase awareness about their children’s risk level can be effective.

No known studies have examined interventions aimed at increasing parent awareness, knowledge, and confidence in the preventing and responding to preschool TBI. Researchers and practitioners need to know what strategies work best for engaging parents in this issue. Specifically, there is a need to develop effective training programs focused on TBI prevention and response for parents of preschoolers.

**Purpose of the Research**

The purpose of this study was to examine strategies for training parents in injury prevention and response. Because the current research lacks evidence of existing trainings that focus on parents in regard to preschool TBI, a training curriculum was developed for this study. The present study examined the efficacy of such a training when used with parents whose children attend Head Start preschool programs.
CHAPTER II
LITERATURE REVIEW

The first section of this literature review addresses the preschool student’s brain development, which includes cognitive, emotional, social, and motor skills. The second section explores injuries in preschoolers and addresses factors that contribute to injury, specifically traumatic brain injury. The topic of traumatic brain injury in preschoolers is subdivided into the effects of injuries and contributing factors. The third section of this literature review examines parent factors, injury prevalence, and parent knowledge in the Head Start population. Finally, it addresses how interventions and training programs can be used to decrease risks for injury and increase parent knowledge.

Preschool Brain Development

The preschool years (ages 3-5) are in a time of intense growth and development. The preschool brain shows some of its largest changes both anatomically and physiologically during this time. The emphasis of development is on growth and expansion; neuronal connections are pruned later through maturation and experience. Changes occur in cortical area, thickness, and volume (Brown & Jernigan, 2012). These physiological changes contribute to many functional changes in preschool students.

Just as cognitive capacities are developing, the preschool child is developing emotionally as well. During the preschool period, children develop self-awareness, the ability to regulate feelings, perspective taking, and increasingly complex emotions such
as pride, shame, or guilt. They also develop a self-concept as well as the ability to alter the emotions they express based on the situation (McCabe & Altamura, 2011). Because of this emotional growth, many preschools incorporate social-emotional training into their curricula.

Motor coordination is another area children are developing during the preschool period. This development differs between each child, as it depends on many different connections between cortical and subcortical regions of the brain; typically, motor and sensory areas of the brain are the first to mature (Pick, Hands, & Licari, 2012). Additionally, motor development differs between genders. Typically, boys are better at skills such as walking, jumping, and hopping, and girls excel more at balancing skills, flexibility tasks, and fine motor skills (Pick, Hands, & Licari, 2012).

**Risk for Preschool Injury**

Because the preschool student is still developing motor skills and coordination, injuries are quite common. Researchers have examined a number of contributing factors to preschool injuries. Simpson, Turnbull, Ardagh, and Richardson (2009) interviewed 100 caregivers of children aged zero to four years old who were seen in the emergency department for an injury that occurred in the home. The researchers found that the context in which child injuries occur is often complex and multifaceted. However, common factors include unrealistic expectations of children and the acceptance of injury as the norm. Unrealistic expectations of children included expecting them to remember being told not to do something, or expecting them to have learned not to do something dangerous, when they may have never been explicitly taught. Parents displayed acceptance of injury as the norm by assuming that all children get injured; they believed
injury was unavoidable in their own children as well (Simpson, Turnbull, Ardagh, & Richardson, 2009).

Andrade, Cordovil, and Barreiros (2013) conducted interviews of 335 parents and found that in children ages one to five, medically attended injuries (injuries treated in a hospital or emergency department) most often occurred in boys with brothers and in households with four or more persons. Reading, Jones, Haynes, Daras, and Edmond (2008) analyzed longitudinal cohort data to examine the many complex factors that contribute to risk for injury. They found that child, parent, and household factors contribute more to risk for injury than neighborhood factors such as physical environment or community-based factors. Risk was also higher in children with younger mothers, non-white mothers, mothers who smoked, mothers who drank more than 21 units of alcohol a week, and mothers who had lower social levels of support. Interestingly, an increased risk was also seen in children of mothers with higher levels of educational attainment. The authors believed that the positive association between maternal education and risk of injury could be attributed to a readiness to report injury in mothers with higher levels of education and not an actual higher level of risk.

Medical diagnoses, such as ADHD, can be a contributing factor to injury in preschool-age youth as well. For 237 preschool children diagnosed with ADHD, Ayaz, Ayaz, and Soylu (2015) found an association between the rate of unintentional injuries and factors such as male gender, externalizing behavior problems, and parental separation. Another contributing factor to injury is lack of sleep. Koulouglioti, Cole, and Kitzman (2008) collected data from 278 mothers of 18-month to 4-year-old children. They examined the number of medically attended injures sustained and information
reported regarding the child’s sleep habits. They found that children who did not get enough sleep (as reported by the mothers) sustained a higher number of medically attended injuries.

Because of the many risk factors for injury in preschool students, researchers have examined various interventions aimed at decreasing these risks. For example, training programs on topics such as how to appropriately use child restraints (car seats) have been developed (Ivers et al., 2011). However, interventions addressing preschool injury are often too specific in nature, don’t address the complex environments in which injuries occur, or are poorly delivered, and the intervention is not implemented exactly as intended (Simpson & Nicholls, 2012). These shortcomings need to be addressed when developing interventions for reducing preschool injury.

**Preschool TBI**

One specific kind of preschool injury is traumatic brain injury (TBI). TBI occurs when a person sustains a blow or bump to the head, which causes a disruption in brain functioning (Centers for Disease Control and Prevention, 2016). This type of injury can have significant adverse effects on a child’s overall functioning. No matter the age at which the injury occurs, children who have had TBI are at an increased risk for impairment in executive functioning, and when the injury occurs at age 3 or before, children experience even more deficits (Anderson et al., 2010). Executive functions are the skills required to carry out goal-directed behaviors. These skills include attentional control, cognitive flexibility/working memory, processing speed, and goal setting (Anderson et al., 2010). Even a concussion (a type of mild TBI) can cause difficulties with theory of mind, or understanding the perspective of others (Bellerose, Bernier,
Beautoin, Gravel, Beauchamp, 2015). Severe TBI in early childhood can also cause deficits in school readiness skills (Taylor et al., 2008).

Beyond executive functioning and cognitive deficits, TBIs sustained early in life can also cause behavioral impairments (Anderson et al., 2009). TBI is associated with increased risk for anxiety, Attention Deficit Hyperactivity Disorder (ADHD), and Oppositional Defiant Disorder (ODD; Krayer et al., 2012; McKinlay, Grace, Horwood, Fergusson, & MacFarlane, 2010). Additionally, the severity of TBI is associated with the severity of behavioral deficits, specifically in preschool students (McKinlay, Grace, Horwood, Fergusson, & MacFarlane, 2010). Besides severity of injury, fewer family resources are a predictor of more executive deficits (Potter et al., 2011). Likewise, environmental disadvantage amplifies the effects of TBI on some tests, like Naming Vocabulary, part of the Differential Abilities Scale (Elliott, 2007), which requires test-takers to name objects and pictures (Taylor et al., 2008). The impact of preschool TBI can be extensive and thus additional research is warranted.

**Head Start Population**

Because environmental disadvantage and lack of family resources are associated with more adverse effects from TBI (Potter et al., 2011; Taylor et al., 2008), it is necessary to examine these factors more closely. Head Start is an early learning program for low-income families. Head Start services children aged three to five while Early Head Start provides assistance to pregnant women, infants, and toddlers. Some of the comprehensive services provided by Head Start include early learning, health and safety, nutrition, social and emotional development, and transition services. Local Head Start
programs determine eligibility requirements for attendance, but in general, Head Start services families at or below the poverty level (Office of Head Start, 2016).

As previously discussed, adverse effects from TBI are associated with low-income populations. However, researchers have also examined the occurrence of bodily injury in the Head Start population. Whiteside-Mansell et al. (2010) screened families from Head Start centers and found that many Head Start children are at risk for potential long-term bodily harm. The researchers examined the following areas when looking at risk for harm: home and car safety (including vehicle safety, secondhand smoke, fire safety, poison accessibility, dangerous objects in home, and observations of safety), surveillance, personal safety (including neighborhood and violence exposure), cohesion/conflict (including parenting stress, conflict with co-parent, family conflict, and family cohesion), and parental depression. Many of the factors contributing to risk pertain directly to the parents of the preschoolers rather than the environment or the preschoolers themselves. Such examples include rates of parental depression, parental or family conflict, and parental monitoring. Other factors that do not pertain directly to parents can often be controlled by the parents, such as the use of car seats and safety belts, fire safety mechanisms, or poison accessibility. All of these factors are related to the child’s risk for bodily injury. These findings clearly point to a need for injury prevention efforts that target parents.

**Interventions Targeting Injury**

Children in Head Start programs are at risk for unintentional injuries (Whiteside-Mansell et al., 2010), and their parents can be engaged in discussion about these risks. Hatfield et al. (2006) found through parent surveys and home visits that Head Start
parents are generally reliable in reporting their at-home safety factors. Additionally, they are more likely to report problems with home safety if they believe they’ll receive assistance for those problems.

Parental willingness to discuss at-home practices for safety is seen in other studies as well. Carrillo Zuniga et al. (2012) examined the effectiveness of an educational intervention for Head Start parents about asthma. The intervention consisted of an asthma and health homes curriculum in the form of a one-time PowerPoint presentation. The study found positive results for parent participants; specifically, the program led to environmental changes (e.g., opening windows, cleaning the house more frequently, throwing out trash, etc.) in participants’ households. This strategy for change (educational presentations) could be carried over into injury prevention.

When looking to change behavior in certain populations, discussion alone may not be enough. Training programs that have a specific focus and teach a set of skills provide a deeper level of knowledge on a particular subject. Furthermore, utilizing role-play can increase the confidence of participants in performing desired tasks. For example, Lewis et al. (2013) employed role-play to increase the confidence of nursing students in their communication skills.

Researchers have evaluated training programs that teach injury-prevention practices. Morrongiello and Kane (2015) demonstrated positive change in faulty beliefs about injury known to predict children’s risk practices on the playground. Some of these beliefs that predict risky behavior include: appraisal of vulnerability, severity, preventability, and balance of costs to benefits. For example, a child might have a faulty belief about their vulnerability and think “How likely am I to experience a negative
outcome if I do this risky behavior?” An underestimation of his vulnerability will lead the child to engage in the risky behavior. This study, however, targeted children ages 7 to 12 years old. When addressing injury, and specifically TBI, in preschoolers, targeting the children could be helpful. However, no studies were found in which intervention efforts addressed the preschoolers directly. Instead, studies examined the complex and multifaceted environmental factors that contribute to preschool injury (Andrade, Cordovil, & Barreiros, 2013; Reading, Jones, Haynes, Daras, & Edmond, 2008; Simpson, Turnbull, Ardagh, & Richardson, 2009). These studies lead to the conclusion that addressing the role of parents in this problem is crucial.

**Purpose for the Present Study**

Addressing the role of parents in preschool TBI is critical. The current research is lacking in studies that examine the efficacy of training programs aimed at increasing parent awareness, knowledge, and confidence in preventing, identifying, and responding to preschool TBI. Because of the heightened risk for injury in children who attend Head Start programs, parents of Head Start students were targeted to reduce this risk for injury.

The purpose for the present study was to address a gap in the research by examining the effectiveness of such training programs. The research points to a need for further exploration given the risk for injury and TBI in preschoolers, the harmful effects of TBI in preschoolers, and the important role that parents play in determining their children’s risk level for injury. The primary researcher conducted training sessions with parents of preschoolers about preschool injury and TBI. Consistent with methods used in examined studies, the training utilized discussion, role-playing, and direct instruction.
CHAPTER III
METHOD

The present study was carried out to evaluate a training program for parents of Head Start students focused on TBI prevention and response.

Research Questions and Predictions

The following questions were posed for the current study:

Research question #1. How does a scenario-based training program affect Head Start parents’ awareness, knowledge, and confidence about TBI prevention and response?

Prediction #1. It was predicted that the scenario-based training program will increase Head Start parent awareness, knowledge, and confidence about TBI prevention and response. This hypothesis was based on research that found educational interventions can create change in at-home safety practices in Head Start parents (Carrillo Zuniga et al., 2012).

Research question #2. What demographic factors (i.e., number of children, age, marital status, ethnicity, level of education) are associated with parent knowledge prior to training?

Prediction #2. It was predicted that single non-white parents, with more children and less education would demonstrate poor knowledge about TBI prevention and response prior to training. This hypothesis was based on research demonstrating that certain risk factors are associated with an increased risk for injury (Reading, Jones,
Haynes, Daras, & Edmond, 2008) and more severe deficits following a TBI in preschoolers (Potter et al., 2011; Andrade, Cordovil, & Barreiros, 2013). These risk factors include having non-white mothers, being at an economic disadvantage, and having four or more persons in the house; more injuries reported by mothers with higher levels of education were linked to a higher likelihood of reporting rather than an increased risk for injury (Reading, Jones, Haynes, Daras, & Edmond, 2008).

**Research Design**

This study utilized a single-group pretest/posttest design (Mertens, 2010) and produced quantitative data. Results were compared across participants. The independent variable was the parent training program and the dependent variable was the parents’ awareness, knowledge, and confidence about TBI prevention and response.

**Participants and Setting**

Convenience sampling (Mertens, 2010) was used to recruit participants for the present study. Participants in the current study included \((n = 40)\) parents of preschool children. Thirty-two of these parents were recruited through a partnership with Miami Valley Child Development Centers (MVCDC), which offers Head Start programs in Montgomery, Clark, and Madison counties in the state of Ohio. This type of sampling was selected because of MVCDC’s willingness to partner and provide participants. Data were collected before and after each of the five parent training sessions that were offered as a part of parent education events hosted by MVCDC. Because parent participation was low at MVCDC sites, two additional training sessions were held at non-MVCDC sites in order to recruit the remaining eight participants. Forty parents were trained overall, but because three parents did not answer all pre- and post-test questions, only the responses
of thirty-seven parents who answered all questions were analyzed for Research Question 1. No questions were asked about socio-economic status because the original intent was to use all Head Start parents, assuming that the Head Start participants would all meet the low-income requirements for Head Start.
Table 1

Participant Demographics

<table>
<thead>
<tr>
<th>Parents</th>
<th>Number</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Total</td>
<td>40</td>
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<tr>
<td>Head Start</td>
<td>32</td>
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<tr>
<td>Non-Head Start</td>
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<tr>
<td>Mean Age</td>
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| Mean number of children in household | 2.2 | --- |

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<tr>
<th>Ethnicity</th>
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<tr>
<td>Caucasian</td>
<td>24</td>
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<tr>
<td>African American</td>
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<td>22.5%</td>
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<tr>
<td>Hispanic</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>Other</td>
<td>5</td>
<td>12.5%</td>
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<th>Highest Completed Education Level</th>
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<tr>
<td>Some High School</td>
<td>2.5%</td>
</tr>
<tr>
<td>High School</td>
<td>32.5%</td>
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<tr>
<td>GED</td>
<td>2.5%</td>
</tr>
<tr>
<td>College</td>
<td>45%</td>
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<tr>
<td>Master’s</td>
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<th>Marital Status</th>
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<td>Single</td>
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<tr>
<td>Married</td>
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<tr>
<td>Divorced</td>
<td>10%</td>
</tr>
<tr>
<td>Widowed</td>
<td>0%</td>
</tr>
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</table>

Materials

Measures. A pre- and post-test (see Appendix A) was created to measure parents’ awareness, knowledge, and confidence about TBI prevention and response. The test consisted of 10 questions; three questions assessed parent awareness of TBI using a Likert scale, three questions assessed parent confidence in responding to TBI using a Likert scale, and four questions assessed parent knowledge in regards to TBI using free
response. The pre- and post-tests were identical, except for additional demographic questions on the post-test. The measure was piloted on a group of school psychology graduate students to evaluate question clarity. It was also piloted on a population similar to the sample population to evaluate question quality. Participants were also asked to complete a questionnaire answering demographic questions (e.g., ethnicity, number of children, etc.). Both measures were administered in paper and pencil format.

**Intervention materials.** Because there was no pre-existing training program aimed at Head Start parents and related to preschool TBI prevention and response, one was developed utilizing existing materials about childhood TBI prevention and response (see Appendix B). The training contained resources and data from the Center for Disease Control and Dayton Children’s Hospital. Each training session lasted approximately one hour and was delivered at five separate sessions to groups of 2-10 Head Start parents. In order to increase the number of participants, the training was then delivered across two more separate sessions to groups of 2-6 non-Head Start parents of preschoolers. The training sessions were interactive and scenario-based.

The training began with an introduction and an explanation of the purpose of the research; informed consent was obtained. Participants then completed the pre-training survey (pre-test). The trainer began the training by explaining her research on TBI as well as her own experience with TBI, encouraging the participants to share their own experiences throughout the training. The content of the training included:

- the definition of TBI
- local data concerning bike and head injuries and helmet use
- causes of TBI
• potential effects of TBI
• how to respond to TBI
• what happens when a parent takes a child to the doctor because of a suspected TBI
• TBI prevention and safety practices
• practice scenarios involving possible TBI
• how to appropriately fit a bike helmet on a child

Videos and handouts were used throughout the training to reinforce concepts and provide parent perspective. When the presentation ended, the trainer guided the participants through fitting bike helmets on their children as they practiced the skills they had just learned.

Procedures

**Phase I: IRB Approval.** Approval for the research study was obtained through the Institutional Review Board (IRB) at the University of Dayton (see Appendix C).

**Phase II: Pilot.** The pre- and post-tests were piloted with a group of ten school psychology students to obtain feedback concerning question clarity. Then, the revised tests were piloted again with twelve low-income parents of preschoolers to identify any missing parts or confusing questions, and to ensure the quality of the questions. After reviewing the results of the pilot tests, the pre- and post-tests were revised again to improve clarity.

**Phase III: Recruitment.** Recruitment of participants was conducted in conjunction with MVCDC. Parents were invited to attend the training sessions as part of a parent education event hosted by MVCDC. The training sessions were advertised at the Head Start or preschool centers using fliers provided by the researcher. Fliers were posted
weeks before the event, yet parent attendance was still low. Two centers encouraged parents to sign up for the training sessions, but no parents signed up and these sessions were cancelled. For the non-MVCDC sessions, the recruitment process was the same. All participants were asked to provide informed consent prior to the start of the training session.

**Phase IV: Pre-Test.** Baseline was established by a paper and pencil pre-test that was taken before the training began. Participants rated their awareness of TBI and confidence to respond to TBI using Likert-scale questions. They responded to scenario-based questions assessing knowledge of how to respond to TBI.

**Phase V: Training.** Participants participated in a one-hour training delivered by the researcher at the preschool centers throughout Montgomery County.

**Phase VI: Post-Test.** Post-intervention data were collected via a paper and pencil post-test administered immediately following the training. Participants were also asked to complete an attached demographic questionnaire and answer three questions to provide feedback about the training.
CHAPTER IV

RESULTS

Following are the results of delivering a training program about TBI prevention and response to parents of preschool-aged students, including an analysis of their pre- and post-test data.

Data Analyses

Research question 1. How does a scenario-based training program affect Head Start parents’ awareness, knowledge, and confidence about TBI prevention and response?

The pre- and post-test results yielded continuous scale data. The six Likert-scale questions assessing awareness of TBI and confidence to respond to TBI were assigned point values (Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; Strongly Agree = 5). The four free response questions assessing knowledge of what to do in a possible TBI situation were scored using a coding system. Responses were scored as 2 points if the participant said he or she would seek medical attention. Responses were scored as 1 point if the participant indicated that he or she recognized a problem, but postponed action (e.g., “Keep an eye on his behavior,” “See how she feels the next day,” etc.). Responses were scored as 0 points if the participant indicated that he or she
wouldn’t do anything or gave any other type of answer. Points were totaled for each domain area (awareness, confidence, and knowledge) covered on the pre- and post-test.

A paired-samples T-test was conducted to evaluate if the training program increased participants’ awareness about TBI, their confidence in responding to TBI, and their knowledge of what to do in a possible TBI situation. The results indicated that the mean post-test awareness ($M = 13.11, SD = 1.286$) was significantly greater than the mean pre-test awareness ($M = 11.08, SD = 1.286$), $t(36) = 7.45, p < .01$, as shown in Table 2 and Table 3. Additionally, the mean post-test confidence ($M = 13.62, SD = 1.441$) was significantly greater than the mean pre-test confidence ($M = 10.22, SD = 2.699$), $t(36) = 7.34, p < .01$, as shown in Table 2 and Table 3. The mean post-test knowledge ($M = 7.38, SD = 1.967$) was significantly greater than the mean pre-test knowledge ($M = 7.38, SD = 1.570$), $t(36) = 2.25, p < .05$, as shown in Table 2 and Table 3.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AwarePre</td>
<td>11.08</td>
<td>1.801</td>
</tr>
<tr>
<td>AwarePost</td>
<td>13.11</td>
<td>1.286</td>
</tr>
<tr>
<td>Confidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ConfPre</td>
<td>10.22</td>
<td>2.699</td>
</tr>
<tr>
<td>ConfPost</td>
<td>13.62</td>
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<tr>
<td>Knowledge</td>
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<td></td>
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<tr>
<td>KnowPre</td>
<td>6.49</td>
<td>1.967</td>
</tr>
<tr>
<td>KnowPost</td>
<td>7.38</td>
<td>1.570</td>
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</table>
Table 3

*Differences in Means for Pre- and Post-Tests*

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness Pre - Post</td>
<td>-2.027</td>
<td>1.658</td>
<td>.273</td>
<td>-2.580</td>
<td>-1.474</td>
<td></td>
<td>-7.436</td>
</tr>
<tr>
<td>Confidence Pre - Post</td>
<td>-3.405</td>
<td>2.823</td>
<td>.464</td>
<td>-4.347</td>
<td>-2.464</td>
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<td>-7.337</td>
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<tr>
<td>Knowledge Pre - Post</td>
<td>-.892</td>
<td>2.413</td>
<td>.397</td>
<td>-1.7696</td>
<td>.087</td>
<td></td>
<td>-2.249</td>
</tr>
</tbody>
</table>

**Research question 2.** What demographic factors (i.e., number of children, age, marital status, ethnicity, level of education) are associated with parent knowledge prior to training?

The demographic information collected via survey yielded categorical data. Parents provided information regarding the number of children living in their homes, the parents’ ages, ethnicity, level of education, and marital statuses. Parents’ pre-assessed level of knowledge in regards to preventing and responding to TBI yielded scale data based on free response answers to the four knowledge questions. The relationship between the relevant demographic characteristics and initial parent knowledge was evaluated using correlational statistics.

Correlations were run using Pearson product-moment correlations. No significant correlations were found (see Table 4). It should be noted that the sample size differs for the various demographic factors due to some respondents leaving questions blank. Two
respondents did not answer the question about age and one respondent did not answer the question about marital status.

Table 4

*Correlations between Demographic Factors and Knowledge Prior to Training*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children</strong></td>
<td>Pearson Correlation</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>Pearson Correlation</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
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</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td>Pearson Correlation</td>
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<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
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<td></td>
<td>N</td>
</tr>
<tr>
<td><strong>Marital</strong></td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

**Post-hoc analysis.** A post-hoc analysis was conducted to determine if any significant difference existed between the growth in confidence and the awareness of Head Start parents compared to non-Head Start parents. Because four participants did not have valid knowledge growth scores due to missing questions, the analysis could not be conducted for the knowledge domain. A Mann-Whitney *U* test was conducted to see if Head-Start parents showed more growth than non-Head Start parents on the awareness or confidence domains. Instead, the results of the test showed that non-Head Start parents reported more growth in the both the awareness and confidence domains, but neither difference was significant. Because three participants left questions blank for the
awareness and confidence domains, the sample size is 37 Head Start and non-Head Start parents. For the awareness domain, the mean ranks of Head Start (n = 29) and non-Head Start (n = 8) parents were 18.1 and 22.3 respectively, $U = 89.5, z = -0.993, p > 0.5$. For the confidence domain, the mean ranks of Head Start (n = 29) and non-Head Start (n = 8) parents were 17.4 and 24.8 respectively, $U = 69.5, z = -1.729, p > 0.5$. 
CHAPTER V
DISCUSSION

Review of Purpose and Major Findings

Preschool-aged children from low socioeconomic status families are at an increased risk for injury; one such injury is TBI (Anderson et al., 2010; Simpson, Turnbull, Ardagh, & Richardson, 2009). Children who sustain TBI can experience long-lasting effects such as impairment in executive functioning, school readiness deficits, or behavioral impairments (Anderson et al., 2009; Anderson et al., 2010; Taylor et al., 2008). Additionally, environmental disadvantage and fewer family resources are associated with more adverse effects following TBI (Potter et al., 2011; Taylor et al., 2008). Therefore, educating parents about these risk factors is critical. Researchers have evaluated training programs to teach injury-prevention practices with success in the past (Morrongiello & Kane, 2015). Intervening at the parent level is the most logical method for impacting change in preschool injury rates.

The purpose of this study was to address a gap in the literature through development and evaluation of a training program for parents of preschoolers. The goal of the training program was to increase the preschool parents’ awareness of TBI, confidence to respond to TBI, and knowledge of what to do in a situation involving TBI.
Interpretation of Findings Relative to Predictions

Effectiveness of training. As hypothesized, parents showed an increase in awareness of TBI, confidence to respond to TBI, and knowledge of what to do in a possible TBI situation after participating in the training session. The increase was statistically significant for the awareness, confidence, and knowledge domains.

The significant increase in awareness about TBI demonstrates that parents who participated in the training became more aware of what TBI is, what can cause it and the prevalence of TBI in the media. They also increased in their awareness of what they would do if their child(ren) sustained TBIs. For example, parents more strongly agreed with the statement that they had thought about what they would do if their child sustained a TBI after the training than before the training.

The significant increase in confidence to respond to TBI indicates that parents who participated in the training felt more prepared to respond to a TBI than they did prior to the training. These findings support the use of a parent training to increase awareness and confidence surrounding the topic of preschool TBI. For example, parents more strongly agreed with the statement that they would know what to do if their child sustained a TBI after the training than before the training.

The significant increase in knowledge of what to do following a possible TBI situation indicates that parents who participated in the training knew specific signs and symptoms to look for that may indicate a TBI in an injury situation. Additionally, their knowledge increased in regards to when their child should wear a helmet. For example, parents were more likely to correctly identify when their child should wear a helmet or indicate that they would seek immediate medical attention if their child was injured and
displayed symptoms of a TBI (e.g., change in sleep patterns, change in motor coordination, etc.)

**Demographic correlations.** It was predicted that single non-white parents, with more children and less education would demonstrate poorer knowledge about TBI prevention and response prior to training. Results indicated that no significant correlations existed between the selected demographic factors and knowledge prior to the training. While other research has shown non-white mothers and more persons in the house as risk factors associated with an increased risk for injury (Reading, Jones, Haynes, Daras, & Edmond, 2008) and more severe deficits following a TBI in preschoolers (Potter et al., 2011; Andrade, Cordovil, & Barreiros, 2013), this study did not support the demographic factors of age, number of children, level of education, marital status, or ethnicity to be significantly correlated with knowledge of what to do in a possible TBI situation. These findings may support utilizing parent training for a wide range of parents, as the results did not show one type of parent to have lower knowledge than another. However, it should be noted that the sample of Head Start and non-Head Start parents was not equally representative, which may have impacted the outcome.

**Limitations**

There were several limitations to this research study. First, because the training sessions were given across seven different sessions, it cannot be guaranteed that the training was the exact same every time. Because parents were encouraged to participate and share their own experiences, some sessions involved more discussion than others, depending on the parents in attendance. Second, while the knowledge domain was a free response with coded answer scoring, the awareness and confidence domains were
measured using self-report Likert-scales. Participants could have reported more growth than they actually experienced. Additionally, while the goal of the training was to reach low-income parents of preschool students, no questions were asked about socio-economic status. Instead, the assumption was made that all participants had low-income levels because of their involvement in the Head Start setting. Last, because the sample was a convenience sample of parents who were willing to attend the training, the sample may not have been representative of the population as a whole, as parents who attended the training sessions may have been more open to learning new skills or interested in the topic than the general population.

**Implications for Future Research**

This study aimed to fill the gap in research concerning trainings about TBI for parents of preschoolers. Future research should utilize a larger sample size that is more diverse in terms of age, ethnicity, education level, income status, marital status, and number of children, as these factors have been relevant in other studies (Potter et al., 2011; Taylor et al., 2008). Additionally, future research should seek alternative delivery formats of training, such as online, in order to reach more participants. Follow up with participants to see if the training had any impact on real-life TBI situations would be beneficial as well.

**Conclusion**

The present study examined the efficacy of a TBI prevention and response parent training program. The findings indicate that the training program effectively increased parents’ awareness of TBI, confidence to respond to TBI, and knowledge of what to do in a possible TBI situation. Such studies are needed to help close the gap in the existing
current literature addressing the efficacy of targeting parents of preschoolers in TBI prevention and response.
REFERENCES


493. doi:10.1017/S1355617715000569


APPENDIX A

MEASURES

Pre-Training Survey
*Please answer the following questions as best as you can.*

1. I have a good understanding of what a traumatic brain injury is.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
2. I have seen people talking about traumatic brain injury in the media (e.g., television, newspaper, social media).
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
3. I have thought about what I would do if my child had a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
4. I am confident that I know what steps to take to try to prevent my child from having a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
5. I am confident that I would *know* if my child experienced a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
6. I am confident that I would *know what to do* if my child experienced a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
7. Your child is climbing on the kitchen counter one afternoon, falls, and hits her head. She seems okay, but the next morning, she sleeps until 10 am, when she usually gets up at 7 am. When you go into her room to wake her up, she is unusually sluggish and slow to get moving. What should you do?
8. Your child is playing tag in the house and runs into a wall. He doesn't hit his head, but afterwards he's not acting like himself and complains of a stomachache. What should you do?
9. Your child falls from the monkey bars on the playground and hits her head. She doesn't lose consciousness, but just appears stunned. A little later, you see her struggling to keep her balance. What should you do?
10. When should your child wear a helmet?
Post-Training Survey

Please answer the following questions as best as you can.

1. I have a good understanding of what a traumatic brain injury is.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

2. I have seen people talking about traumatic brain injury in the media (e.g.,
television, newspaper, social media).
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

3. I have thought about what I would do if my child had a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

4. I am confident that I know what steps to take to try to prevent my child from
   having a traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

5. I am confident that I would know if my child experienced a traumatic brain
   injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

6. I am confident that I would know what to do if my child experienced a
   traumatic brain injury.
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

7. Your child is climbing on the kitchen counter one afternoon, falls, and hits her
   head. She seems okay, but the next morning, she sleeps until 10 am, when she
   usually gets up at 7 am. When you go into her room to wake her up, she is
   unusually sluggish and slow to get moving. What should you do?

8. Your child is playing tag in the house and runs into a wall. He doesn’t hit his
   head, but afterwards he’s not acting like himself and complains of a
   stomachache. What should you do?

9. Your child falls from the monkey bars on the playground and hits her head.
   She doesn’t lose consciousness, but just appears stunned. A little later, you see
   her struggling to keep her balance. What should you do?

10. When should your child wear a helmet?
Please answer the following demographic questions. All responses are confidential.

1. How many children are living in your home? ________
2. How old are you? ________
3. What is your ethnicity?
   a. Caucasian
   b. African American
   c. Hispanic
   d. Other ________
4. What is your highest completed level of education?
   a. Some high school
   b. High School
   c. GED
   d. College
   e. Masters
5. What is your marital status?
   a. Single
   b. Married
   c. Divorced
   d. Widowed
6. Overall, this training was
   Not at all helpful    Not very helpful    Neutral    Helpful    Very Helpful
7. This training was a good use of my time
   Strongly disagree    Disagree    Neutral    Agree    Strongly Agree
8. What is one way the training could be changed to make it better?
Welcome

- Introduction
- Pre-training Survey
- Why I’m here
- Training
- Post-training Survey
Pre-Training Survey
I’m a graduate student at the University of Dayton studying school psychology. As a part of my training, I’m conducting this research project to help educate parents of preschoolers about traumatic brain injury (TBI). The reason I’m talking specifically to parents of preschoolers is that preschoolers are at a high risk for injury. Their little bodies are going through a lot of change as their brains are growing rapidly and their motor skills are developing. They’re often curious and exploratory, which can lead to falls. While bumps and scrapes can hurt, a very serious possible injury is TBI. We’ll talk more about what TBI is in a little bit.

You may think that something called a “traumatic brain injury” is so serious that it could never happen to your child, but in fact almost a half a million kids are treated in emergency departments for TBI each year. My own experience with TBI goes beyond simply researching it as well. When I was 6 years old, I had a concussion, which is a mild TBI. My older brother was bent down playing music on a stereo, and I climbed on his back. He stood up, and I fell off, hitting the back of my head on the concrete floor. My mom came over to check on me along with another mom there who was a nurse. I was crying and looking at them; I hadn’t lost consciousness. The nurse was checking my pupils and they weren’t sure if they should take me to the ED or not but my mom felt like I wasn’t acting myself – I had a blank glazed look. Didn’t have any swelling outside or
any external signs. It was all internal. She tried to not let me go to sleep in the car (wives’
tale). I wasn’t crying on the way down. I felt nauseous. I threw up in the waiting room.
One clue was that I was always compliant, but I was screaming and crying and wouldn’t
even let them look in my ears or when they took me for a CT scan. The scan showed that
I had had a slight concussion. Told them to let me rest and keep an eye on me. They’d
wake me up every couple of hours to check on me. I didn’t have any recollection of it. At
one point at the doctor’s, after CT scan, I looked up and wanted to know where we were.
Mom kept me home from school the next day as a precaution. I had headaches some
afterward. Other than that, no residual effects thankfully.
First ask if any of them know what traumatic brain injury is
It’s important to note that a child doesn’t necessarily have to hit his head to experience a TBI. He could be hit in the body hard enough that his brain moves inside his head, causing a concussion. A disruption of normal brain function is the key part.

Note: Next slide is a video.
What Can Cause TBI?

- Falls (account for 50%)
- Car accidents
- Bike/scooter accidents
- Can you think of others?

Other possible answers: a baby being shaken, something penetrating the brain (e.g., bullet), sports
Explain what executive functioning is – the ability to attend to multiple tasks, make decisions, be organized

Myth of plasticity: Many think that if a child has a brain injury, she’ll simply “bounce back” because her brain is still developing. However, a brain injury during development can often disrupt crucial development instead. TBI is serious at every age.
Emphasize that I’m not a parent, so there are going to be things that I don’t know. It would be great if we could learn from each other’s experiences.
So what if your child does experience a TBI? What do you do?

Signs and Symptoms:

**SIGNS OBSERVED BY PARENTS OR GUARDIANS**
- Appears dazed or stunned
- Is confused about events
- Answers questions slowly
- Repeats questions
- Can’t recall events *prior* to the hit, bump, or fall
- Can’t recall events *after* the hit, bump, or fall
- Loses consciousness (even briefly)
- Shows behavior or personality changes
- Forgets class schedule or assignments

**SYMPTOMS REPORTED BY YOUR CHILD OR TEEN**
Thinking/Remembering:
- Difficulty thinking clearly
- Difficulty concentrating or remembering
- Feeling more slowed down
- Feeling sluggish, hazy, foggy, or groggy

Physical:
• Headache or “pressure” in head
• Nausea or vomiting
• Balance problems or dizziness
• Fatigue or feeling tired
• Blurry or double vision
• Sensitivity to light or noise
• Numbness or tingling
• Does not “feel right”

Emotional:
• Irritable
• Sad
• More emotional than usual
• Nervous

Sleep*:
• Drowsy
• Sleeps less than usual
• Sleeps more than usual
• Has trouble falling asleep

Be alert for symptoms that worsen over time. Your child or teen should be seen in an emergency department right away if s/he has:
• One pupil (the black part in the middle of the eye) larger than the other
• Drowsiness or cannot be awakened
• A headache that gets worse and does not go away
• Weakness, numbness, or decreased coordination
• Repeated vomiting or nausea
• Slurred speech
• Convulsions or seizures
• Difficulty recognizing people or places
• Increasing confusion, restlessness, or agitation
• Unusual behavior
• Loss of consciousness (even a brief loss of consciousness should be taken seriously)

If you determine that your child needs medical attention, take them to their doctor or to the emergency department

What to tell the doctor:

Cause of the injury
• Any loss of consciousness (passed out/knocked out) and if so, for how long
• Any memory loss right after the injury
• Any seizures right after the injury
• Number of previous concussions (if any)

Your child or teen’s medical provider may do a scan of his or her brain (such as a CT scan) to look for signs of a more serious brain injury. Other tests such as "neuropsychological" or "neurocognitive" tests may also be performed. These tests help assess your child or teen’s learning and memory skills, the ability to pay attention or concentrate, and how quickly he or she can think and solve problems. These tests can help the child’s medical provider identify the effects of the concussion.
Get Written Concussion Care Instructions
Ask for written instructions from the young athlete’s health care provider on return to play. These instructions should include information about when they can return to play and what steps you should take to help them safely return to play. Before returning to play an athlete should:
Be back to doing their regular school activities.
Not have any symptoms from the injury when doing normal activities.
Have the green-light from their health care provider to begin the return to play process.
Preventing TBI

Note: Next slide is a video.
So how can we prevent our children from sustaining a TBI in the first place?
Car seat: your preschool child should be in a booster seat until they’re big enough that the seat belt fits properly
Helmet use when:
- Riding a bike, motorcycle, snowmobile, scooter, or all-terrain vehicle;
- Playing a contact sport, such as football, ice hockey, or boxing;
- Using in-line skates or riding a skateboard;
- Batting and running bases in baseball or softball;
- Riding a horse; or
- Skiing or snowboarding.

Note: Next slide is a video.
Practice Scenarios
Your child is riding her scooter one morning without a helmet. She falls, and bumps her head. She seems okay, but you decide to put her down for a nap. She normally naps for about an hour, but when you check on her after 2.5 hours, she’s still sound asleep. What should you do?
Your child is playing soccer outside and runs into a fence. He doesn’t hit his head, but afterwards he’s not acting like himself and complains of a stomachache. What should you do?
Your child falls from her brother’s top bunk and hits her head on the floor. She doesn’t get knocked out, but just appears stunned. You decide to just keep an eye on her. A little later, you see her struggling to keep her balance. What should you do?
Look at handout
Size – measure head with soft measuring tape
Fit-
  • Ask how it feels on your child’s head – want it snug, but too tight can cause headaches
  • Make sure your child has the hairstyle he or she will have when using the helmet
  • You can adjust some helmets by removing padding or using universal fit rings
  • The bottom pad inside the front of the helmet should be one or two finger widths above the child’s eyebrows. The back of the helmet should not touch the top of their neck.
  • Make sure they can see clearly forward and side to side
  • Side straps should make a V shape under and slightly in front of ears
  • When chin strap is buckled, no more than 2 fingers should be able to get in there. Have the child open her mouth wide – the helmet should pull down on her head.
  • The helmet should not move in any direction – front to back or side to side
The HEADS UP app is free in the app store. It has basic information about concussions, the signs and symptoms of a concussion, tips for fitting your child’s helmet, and more!
Special Thanks

- MVCDC
- University of Dayton
- Child Injury Action Group
References


Post-Training Survey
Have children come in and practice helmet fitting
INVITATION TO PARTICIPATE IN RESEARCH

Surveys and Interviews

Research Project Title: Effectiveness of Preschool Parent Training for TBI Prevention and Response

You have been asked to participate in a research project conducted by Allie Hundley from the University of Dayton, in the Department of Counselor Education.

The purpose of the project is: To determine if a parent training program can increase Head Start parents’ awareness, knowledge, and confidence in preventing and responding to preschool traumatic brain injury.

You should read the information below, and ask questions about anything you do not understand, before deciding whether or not to participate.

• Your participation in this research is voluntary. You have the right not to answer any question and to stop participating at any time for any reason. Answering the questions will take about 10 minutes.

• You will not be compensated for your participation.

• All of the information you tell us will be confidential.

• If this is a recorded interview, only the researcher and faculty advisor will have access to the recording and it will be kept in a secure place.

• If this is a written or online survey, only the researcher and faculty advisor will have access to your responses. If you are participating in an online survey: We will not collect identifying information, but we cannot guarantee the security of the computer you use or the security of data transfer between that computer and our data collection point. We urge you to consider this carefully when responding to these questions.
• I understand that I am ONLY eligible to participate if I am over the age of 18.

Please contact the following investigators with any questions or concerns:

Allie Hundley, hundleya2@udayton.edu, (740) 359-7853

Dr. Susan Davies, sdavies1@udayton.edu, (937) 229-3652

If you feel you have been treated unfairly, or you have questions regarding your rights as a research participant, you may contact Candise Powell, J.D., Chair of the Institutional Review Board at the University of Dayton, IRB@udayton.edu; Phone: (937) 229-3515.