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A Preliminary Analysis of the Relationship between Hazards in the Home and the Potential for Abuse with Families At-Risk

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by

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ABSTRACT

Child maltreatment (CM) and unintentional childhood injury affects millions of children and cost society billions of dollars annually. The population at risk for CM has congruent demographic characteristics as children that are more likely to have unintentional injuries. Preventing CM through evidence-based home-visiting programs has been shown effective and cost efficient, and the inclusion of home safety in such programs, demonstrates significant reduction of hazards in the home. The overarching goal of the current research is to make a statistical connection between the population at risk for CM and amount of hazards in the home; that these two populations have enough overlap to validate the inclusion of home safety components in CM prevention programs. This study uses data from an ongoing research project that braids two evidence-based parenting programs: SafeCare® and Parents as Teachers. Findings indicate that the correlation between potential for abuse, measured by BCAP scores, and hazards in the home, measured by the HAPI, show a significant correlation $r = .23$, $p < .05$. Other variables such as loneliness, distress, and marital status were also found to contribute to this relationship.

Keywords: child maltreatment, neglect, home safety, evidence-based programs, unintentional injury

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INTRODUCTION

Child maltreatment (CM) encompasses physical, emotional, and sexual abuse, as well as neglect (Department of Human and Health Services [DHHS], 2013). Physical abuse, the intentional injury to a child either directly by an individual (an act of commission) or the failure to protect the child from harm (omission), accounted for 18.3 percent of CM cases in 2012 (Giovannoni & Becerra, 1979; Mennen, Kim, Sang, & Trickett, 2010; DHHS, 2013). Neglect, the habitual failure to provide a child with basic needs either physically, medically, educationally, or emotionally (Wolfe, 1999), accounted for 78.3 percent of cases in 2012 (DHHS, 2013). Although neglect may be less visible than acute manifestations of physical abuse, such as bruising, neglect is more common, and the adverse sequelae of neglect are as severe as abuse (Dube, Anda, Felitti, Edwards, & Williamson, 2002).

CM is difficult to measure due to varying definitions and is reliant on reporting from mandated reporters and professionals. Definitions vary among legal, clinical, and research settings and nuances may vary from professional-to-professional (Runyan, Cox, Dubowitz, Newton, Upadhyaya, Kotch, & Knight, 2005). Agreement on the identification of actions or behaviors that constitute physical abuse is high compared to the low level of consensus related to neglectful actions or omissions (Bensley, Ruggles, Simmons, Harris, Williams, Putvin, & Allen, 2004). Two national data systems exist to document the incidence and prevalence of CM: (1) the National Child Abuse and Neglect Data System (NCANDS) utilizes annual records of all reported cases of CM to child protective service agencies; and, (2) the National Incidence Study (NIS), periodically mandated by Congress, uses reports from sentinels, that is adults who have regular contact with children, to evaluate CM. The NIS collects information from police reports and courts, as well as schools, hospitals, and other social service agencies. A contracted research

company collects and analyzes data using a nationally representative sample (Sedlak, Mettenburg, Basena, Petta, McPherson, Green, & Lee, 2010). The Department of Human and Health Services (DHHS) creates annual reports utilizing the NCANDS to quantify the prevalence in the United States (U.S.). While the NCANDS only uses data from CPS reporting, the NIS is designed to broadly estimate prevalence of CM. Therefore it is likely that the estimates of CM are underestimated and that the true prevalence of CM falls in between the estimates of both national reports (Sedlak et al., 2010).

Given the nearly 3.8 million referrals received by Child Protective Services in 2012 alone, the U.S. DHHS considers CM a high public health priority. While CM has declined by 34 percent overall according to statistics over the past 20-years, until 2012 when there was a slight rise, child neglect has been relatively stable and currently accounts for over 75 percent of CM cases (DHHS, 2013; Finkelhor, & Jones, 2012; Leroy, 2013). It is estimated that 6.3 million children were included in the 3.8 million referrals made for CM from which over 686,000 cases were substantiated. Of these cases, physical abuse accounted for 18.3 percent whereas neglect accounted for 78.3 percent (DHHS, 2013). Considering acts of neglect are more difficult to identify, only half of children's deaths attributable to neglect are recorded as such, implying that deaths due to neglect are usually an underestimate (Crume, DiGuiseppi, Byers, Sirotnak, & Garrett, 2002). Children birth through one-year-old experience the highest rate of CM, 21.9 victims per 1,000 children in 2012 (DHHS, 2013). Victimization rates between males and females were similar, 48.7 percent and 50.9 percent, respectively. White children have the highest rate of victimizations at 44 percent of maltreatment cases, followed by Hispanic children at 21.8 percent of cases, and African American children at 21 percent of cases in 2012 (DHHS, 2013). In 2012, deaths attributable to maltreatment were 1,640 children, equivalent to a rate of

2.2 deaths per 100,000 children (DHHS, 2013). The demographic information of nonfatal maltreatment versus fatal maltreatment is similar with exception of gender where death rates for maltreated boys was 2.54 boys per 100,000 boys and girls was 1.94 for girls per 100,000 girls (DHHS, 2013).

Risk Factors for CM

The contributing factors for CM are complex; there is no identifiable single cause. A social-ecological perspective highlights the broader individual and social dysfunction that may set the occasion for instances maltreatment. Risk factors with the highest correlation to substantiated child maltreatment reports were found in parents that perceived the child as a 'problem'; had a high level of anger, anxiety, and stress; and low levels of self-esteem and social support (Stith, Liu, Davies, Boykin, Alder, Harris, Som, McPherson, & Dees, 2009). Events or situations that increase stress are usually found to contribute to the risk for child maltreatment.

Other risk factors found in parents with a higher incidence of CM have been well established: younger mothers and mother's lower education level, low socioeconomic status, low income, employment status, drug or alcohol abuse, history of domestic violence, and family structure (Putnam-Hornstein, Needell, & Rhodes, 2013; Sedlak et al., 2010; Douglas, 2013). Alcohol abuse, maternal depression, and age of mother at delivery were found to highly correlate to CM and to the reoccurrence of CM, with the highest correlating risk factor being victim's age (Laslett, Room, Dietze, & Ferris, 2012; Windham, Rosenberg, Fuddy, McFarlane, Sia, & Duggan, 2004). Parent employment status, which relates to income level and may relate to education level, has a significant relationship to child maltreatment. Parents who were unemployed had a two times higher rate of abusing and three times higher rate of neglecting their children than employed parents (Sedlak et al., 2010.) NIS-3 reported that families with an

income less than $15,000 per year had incidence rates 22 times higher for abuse and 25 times higher for neglect compared to families whose income was greater than $30,000 per year; NIS-4 reported similar results (Sedlak & Broadhurst, 1996). Children in families in which there is only one caretaker were 77 percent more likely to be physically abused and 87 percent more likely to be neglected than families with two parents (Sedlak & Broadhurst, 1996). However, families in which there are two caretakers in an unstable relationship or that have a higher number of dependent children were found to have higher rates of maltreatment (Sedlak et al., 2010; Murry, Baker, & Lewin, 2000). Identifying these factors that relate to CM allows researchers to identify potential for abuse and create more successful prevention programs by targeting known risk factors (Putnam-Hornstein, Needell, & Rhodes, 2013).

Sequelae of CM

The adverse consequences of CM impact all aspects of life, including physical and emotional health as well as social and economic wellbeing, and continue well after the maltreatment ends (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & Marks, 1998; Hussey, Chang, & Kotch, 2006). CM is known to be a risk factor for a number of poor physical health consequences in adulthood including: lung disease, heart disease, hernias, ulcers, kidney and liver disease, as well as neurological disorders (Min, Minnes, Kim, & Singer, 2013). Increased levels of anxiety and depression in the mother were found to be significantly higher among those who reported having been victims of childhood abuse (Goodwin & Stein 2004). The emotional consequences of CM result in lower levels of social support, self-esteem, and closeness with spouses or children as an adult (Sperry & Widom, 2013; Savla et al., 2013). Additionally, teens or adults who have a history of CM are at increased risk for behavioral problems involving violence and criminal acts (Fang & Corso, 2007). Nearly 27 percent of

juveniles with a history of CM were arrested compared to 17 percent of juveniles without a history of CM (Widom & Maxfield, 2001). Self-inflicted injury rates, including suicide attempts, were twice as high for individuals who experienced CM (Rhodes, Boyle, Bethall, Wekerle, Tonmyr, Goodman, Leslie, Lam, & Manion, 2013). Adults who were abused as children were more likely to demonstrate the risk factors for CM when they became parents, such as low income and higher levels of stress, an indication of the cyclical nature of this phenomenon (Choy, Spencer-Chun, Watanabe, & Derosier, 2010).

Cost of CM

The burden for nonfatal CM victims is usually categorized into short- and long-term costs, direct (immediate) and indirect (long-term). Immediate health care costs include public and private child welfare services accounting for short-term cost. These direct costs average a total of $32,648 per victim of nonfatal CM in the U.S. Long-term costs arise from medical costs, child welfare costs, and special education (Fang, Brown, Florence, & Mercy, 2012). Indirect costs can be seen in productivity loss resulting from poor mental or physical health and lower academic achievement. The long-term health consequences make annual medical costs for victims 36 percent higher than people who have no history of CM (Bonomi, Anderson, Rivara, Cannon, Fishman, Carrell, Reid, & Thompson, 2008). Not only do victims of CM have higher medical costs, but they also have an earning gap of $5,890 per year (Grosse, 2003).

The estimated average lifetime cost of a nonfatal case of CM is $210,012 per victim (Fang, Brown, Florence, & Mercy, 2012). Using these estimates along with the cases of substantiated CM from 2008, the lifetime cost of nonfatal child maltreatment for the victims totals $121.6 billion dollars, calculated based on U.S. costs (Fang et al., 2012). The cost of child maltreatment where the result is fatal is calculated based on medical costs and lost productivity

per case is $14,100 and $1,258,812, respectively (Fang et al., 2012). Not all of the consequences, such as the emotional toll CM causes, can be estimated in dollar amounts; however, what can be estimated is enough to make the claim that preventative services in the early years the most beneficial and cost effective to society and to the individual (The Pew Center on the States, 2011).

Home Environment

Childhood injuries can often be a function of CM, especially child neglect. Unkempt living conditions, hazards in the home, and improper child supervision can all be considered child neglect and may lead to unintentional injury (Azar & Weinzierl, 2005). In the U.S., unintentional injuries account for 32.5 percent of deaths in children between birth and four-years-of-age, making it the leading cause of death for that age group (Borse, Gilchrist, Dellinger, Rudd, Ballesteros, & Sleet, 2008). Each year 9.2 million children are admitted to emergency room departments with nonfatal unintentional injuries (Borse et al., 2008). With an estimated cost of $300 billion annually, the majority of these injuries occur in or around the child's home (Borse et al., 2008). For this age group, the most common fatal injuries were suffocation and drowning, 78 percent of which occurred in the home, and males were found to have two times the death rate by injury than females (Borse et al., 2008; Brenner, Trumble, Smith, Kessler, & Overpeck, 2001). Rates of nonfatal injuries including being struck by or against an object, animal or insect bites, falls, suffocation, fire, burns, and drowning were highest in children up to four-years of age (Borse et al., 2008).

Unintentional injury is the leading cause of death in children under four-years-old (Borse et al., 2008), thus, it is reasonable to explore the link between families at risk for child maltreatment and hazards in the home.

Traditionally, childhood injury has been analyzed using epidemiologic methods, assessing individual environmental factors rather than examining person-based-risk factors as is more commonly done with CM (Sleet, Liller, White, & Hopkins, 2004). The demographics of children at risk for unintentional injury mirror that of children who have a higher potential of experiencing CM. Children in low socioeconomic conditions as it relates to family structure, drug abuse, and poorer housing conditions have an increased risk for both CM and child injury. Lower SES, is associated with more hazards in the home resulting from fewer child safety devices, such as baby gates, than children from a higher SES and are more likely to experience unintentional injury than families from higher SEC (Pearce, Li, Abbas, Ferguson, Graham, & Law, 2012). Another shared risk factor for injury and CM is the age of the child; children are most susceptible to CM and injury at zero through four-years-old. Other demographic characteristics of families that experience significantly higher rates of preventable childhood injury include one parent families, families with more children in the home, parent's education, and family income (Shi, Yang, Huang, Zhou, Zhou, & Chu, 2011). An unsafe home environment is considered neglectful where there is a high potential for accidents, a decrease in cleanliness of the child, and an increase risk from illness due to home environment (Mandel, Bigelow, & Lutzker, 1998). Overarching and interrelated risk factors make home safety a significant concern for families at risk or referred for CM (Metchikian, Mink, Bigelow, Lutzker, & Doctor, 1999). Childhood unintentional injuries cannot be avoided entirely, but are considered highly preventable (Theurer & Bhavsar, 2013). Proper supervision and safety precautions taken by the caregiver are a vital part of preventing unintentional injuries. Children rely on parents or caregivers to provide a safe environment, thus failing to meet these childhood needs could be considered neglectful (Peterson & Brown, 1994).

Childhood injury prevention is included in CM prevention programs as safety components that are intended to decrease hazards in the home by programs that utilize a social/ecological approach, such as SafeCare® or Triple P (Jabaley, Lutzker, Whitaker, & Self-Brown, 2011; Metchikian et al., 1999; Sanders, 2003). While researchers have stressed the overlap between home safety and families at-risk for CM, there appears to be no published research that examines the correlation between parents at risk for CM and the amount of home hazards (Azar & Weinzierl 2005). There has been even less research on home environments (hazards) and child maltreatment. Because childhood injury and child maltreatment have similar etiologies and are related to other issues surrounding future health of the child, there is a considerable potential to save lives, cost, and quality of life through preventative services.

Preventative Services

Evidence-based prevention programs reduce the cost per case of CM as well as prevent the cost in future generations by preventative interventions (Corso, Mercy, Simon, Finkelstien, & Miller, 2007). In 2012, a reported 3.2 million children received CM prevention services, based on federal and state funding for preventative services (DHHS, 2013). Over 80 percent of victims are maltreated by their biological parents; thus, parent-training interventions are common prevention services (DHHS, 2013). Prevention services can save over $22,000 in costs per case of CM over the span of their lifetime (Dalziel & Segal, 2012). In a meta-analysis of cost-benefit in home-visiting programs, the cost-benefit ratio was calculated to be an average of $2.88 per dollar spent on prevention programs (Aos, n.d.; Lee & Aos 2011).

Broadly, home visiting services provide high-risk parents with child development information, concrete parenting skills, emotional support, and access to other services or resources (Howard & Brooks-Gunn, 2009). Given the multidimensional risk factors of CM

highlighted by the social-ecological perspective, interventions must also seek to address these multifaceted components. Robust home-visiting programs demonstrated outcomes in reducing harsh parenting behaviors, improving child health and safety, reducing hazards in the home environment, increased parental engagement, and a decrease in parental depression and stress (Howard & Brooks-Gunn, 2009). In addition, evidence-based parent-training interventions such as SafeCare®, Parent-Child Interaction Therapy (PCIT), and Triple P, have been shown to reduce recidivism in families referred from child protective services or who were deemed high risk for CM (Chaffin, Hecht, Bard, Silovsky, & Beasley, 2012; Gershater-Molko, Lutzker & Wesch, 2002; Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009; Zisser & Eyberg, 2010). Children whose mothers were in prevention programs that included home safety components were shown to have fewer emergency room visits with fewer accidents and injuries that required treatment than children whose mothers were in the control groups (Howard & Brooks-Gunn, 2009).

Interventions. SafeCare and PAT are two such evidence-based home-visiting programs (EBP) focusing on parenting skills and knowledge to improve child outcomes. While there are differences between the programs, they both serve high-risk families in the first years of a child's life. A project in which these two programs were braided together to create a unified protocol (PATSCH: Parents as Teachers and SafeCare at Home) provided data for the current study. This focus of the study was to examine whether or not the braided program produces better parent, child, and home outcomes with high-risk families than PAT alone.

SafeCare®. SafeCare is an evidence-based program for parents of children from birth through five-years-old and who are at risk or have been reported for CM. It has evolved from prior CM prevention programs and now includes the most beneficial and vital aspects of CM prevention programs (Lutzker & Chaffin, 2012). In an urban research trial in California, families

that completed SafeCare had significantly fewer CM reports than families in the comparison group (Gershater-Molko, Lutzker & Wesch, 2002). In a statewide randomized control trial in Oklahoma, families receiving SafeCare had lower recidivism (17-26 percent) rates after six years compared to parents receiving services as usually (45 percent) after an initial CPS report was made (Chaffin et al., 2012). SafeCare providers, referred to as Home Visitors, deliver three core modules to parents during in home sessions: parent-child or parent-infant interaction, child health, and home safety. The purpose of having distinctly separate parent-child interaction and parent-infant interaction modules is to provide age appropriate parent-training for the child's level of activity and ability: parent-infant interaction (PII) is intended for children who are not yet walking, whereas parent-child interaction (PCI) is for children who are ambulatory until five-years old (Guastaferro, Lutzker, Graham, Shanley, & Whitaker, 2012).

Each module begins with an explanation of the behavior being trained, a demonstration of the behavior by the SafeCare Home Visitor, and then the parent practicing the skills with feedback from the SafeCare Home Visitor. This loop of modeling, practicing, and feedback continues through sessions until mastery of established criteria is attained by the parent. The parent-child (infant) interaction module aims to reduce the parental levels of stress, improve parent-child interactions, communication, and improve parental knowledge related to child development. The health module helps the parent problem-solve multiple health scenarios based on information taught and a health resource manual. The health module aims to help parents use preventative measures to maintain child's health; identify symptoms; appropriately treat child at home, and when the child is ill to take the child to a medical office, or emergency department E.D.; and keep health records for their child.

The safety module, the focus of the present research, aims to reduce the hazards in the home that are accessible to the child, meaning within the child's reach and eye sight. This is achieved by removing hazards and introducing safety methods in the home. There is a baseline assessment of hazards in the home using the Home Accident Prevention Inventory (HAPI) that has 10 categories. During the baseline assessment Home Visitors ask the parent to choose three rooms in the home on which to focus thus allowing the parent to control the home visitor's access to only the rooms specified. During intervention sessions the home visitor goes through the rooms identified by the parent explaining the hazards in the rooms as well as suggesting solutions, such as removal of hazard or securing a hazard such that it is inaccessible to the child. This process is accomplished through explanation of the hazards; modeling safe-proofing the house, practice of hazard removal by the parent, and feedback. The safety module has been demonstrated effective in reducing the overall number of hazards in the home by 80-100 percent (Edwards & Lutzker, 2008; Gershater-Molko, Lutzker & Wesch, 2003; Metchikian et al., 1999; Mandel, Bigelow, & Lutzker, 1998).

Parents as Teachers. Parents as Teachers (PAT) is an evidence-based parenting program that also uses home visitors (referred to as Parent Educators). PAT serves high-risk families by supporting parents to help improve their children's school readiness and developmental wellbeing. Parent Educators (PE) visit the families once or twice per month (depending on level of risk) and assist all children in the home from birth until they enter kindergarten, providing developmental information, encouraging parent and child interactions, and addressing parental concerns. The curriculum is focused on child outcomes and covers child development. The PE works with the child and parent to help promote the child's school readiness, health, safety, and nutrition (Albritton, Klotz, & Roberson, 2003). PAT has been shown to increase early school

performance in children from low income families with PAT services compared to children from low income families without PAT services. PAT helps narrow the gap in children's school readiness between low income and high income families. Nearly 82 percent of children from low income families that received PAT were ready for kindergarten compared with 81 percent from their more affluent peers based on a School Entry Profile of age appropriate skills and performance (Pfannenstiel & Zigler, 2007).

PATSCH. Parents as Teachers + SafeCare at Home (PATSCH) is a randomized controlled trial funded by the Annie E. Casey Foundation that braids the curricula of the SafeCare and PAT programs with the hope of best meeting the needs of high-risk families. The two programs differ in focus and duration of delivery. The primary focus of PAT is teaching parents to help increase their children's school readiness through their research-based curriculum "Born to Learn." The Primary objective of SafeCare is to decrease child maltreatment by improving the parenting skills such as parent-child interaction, home safety, and health. While SafeCare is typically an 18-week intensive program that focuses on one target child, PAT serves all children in the family from prenatal until the child begins kindergarten. PAT also has a group component where parents can meet and share information and support each other. These are both evidence-based home-visiting programs that aim to improve parenting skills in high-risk populations. The overall goal of PATSCH is to explore the effect of braiding the curricula of two evidence-based programs, specifically in families at high-risk for CM, with the hope of improving parenting outcomes, lowering the risk of CM, and improving children's developmental outcomes and school readiness.

Current Research

Because, as noted earlier, childhood injuries can occur as a function of CM, especially child neglect, and unintentional injury is the leading cause of death in children under four-years-old, it is useful to explore the link between families at risk for CM and hazards in the home. Several home visiting CM prevention programs have already proven successful at reducing CM and decreasing hazards in the home (Mechikian et al., 1999; Llewellyn, McMconnell, Honey, Mayes, & Russo, 2003). Further exploration of the potential correlation between families at risk for CM and home safety conditions, as measured by hazards in the home, could suggest the inclusion of home safety training in more CM prevention interventions.

For the purpose of the current study, preliminary data were analyzed from the ongoing PATSCH project to determine if there was a significant correlation between families at risk for CM and hazards in the home. Demographic factors such as marital status, income and education of the parent or caregiver, as well as age of the child, were assessed to determine the effect these factors may have on hazards in the home.

Methods

Data presented here represent an interim analysis from ongoing research study, PATSCH, housed in the Georgia State University (GSU) School of Public Health Center for Healthy Development. The PATSCH research was approved by the GSU Institutional Review Board.

PATSCH Methodology

The PATSCH study is a cluster randomized trial randomized at the site level to avoid any potential risk for contamination. Under the guidance of Georgia and North Carolina PAT state leaders, organizations in Georgia and North Carolina already implementing PAT and who expressed interest in PATSCH were approached to participate by the PATSCH research staff. After being presented with the full details of the study, 12 sites were randomized controlling for size, urban or rural location, and basic demographic composition of participants, specifically the number of Spanish-speaking families.

PATSCH continues active recruitment of families that are enrolled in PAT and receiving services prior to entry of the PATSCH study. PAT parent educators from agency sites who were randomized into the experimental group were trained in PATSCH (the braided curriculum) by a training specialist from the National SafeCare Training and Research Center (NSTRC). They were asked to deliver the PATSCH curriculum to families interested in receiving the braided curriculum and considered to be at high-risk for CM. High-Risk criteria were agreed upon by PAT and SafeCare stakeholders and are supported by the literature defining high risk. Families were deemed high-risk if they met two out of five inclusion criteria which were: low income, low education, English not as a native language, single parent, or teen parent. The PAT parent educators from sites randomized into the control group delivered PAT as usual to families also deemed high-risk. Each participant must have at least one child that is 0-4 years old, as this

research focused on one child and one parent family regardless of how many children are in the family, and the child of interest is called the target child. PATSCH is designed for children under 5-years-old; in order to allow for 12-month follow-up time, at enrollment a target child must be no older than 4-years-old.

PATSCH assessment data are collected at enrollment of PATSCH, or baseline before any intervention is implemented, 6-months, and 12-months postenrollment. Participants are incrementally compensated for their continued participation. At baseline assessment participants receive $40, after the 6-month assessment $50, and after the final assessment 12-months postenrollment the participants receive $60; the total possible compensation per family is $150. After baseline, the parent educators begin to deliver either PATSCH or PAT as usual depending on whether they were in the experimental (PATSCH) or control (PAT) groups to the one selected target child.

PATSCH Data Collection

Once sites were recruited, regional data collectors were hired and trained to conduct the in home baseline, 6-month, and 12-month assessments. Following consent, the data collector instructs the participant to complete an Audio Computer Assisted Self-Interviewing (ACASI) survey comprised of 12 standardized measures relating to the broad outcomes of interest; video records a 5-to-10 minute video of the parent-child interaction between the parent and target child, and video records environmental scans of two rooms in the home. Environmental scans were conducted in the kitchen and living room unless the parent expresses any objection or the layout of the home is unusual, in which case the parents chooses a substitute room such as the bedroom. If there was an unusual layout, such as a studio apartment, the two environmental scans were combined into one video of the main area, which included the living room and

kitchen in one video. The data collector attempted to record the videos of the same room(s) for all assessments unless the family is in another location, for example if the parent moved. Sony Bloggie Mobile HD Snap Cameras, model MHS TS20, were used to record videos of the two rooms. The data collectors were trained to scan the rooms slowly with the cameras, recording videos from top to bottom of the entire room so that coders can view and identifying hazards accurately.

These videos, as well as the parent-child interaction and ACASI surveys, were uploaded to a central hard drive. The data collection processes were the same for each assessment. The data were managed by GSU research staff and were kept on a hard drive that uses codes as participant IDs rather than names, on all study records. In compliance with IRB, names and participant IDs were maintained separately from the data to ensure that the participants cannot be personally identified.

PATSCH Measurement

The PATSCH assessment process consists of three data collection procedures. The ACASI which consists of 12 different measures related to child maltreatment, a video recording of a parent-child interaction, and video recordings of environmental scans of 2 rooms from the participant's home. The current research project is concerned with the video recorded environmental scans, the BCAP which measures potential for abuse, and demographic information ascertained from the ACASI.

Home Accident Prevention Inventory (HAPI). To assess the home environment, the HAPI, a validated scale originating from SafeCare, was used to measure hazards in the home (Mandel et al., 1998). The HAPI scoring form organizes hazards into 10 categories: poisonous solids and liquids; fire and electrical hazards; mechanical objects that can suffocate; small

objects/ choking hazards; sharp objects; firearms; falling, trip, and activity restriction hazards; crush hazards; drowning hazards; and organic matter hazards. If a hazard fell into more than one category, then it was counted in the category that would cause the most harm to the child. When there were more than 10 hazards clustered together, it was counted as 10+. For example, if there were 15 tacks on the floor, it would be scored as 10+ tacks on the HAPI. Hazards that were contained in one movable container were counted as one. The total from each category was summed into one total hazard score for the entire room. The HAPI was originally intended for in-person use in a participant's home where hazards were counted based on the target child's reach and eye level. However, for logistical reasons, PATSCH uses video-recorded environmental scans of rooms in the participants' homes; thus, a child's reach and eye level were not taken into account, and all visible hazards are recorded. This method was used to quickly collect data, and for the reliability of total HAPI scores.

The video recording of two rooms in the participant's home was scored using the HAPI by blinded raters who watched the videos twice: first independently then together to discuss discrepancies and agreements to come up with one score for each room with 100% reliability. The two Project Coordinators were trained to use the HAPI by a training specialist at the NSTRC. De-identified environmental scans from a previous project were used to create operational definitions and as practice for scoring videos. Once operational definitions were created, the environmental scan videos were scored independently and then reviewed by the Project Coordinators together to reach 100% agreement in a final score. Once the videos were scored, they were decoded and entered and into a database.

Brief Form of Child Abuse Potential Inventory (BCAP). Identifying the complex factors that relate to CM, such as parental stress and family conflict, allows researchers to

measure potential for abuse. The BCAP is an abridged screening tool, derived from the Child Abuse Potential Inventory (CAPI) and has been shown to predict potential for maltreatment with a similar accuracy as the original CAP (r = .96) (Ondersma, Chaffin, Simpson, & LeBreton, 2005). The BCAP has subscales that assess parental happiness, feelings of persecution, loneliness, family conflict, rigidity, and distress with a 34-item scale to detect the potential abuse of children by their parents or care givers (Ondersma et al., 2005). The BCAP is less time consuming and just as precise a measure for child abuse potential as the long form (Ondersma et al., 2005). The respondents were asked to only consider the target child identified at recruitment when answering the questions.

Current Research Methodology

The current research project is an interim analysis that is taking place in the third-year of a six-year research project, PATSCH; only baseline data have been examined here. The research presented here specifically examines the relationship between the hazards in the home environment captured through the environmental scan videos measured using the HAPI, potential for abuse indicated on the BCAP, from the ACASI, and demographic characteristics.

Study Sample. Out of 99 participants that were or are currently enrolled in PATSCH, participants' information was only used if the participant responded to the BCAP, and at least one baseline environmental scan video was created. All 99 participants met these two criteria.

Data Measurement. The data set for the current research was compiled from participants' baseline ACASI data and merged into one SPSS file. Once all current participants' baseline ACASI data were uploaded, the SPSS file was cleaned by coding for missing information. Baseline BCAP responses were collected from each participant and entered a spread sheet for manual scoring. The BCAP has seven different subscales that make up the risk scale.

Each subscale was scored along with the total risk scale for each participant. Due to missing data for the BCAP, for example because some participants refused to answer a question or skipped the question, a mean score was used to total the raw score for the BCAP risk scale and each subscale. The mean score was calculated using the raw total for the risk scale divided by the total questions answered for the risk scale.

$$\left(\frac{Total\ score\ risk\ scale}{Total\ questions\ answered\ for\ risk\ scale}\right)$$

This takes the average of the participant's score so that it is weighted the same for all participants whether they answered the same number of questions or not. There were minimal missing data, thus all scores were able to be used. Included in the BCAP is a subset of questions that determine if the respondent entering responses is lying. This lie scale was totaled and assessed based on guidelines provided by Ondersma et al (2005). From the 99 baseline responses scored, 10 participants were high on the lie scale. These 10 participants' information was not used in further analysis, reducing the sample size to n= 89. The risk scale score was entered into the main dataset under a new variable BCAP score as was each subscale total.

Data Analysis. After the Project Coordinators blind scored the hazards using the HAPI, the scores were decoded and entered into the dataset. For each video, the room type was coded and entered as well as room hazard totals. Not all baseline data collected consisted of two rooms due to varying home layouts and participant preference. To create one HAPI score for each participant, a mean score of the room(s) was computed in SPSS into a new variable.

The BCAP total risk score, BCAP subscale totals, the compiled mean HAPI scores, and demographic information collected in the ACASI were used for further analysis. Before conducting tests of interest, preliminary descriptive and frequency tests were run on demographic data to more logically recode variables.

Demographic variables: education level, marital status, caregiver's age, household annual income, race, and number of children in the home, were chosen based on the literature review of demographic characteristics of families with a higher potential of CM and childhood injury to conduct further analysis. Marital status was computed into a dichotomous variable, married or single, where single included divorced, separated, and living with a partner. Education was coded into four categories: less than high school, high school diploma or GED, some college, or college graduate. The caregiver's age was computed based on the caregiver's date of birth and the interview date. Race was combined from two variables, one dichotomous variable, if they were Latino or not, and another race variable with other races such as White, Black, Asian, Pacific Islander, Native American, or other to select from. If the respondents selected Latino then they were counted as Latino, if they selected not Latino then their response to the second race questions was counted. After reviewing the breakdown of race, Native American was removed because there were no Native Americans. There were few Asian, Pacific Islander, and "other", n=7, n=1, and n=1 respectively, so they were combined into "other" so that statistical tests could be run accurately. Frequency and descriptive tests were run again with the new categories to give characteristics of the participants.

Next, differences in the two key variables, BCAP and HAPI, by demographic variables were assessed using correlations and t-tests/ANOVA. Continuous demographic information such as income, number of children, and age of parent were entered into a correlation matrix to evaluate measurements of interest, BCAP and HAPI. A one-way ANOVA was performed on categorical demographic variables, marital status, education, and race, with dependent variables, BCAP and HAPI scores to assess whether differences in BCAP or HAPI existed for these demographic variables. To examine the primary relationship of interest, between families with

potential for CM and hazards in the home, a Pearson's correlation (*r*) was computed between BCAP total and subscales and HAPI. To determine if the relationship between BCAP and HAPI was different among different groups, the correlation between BCAP and HAPI was computed for subgroups based on the demographics including education, income, marital status, and race. Finally, a multiple regression analyses was conducted to determine if the relationship between BCAP and HAPI held after controlling for demographic variables.

Results

Demographic Characteristics

Demographics for the final analytic sample (n=89) are shown in Table 1. The age of respondents ranged from 17 to 46 years (mean = 27.60 years; SD = 6.70 years).The respondents had between 1 and 8 children living in the household with them (mean= 2.30 children; SD = 1.50). Nearly 45 percent of respondents did not graduate from high school, 32.60 percent had only a high school diploma or GED, 17.6 percent had some college and 8.20 percent had graduated college. Nearly 40 percent of respondents were married and 46 percent were single. Over 90 percent of participants were from three races: Latino, Black, and White, 40 percent, 21 percent, and 28 percent respectively. Seven participants responded "other" to race. About 65 percent of respondents made less than an annual income of $15,000, 25 percent made $15,000-$24,999, and almost 10 percent made over $25,000. The mean score on the BCAP risk scale was 4.12 with a standard deviation of 3.50, which is low, and ranged from 0 to 17. The BCAP was created with a cutoff score of 12; intending for any respondent who scores above a 12 to be considered high-risk for CM (Ondersma et al., 2005). The mean HAPI score was 16.55 with a standard deviation of 11.78.

Table 1

*Description of study participants (*N*=89)*

Variable	N	Mean (SD) %
Caregiver age	84	27.80 (6.70)
Number children in house	86	2.30 (1.50)
Race	84	-
White	23	27.40
Black	18	21.40
Latino	36	42.90
Other	7	8.30
Missing	5	-
Education	85	-
Did not graduate high school	36	42.40
High school diploma, GED	27	31.80
Some college	15	17.60
Graduated college	7	8.20
Missing	4	-
House hold income	66	-
$0-4,999	17	25.70
$5,000-9,999	15	22.70
$10,000-14,999	10	15.20
$15,000-24,999	18	27.30
$25,000 and over	6	9.10
Missing	23	-
Marital Status	85	-
Single	46	54.10
Married	39	45.90
Missing	4	-
Measures of Interest	-	-
BCAP score	89	4.12 (3.50)
HAPI score	75	16.55 (11.78)

Demographic Characteristics Relationship to HAPI and BCAP

Continuous demographic characteristics, caregivers' age, annual household income, and number of children in the home, were correlated with the measures of interest, HAPI and BCAP,

and resulted in correlations ranging from r = -.14 to r = .33 but none were statistically significant (Table 2). Using a one-way ANOVA, the categorical variables of demographic characteristics, race, education, and marital status were analyzed using the HAPI and BCAP scores as the dependent variables (Table 3).

Significant differences were found for Race and Marital Status. Blacks scored higher on the BCAP than other 5.70 versus 1.57 ($p < .05$). No difference was observed for HAPI by race. There was no difference in BCAP or HAPI by education. There was a significant difference in HAPI scores by marital status with single participants having greater number of hazards (M = 20.65, sd = 13.25), than married participants (M = 11.55, sd = 7.51), at $p < .001$. There was no difference in BCAP scores by marital status.

Table 2

Correlations between demographics and measures of interest

Variable		HAPI	BCAP
Caregiver age	*r*	.02	.01
	Sig. (2-tailed)	.86	.37
	n	71	84
Annual household income	*r*	-.14	-.13
	Sig. (2-tailed)	.33	.31
	n	54	66
Number children in house	*r*	.13	-.02
	Sig. (2-tailed)	.26	.87
	n	73	86

*None were significant at $p < .05$

Table 3

ANOVA of measures of interest and demographic characteristics

	BCAP		HAPI	
Variable	M	(SD)	M	(SD)
Race[1]				

White	4.46	(3.75)	19.73	(15.98)
Black	5.70	(3.22)	22.46	(11.35)
Latino	3.53	(3.22)	13.82	(8.84)
Other	1.57	(1.40)	10.58	(5.48)
Education				
Did not graduate high school	3.29	(3.04)	17.02	(12.82)
High school diploma, GED	4.35	(3.48)	16.55	(11.33)
Some college	4.44	(2.69)	10.85	(6.75)
Graduated college	6.23	(5.35)	24.35	(13.23)
Marital Status[2]				
Single	4.71	3.71	20.65	(13.25)
Married	3.36	(2.89)	11.55	(7.51)

[1] Significant BCAP difference between Black and Other $p < .05$

[2] Significant HAPI difference between Married and Single at $p \leq .001$

BCAP and HAPI Relationship

The main analysis of interest was the correlation between the BCAP and HAPI score that relates potential for abuse to hazards in the home to the BCAP subscales (Table 4). There was a significant correlation between BCAP total and HAPI (r=.25, p<.05). Among the BCAP subscales, loneliness (r=.272, p< .05) and distress (r=.251, p< .050) were the only two subscales that significantly correlated with the HAPI scores (Table 5).

Table 4

Correlation between BCAP, BCAP subscales and HAPI

	r(*p*)
BCAP total score	.25(.03)*
BCAP subscales	-
Happy	.01(.92)
Persecution	.21(.08)
Loneliness	.27(.02)*
Conflict	.01(.96)
Rigidity	.02(.90)

Distress	.25(.03)*
Poverty	.08(.52)

* Correlation is significant at $p < 0.05$

The moderating effect of demographic characteristics was examined on the correlation between BCAP and HAPI (Table 5). Of interest in Table 5 is whether the correlations between BCAP and HAPI vary within demographic categories. Among race groups, the strongest correlation between BCAP and HAPI was among Latino respondents ($r = .35$, $p < .05$). There was no significant correlation between BCAP and HAPI among education groups and marital status. Among annual household income groups, the strongest correlation between BCAP and HAPI was among respondents who answered $15,000-24,999 ($r = .57$, $p < .05$). A negative correlation was found among Black, Other, and respondents within an annual house hold income of $10,000- 14,999 ($r = -.25$, $p = .41$; $r = -.69$, $p = .13$; $r = -.20$, $p = .58$, respectively).

Table 5

Correlations between BCAP and HAPI within demographic categories

Variable	N	*r*	Sig. (2-tailed)
Race			
White	20	.28	.24
Black	13	-.25	.41
Latino	33	.35*	.05
Other	6	-.69	.13
Education			
Did not graduate high school	*33*	.24	.18
High school diploma, GED	*22*	.17	.45
Some college	*10*	.63	.05
Graduated college	*7*	.35	.44
Marital Status			

Single	*41*	.26	.10
Married	31	.13	.48
House hold income			
$0-4,999	15	.34	.21
$5,000-9,999	14	.24	.42
$10,000-14,999	10	-.20	.58
$15,000-24,999	12	.57*	.041
$25,000 and over	3	.80	.415

*Significant at $p < .05$

A multiple regression was conducted examining the dependent variable HAPI with independent variables: BCAP, race, caregiver age, education, number children in house hold, and marital status (Table 6). The multiple regression showed that 20.4 percent of total variability in HAPI was explained by the independent variables used ($df = 9$, $F = 2.991$, $p < .01$). The only significant predictor was marital status, such that single respondents had higher HAPI scores than married respondents.

Table 6

Multiple regression using HAPI as dependent variable

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	B	t	Sig.
Constant	14.77	5.81	-	2.54	.013
BCAP	.56	.39	.17	1.44	.15
Number of children in house	1.45	1.08	.16	1.34	.19
Caregiver's age	.168	.22	.09	.75	.45
Education	-2.26	1.72	-.19	-1.32	.19
Race	-	-	-	-	-
Other	-6.13	5.86	-.14	-1.04	.30

Black	2.92	4.10	.09	.71	.48
Latino	-6.29	3.56	-.26	-1.74	.083
Marital status*	-8.03	2.89	-.33	-2.79	.007

* Significant at $p < .01$

DISCUSSION

The overarching goal of this research was to examine the relationship between a sample of mothers at risk for CM and amount of hazards in the home. Overall, the PATSCH baseline results yielded a significant correlation (r=.25, p<.05) between mothers with an increase potential for child abuse and the number of hazards identified in the home. Mothers with a higher risk of CM, as determined by the BCAP, were shown to have a greater number of hazards in the home as measured by the HAPI. Given, the statistical link and similarity in demographic characteristics in populations of families at risk for CM and child injury, there seems ample cause to implement a unified approach by either continuing the use of safety modules in CM prevention programs or including safety in home-visiting programs that currently do not include it.

CM prevention programs, such as PATSCH, use home-visiting to intensely deliver the program's curriculum one-on-one with the target child's caregiver. While home-visiting programs require time and effort to implement, using current home-visiting CM prevention programs presents an opportunity for parent's to receive home safety sessions inside their own home, where most preventable childhood injury occurs (DHHS, 2013). This use of pre-existing programs could greatly cut down the number of children injured, 9.2 million children with nonfatal injuries annually, as well as potentially significantly reduce the immense costs attributed to CM and childhood injury (DHHS, 2013; Fang et al., 2012).

Other demographic characteristics: caregiver's age, number of children in the home, annual house hold income, caregiver's level of education, marital status, and race were assessed to determine demographic characteristics of the study sample and their relationship to the quantity of hazards in the home and potential for abuse. The one-way ANOVA on HAPI by race

showed significant differences in the amount of hazards per room by race. Blacks had the highest average of hazards per room and had a significant mean difference with the race category Other, which were mostly Asian. Black respondents scored the highest on both the BCAP and HAPI followed by White, Latino, and Other. However, these results do not mirror findings from the NCANDS report in which Whites accounted for 44 percent of maltreatment cases in 2012 (DHHS, 2013). This perhaps illuminates some limitations of the larger research project, PATSCH. There was not a significant mean difference between groups of race and BCAP (df=3, F=2.492, p=.065). Single respondents were found to have a significantly higher mean on the HAPI (mean difference = 9.10) than Married respondents. Family structure is a risk factor for childhood injury; previous findings have shown that children from one-parent families have higher risks of childhood injury (Shi et al., 2011). Correlations between continuous demographic characteristics and measures of interest, BCAP and HAPI were not found to be significant.

Demographics characteristics were tested as modifying factors of the BCAP-HAPI correlation. The BCAP-HAPI correlation was found significant among Latinos (r = .35, p < .05). Latinos participants who scored higher on the BCAP also had more hazards in their home. It is of note that the BCAP- HAPI correlation was significant in this population because they did not score high on either the BCAP or the HAPI compared to Whites and Blacks, which is congruent with data from the NCANDS report (DHHS, 2013). However, this suggests that for Latinos with a higher risk for CM there were more hazards in their homes.

Respondents who had an annual household income of $15,000-24,999 had a HAPI and BCAP correlation of r = .57 (p < .05). This correlation is considered moderate and is the strongest significant correlation seen within any category (Kozak, 2009). This finding was somewhat surprising, although this annual income is still lower than the national average, it is

above poverty level for a family of two ($15,510) or three ($19,530) (DHHS, 2013). This income range could suggest that the mothers have employment but are underemployed. Single mothers in unstable employment were found to have higher rates of physiological distress which is a predictive factor in CM (Zabkiewicz, 2010).

BCAP subscales were evaluated individually; loneliness and distress were found to significantly correlate with the quantity of hazards in the home. Parental loneliness and distress were also found in agreement with the literature to be predictors for CM by Stith and others (2009). However, the other subscales were not found to be significant in contrast with the literature, which could be explained by a limited sample size, and low overall BCAP scores. More exploration between the BCAP subscales and the HAPI could be researched to better understand predictive or underlying factors in this relationship.

One other finding that supports the BCAP subscale findings in loneliness and distress was the multiple regression model that showed marital status to significantly predict HAPI when controlling for all other independent variables (caregiver age, race, education, number of children in home, and BCAP score). The challenges of being a single mother such as energy spent child rearing combined with financial stress make finding time for themselves, and interacting with others, difficult (Wahler, 1980). However, single mothers who have contact with family, friends, or other community members are more likely to handle the stresses of being a single parent than their isolated counterparts. Lack of support and contact also contribute to intervention failure (Wahler, 1980). Wahler labeled mothers who lack social support as insular. The current findings regarding BCAP and HAPI related to loneliness may speak to this insularity.

Discrepancies between the previous findings in the literature and findings in the current research could be explained by sample size or demographic characteristics. Not all PATSCH participants' demographic characteristics align with known risk factors for families with a higher potential for abuse. Among participants in this interim sample, the average caregiver's age was 27.6 years old which is 2.2 years older than the national average of mother's age at birth of first child (Martin, Hamilton, Ventura, Osterman, Wilson, & Mathews, 2012). The participants are also regionally only from the Southeast of the United States, specifically Georgia and North Carolina, which could limit generalizability.

Despite the significant correlation between BCAP and the HAPI scores, there are limitations to these findings. Though statistically significant, the correlation is relatively weak (r= .253), however, what correlation there is between the HAPI and BCAP scores is of interest (Kozak, 2009). A larger sample size could make some of the findings more significant or produce stronger correlations. Environmental scans were scored based on videos collected by a number of data collectors which caused videos to vary, for example some videos were recorded quickly while others were slower and made viewing easier. This could have possibly affected the quantity of hazards that were counted. Hazard counts were also limited to visible items because hazards were scored through watching the videos of the environmental scans, as opposed to direct observation in the homes. Traditionally, the HAPI score is intended for a thorough examination of a room that includes opening draws and counting hazards that cannot be seen through video. Although the video quality varied, most hazards were still apparent. While some hazards may be missed due to video quality, their scores still likely reflected an accurate level of reasonably hazards in the home.

Rooms from which hazards were counted could possibly affect some participants' scores. Data collectors tried to always record video of the participant's kitchen and living room, but were not always able to do so. Due to change in location or participant preference, room type varied among participants in this sample. The HAPI score for each participant was collected from a mean of two rooms, or just one room if they only recorded a video of one room. Typically, the two rooms were the kitchen and living room, however, in some cases a bedroom was used instead of the kitchen or living room. The HAPI could also be affected by prior knowledge of the assessment date by the participant so they had time to prepare rooms for the visit.

The BCAP score was used in a continuous format for this analysis and was taken from the BCAP risk scale which consists of 24 items. Creators of the BCAP consider responders with a score of 12 or more out of 24 items to be at risk for CM. The sample mean score was relatively low at 4.12; this could have lessened the strength of correlations. The low BCAP scores could be attributed to the differences between the risk factors for CM in the sample population used in this research and high-risk families, especially maternal age and racial make-up. The majority of PATSCH participants are Latino, who have fewer counts of CM in Georgia and North Carolina than Whites and Blacks (DHHS, 2013), thus potentially lowering the BCAP sample mean.

Because the current research represents only baseline information, further research should examine variables that contribute to quantity of hazards in the home and examine 6 and 12-month assessment results. It would be informative to examine specific demographics of participants whose HAPI scores do not improve between assessments or only slightly improve to further tailor the PATSCH program's safety module to the population. A larger study with a more generalizable sample population could possibly show a stronger correlation between

families at risk for CM and have more hazards in the home. Another study conducted with families referred to child protective services, examining the hazards in their home could also help explore the relationship between this population and conditions in the home. A qualitative study conducted with caseworkers or other family service providers who are routinely in the family's homes could also shed light on the relationship between CM and home environment. Because loneliness and distress from the BCAP scores was found to significantly correlate with quantity of hazards in the home, further analysis of this relationship should be conducted. This social isolation issue as documented by Wahler (1980), should be addressed, especially relating to parenting and child welfare interventions. Parenting programs that are community-based or have a group component were shown to decrease stress, increase parenting confidence, and increase parental support (Bohr, Halpert, Chan, Lishak, & Brightling, 2010; Stern, Alaggia, Watson, & Morton, 2008).

There is an overlap in populations that are in need of CM prevention programs as well as childhood injury prevention programs. Despite the limitations, this research did find a significant correlation between these two populations, where there is potential to prevention CM, injuries to children, as well as help reduce the significant costs that other of these issues incur. If findings such as this are replicated there would be even stronger justification for using in-home safety modules such as the SafeCare module to help prevent neglect.

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