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Secondary analysis of the "Love Me. . .Never Shake Me" SBS education program

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ABSTRACT

Objective: Shaken baby syndrome (SBS) is preventable; however, an estimated 21–74 per 100,000 children worldwide are victims annually. This study examined the effectiveness of an SBS prevention program in the US.
Methods: A descriptive, secondary analysis of the Prevent Child Abuse Ohio (PCAO) "Love Me. . .Never Shake Me" SBS education program database included 7,051 women who completed a commitment statement, pre and post-test, and follow-up survey.
Results: Participants were mostly White (76%), had at least some college education (62%), were privately insured (62%), and lived with the father and infant (63%). Mothers knew of the dangers of shaking (96%) and recommended SBS education for all parents (98%) because they found it helpful (97%). Scores on the pre and post-tests were significantly different, but there was no difference based on education site or demographics. There was a significant increase in a pre/post-test item pertaining to infant crying. At follow-up, participants remembered postpartum SBS education (98%), but post-discharge did not receive SBS education from their primary care provider (62%). Most mothers practiced infant soothing techniques (79%) provided in the education; however, few women practiced self-coping techniques (36%) and accessed community support services (9%).
Conclusions: Postpartum SBS prevention education should continue. Development of SBS programs should result from these study findings focusing on education content and program evaluation.
Practice implications: Mothers report that shaken baby syndrome education is important for all parents and memorable at follow-up. Postpartum SBS education should continue because the hospital is the primary place they receive education. Mothers' report they less frequently receive education from healthcare sources post-discharge. Diligence of primary care providers to incorporate SBS prevention education in well child visits will increase parental exposure to this information. Education may need to place greater emphasis on infant crying and soothing, as well as parent support and self-coping techniques versus the dangers of shaking.

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Introduction

The most frequent cause of serious morbidity and mortality from trauma in infants is head injury resulting from child abuse (Bechtel et al., 2004; Overpeck, Brenner, Trumble, Trifiletti, & Berendes, 1998; Ventura, Peters, Martin, & Maurer, 1997). Shaken baby syndrome (SBS) or non-accidental head injury (NAHI) is vigorous manual shaking of an infant with or without impact resulting in head trauma. Accurate national and international statistics are lacking on the incidence of SBS. It is estimated that 21–74 per 100,000 children under the age of 1 suffer abusive head trauma each year in countries around the world, including Estonia, Scotland, Taiwan, the United Kingdom, and the United States (Barlow & Minns, 2000; Huang, Chang, & Wang, 1998; Jayawant et al., 1998; Keenen et al., 2003; Talvik et al., 2006). These estimates, however, are believed to be low due to the high probability of missed or incorrectly identified cases (Kost & Schwartz, 1989).

About one third of SBS victims die (Dias, Backstrom, Falk, & Li, 1998; Hadley, Sonntag, Rekate, & Murphy, 1989; Hennes, Kini, & Palusci, 2001; Sinal & Ball, 1987). The majority of SBS survivors (70–80%) endure multiple and complex health problems, such as blindness, deafness, seizures, cerebral palsy and/or paralysis (Barlow, Thompson, Johnson, & Minns, 2004; Kivlin, Simons, Lazoritz, & Ruttum, 2000; Wyszynski, 1999). These health problems produce a significant financial burden on the health care system. Initial hospitalization, lifetime intervention, and follow-up costs taxpayers millions of dollars over the survivors' life (Bopp, Fraiser, & Fitch, 1997; Ettaro, Berger, & Songer, 2004; Rovi, Chen, & Johnson, 2004). It is estimated that the direct costs of administering SBS prevention programs is about $177,000 per year (Dias et al., 2005). Given the number of infants who suffer from complications of SBS, it would be in the public's best interest to implement prevention programs. Education is the key to preventing SBS and its subsequent sequelae (Carbaugh, 2004).

SBS primary prevention literature

Currently, there are various SBS primary prevention programs throughout the World. The focus of many of these programs is to (1) increase the awareness of the dangers of infant shaking, (2) educate parents about the developmental normalcy of infant crying, and (3) educate parents about ways to cope with infant crying (Dias et al., 2005; Gutierrez, Clements, & Averill, 2004; National Center on Shaken Baby Syndrome, 2007; Prevent Child Abuse Ohio, 2004; Showers, 1992). Many programs are administered as universal primary prevention education during the postpartum period to all parents of new-born infants (Dias, 2005; Kent, 2002; National Center on Shaken Baby Syndrome, 2007; Showers, 1992). Some programs target SBS education toward high-risk parents and families during health care provider visitation (Nagler, 2002). Other programs target males who are new or future dads specifically in the military, prisons, and youth detention centers (National Center on Shaken Baby Syndrome, 2007). Unfortunately, limited research has been performed and published to actually evaluate the majority of these SBS prevention programs (Carbaugh, 2004).

To date, the authors are aware of two research studies that evaluate SBS prevention programming. One prospective longitudinal study was performed on the "Don't Shake the Baby" program provided in six maternity wards in Franklin County, Ohio (Showers, 1992). A second prospective longitudinal study was performed in maternity wards in an eight county region of western New York State (WNY) (Dias et al., 2005). The results of these studies are inconclusive about the effect of SBS education on parent behavior related to shaking. In the first study, only about half of participants were less likely to shake (Showers, 1992), while in the second study a significant reduction was found in the number of SBS cases (Dias et al., 2005). Despite this difference, both studies found that parents thought SBS education was helpful and that other parents should receive it (Dias et al., 2005; Showers, 1992). More research is needed to identify whether or not there are similar or different findings with other SBS education programs.

It is difficult, however, to compare SBS education programs because not all programs are administered utilizing the same protocols, this includes education materials, education methods, and data obtained from the participants. Furthermore, none of the education programs report program refinement according to an evidence base because there is no evidence to support this process (Carbaugh, 2004). It is important to analyze the current SBS education programs in order to assess whether they are relevant to parent needs and effective to alter parent behaviors. Additionally, evaluation of SBS education programs is a way to identify the program impact and whether funding is warranted for continued SBS primary prevention.

Imperative to the SBS program evaluation process are the instruments used to collect participant data. Neither of the two previous studies has reported reliability and validity of the instruments used to collect data. Studies that utilize invalid and unreliable measures do not provide an accurate picture of the relevance and effectiveness of SBS prevention. More research is needed for SBS education program instrument development.

The purpose of this study is to perform a secondary data analysis of the "Love Me. . .Never Shake Me" SBS education program. Prevent Child Abuse Ohio (PCAO) and The Council for Jewish Women jointly launched the "Love Me. . .Never Shake Me" program in December 2002. Since initiation, the program has expanded to provide education in several different venues across central Ohio, including hospitals, schools, and prisons. As part of the educational program, participants receive information about SBS, typical patterns of infant crying, infant soothing techniques, and self-coping strategies. Infant soothing techniques recommended included holding, rocking, singing, playing soft music, and/or feeding. Self-coping strategies recommended included exercising, calling a friend or family member, taking a time-out, meditating or deep breathing, and/or listening to music. There are four instruments used to collect participant data, which include a pre and post-test, commitment statement, and follow-up survey. The participant data from these instruments were maintained in a database that

had not been analyzed since program inception. Analysis of this existing database was based on five research questions, in order to provide information on how to develop and refine the current education program and/or instruments. The research questions are as follows:

(a) What are the demographic characteristics of the women who participated in the SBS education program?
(b) What is the percentage of responses of each item on the commitment statement, pre and post-tests, and follow-up survey?
(c) Is there a difference between the pre and post-test scores?
(d) Is there a difference between pre and post-test scores by hospital site and demographics?
(e) What is the reliability of the pre and post-test instruments?

Methods

Sample

The Ohio State University and Columbus Children's Hospital Institutional Review Boards approved the study. The "Love Me. . .Never Shake Me" database utilized excluded all participant identifiers: names, addresses, and telephone numbers. The database included 25,949 participants from all study sites from 2002 to 2005. These participants were mothers and fathers of newborns, prison-inmates, and high school students. For inclusion in this study, the participants completed the program at one of five hospitals (four postpartum units or one neonatal intensive care unit) in central Ohio, and 7,922 participants met this criterion. In addition, the participants had to be the biological mother and 18 years of age or older (born on or before 1987). A total of 7,051 participants met these inclusion criteria. Most of the 7,051 participants who met all inclusion criteria were from one of four postpartum units (91%).

Protocol

The secondary data used for the study was collected at the hospitals as follows. Nurses at the hospitals were trained by the PCAO SBS education program coordinator to recruit and deliver SBS prevention education to parents of infants. Implementation of the program was tracked by the number of commitment statements and pre and post-tests returned to PCAO by the hospital. Postpartum hospital participants were recruited following infant delivery and prior to infant discharge from the hospital. Neonatal intensive care unit hospital participants were recruited prior to infant discharge. The mothers were asked by a nurse to voluntarily participate in the "Love Me. . .Never Shake Me" program and initially provided verbal

Crying Happens!

Know what to do **before** you become frustrated:

Your baby will have times of inconsolable crying. That's how your baby communicates.

Locate a place where you can lay your baby down and walk away – a **"safe spot"** bed or playpen.

- Crying is not a reflection on your skills as a parent or caregiver. Crying can't be controlled.
- It's okay to let your baby cry – after you have tried to soothe and checked to see if your baby is fed, has a clean diaper and is not sick.
- Think about the **2-2-2** theory. Babies begin to cry as early as 2 weeks, crying peaks at 2 months and a baby can cry up to 2 hours per day.
- Premature of "colicky" infants may be more fussy. Taking care of a baby is a big job.

Remember never shake a baby!

For additional resources on Shaken Baby Syndrome Prevention, Parenting, Keeping your child safe or What to look for in good, safe childcare: 1-800-CHILDREN or keepyourchildsafe@chi.osu.edu

Get Ready for the crying to begin...

As a parent or caregiver you have a big responsibility to keep your child safe:

- Talk to the men in your baby's life. Male caregivers may be less familiar with infant soothing skills (and self-coping practices). Work with dad/dad figures to encourage bonding with your baby.
- Work with your child's caregiver to develop a plan of how to support her during stressful times. Tell your caregiver you will pick your child up immediately if the caregiver is over stressed.
- Identify a family member or friend who can support mom or dad if they need a break anytime during the day or night. Write their phone number next to the phone and call them.

Remember never shake a baby!

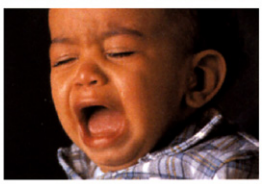

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Figure 1. Crying card.

consent. Participants performed a pre-test, watched a short video *Portrait of a Promise: Preventing Shaken Baby Syndrome* (American Academy of Pediatrics, 1995), reviewed selected educational materials (Figure 1) with a nurse, performed a post-test, and signed a personal commitment statement. They received a copy of their signed commitment statement to not shake their infant, which doubled as a written consent form. Participants also received a gift bag that contained educational brochures about SBS and crying and an infant bib and photo magnet that bear the saying "Love Me. . .Never Shake Me." A follow-up phone call to assess retention of SBS knowledge and implementation of education was non-random and occurred with a portion (4.6%) of families about 3 to 4 months after their participation.

Instruments

The pre and post-tests measure participant knowledge related to the SBS education. Each test consists of the same eight integrating questions that assess the participant's understanding of SBS and her attitudes about infant parenting. The response options for each item are different. For example, question two asks, "Shaking a baby can result in the following: (a) brain damage leading to mental retardation, (b) speech and learning disabilities, (c) death, (d) all of the above, or (e) none of the above." Question six asks, "When your baby cries you might want to try the following: (a) swaddling or rocking your baby, (b) seeing if your baby's diaper needs to be changed, (c) seeing if your baby is hungry, (d) all of the above, or (e) none of the above." The majority of the item response options are scored using weights from zero to three representing incorrect to correct responses. The total score is a proportion of items answered correctly. Higher scores indicate a greater understanding of the SBS education content.

The commitment statement captures the participants' written consent to participate, social commitment to not shake her child, and demographic characteristics. It also measures whether the respondent found the program to be new and helpful. The demographic data included the patient's name, date of birth (DOB), education level, race, medical insurance, address, and phone number, and the baby's DOB, birth hospital, and home situation. The three questions that determine if the SBS content is new and helpful are used as descriptive measures of whether participants view the program as valuable. For example, one question asks "Is this the first time you have heard that shaking a baby can be dangerous?: (a) yes or (b) no."

The follow-up survey measures what the participant remembered from the SBS education provided prior to discharge and whether the mother utilized any of the information from the education program post-discharge. The instrument consists of 16 questions. Thirteen of the questions gather descriptive information, such as participant receipt of SBS education and utilization of coping strategies and infant soothing techniques post-discharge. A few examples of questions are (1) "Do you remember receiving any information during your hospital stay about caring for your child?: (a) yes, (b) no, (c) don't know", (2) "Have you practiced any self-coping techniques suggested in the materials you received during the SBS education program at the hospital?: (a) yes or (b) no" and, (3) "Have you practiced any infant soothing techniques suggested in the materials you received during the SBS education program at the hospital?: (a) yes or (b) no." Three of the questions are from the pre/post-test instrument and reassess the participant's understanding of SBS and her attitudes about infant parenting.

Data analysis

The data was analyzed using SPSS 14.0 for Windows. Descriptive statistics, Cronbach's alphas, paired *t*-tests, repeated measures analysis of variances (ANOVA), and multiple analysis of variance (MANOVA) were utilized where appropriate to assess the above-stated research questions. Significance levels for all analyses were set a priori at $\alpha = .05$. For MANOVA, an a priori power analysis revealed that for a power of .80 and a medium effect size (.50), 200 subjects are needed (Cohen, 1987).

Data from the pre and post-test instruments were negatively skewed, so the data was log transformed prior to analysis. Additionally, participants were missing pre and post-test scores at random. Listwise deletion was imposed on the data used for the analysis of research questions three and four that examine the differences between pre and post-test scores. Listwise deletion is a conservative method to manage missing data because each participant with a missing score for either the pre or post-test is deleted from the analysis.

Seven thousand and fifty-one participants completed the commitment statement. Seven hundred and fourteen participants completed the pre-test and 5,222 participants completed the post-test. A total of 5,936 participants had the pre and/or post-test. Following listwise deletion 315 participants completed both the pre and post-tests. Please note that only the third and fourth questions ($n = 315$) pertaining to the differences between the pre and post-test scores utilized listwise deletion. All participants with a pre and post-test score ($n = 5{,}936$) were included in the second question assessing the percentage of responses on these instruments. Three hundred and twenty-one participants completed the follow-up survey.

Results

Participant demographics

There were 7,051 females who participated in the SBS education program (Table 1). Participants were most frequently 31 years of age. The majority of the women were White (76%), had at least some college education (62%) and private health insurance (62%), and lived with their infant and his/her father (85%).

Table 1
Participant demographics.

	Percentage	Mean	Mode	Range
Age (years)		28	31	18–63
Race				
White	76			
Black	14			
Other (Hispanic, Native American, and Asian)	7			
Education				
Some high school	15			
High school diploma/general equivalency diploma	23			
Some college	24			
Undergraduate degree	29			
Graduate degree (Masters and/or Doctorate)	9			
Living situation				
Both parents married with infant	63			
Both parent unmarried with infant	22			
Mom, grandparent(s), and infant	5			
Mom and infant	7			
Other situation not listed	3			
Insurance				
Private	62			
Government	35			
None	2			
Unsure of coverage	1			

Note: $n = 7{,}051$ females.

Participant instrument responses

On the commitment statement ($n = 7{,}051$), 96% of participants responded that they had previously heard about the dangers of SBS. Ninety-seven percent of participants thought the SBS education was helpful, and 98% recommended that all new parents be provided with SBS education.

The pre and post-tests results are available in Table 2. The majority (≥98%) of participants correctly responded to five of the questions (one, two, five, six, and eight) related to SBS education on both the pre and post-tests ($n = 5{,}936$). There was a statistically significant ($t = -3.67$, $p < .05$) increase in knowledge from the pre to the post-test on question four, it is okay to let an infant cry ($n = 314$). There were statistically non-significant increases in scores for questions one through three and five through eight.

At follow-up ($n = 321$), 92% of participants recalled on their own that they had received information on SBS. When asked specifically by the interviewer, 98% of participants remembered receiving SBS information. Sixty-two percent of participants reported that they did not receive other information about SBS from their pediatrician or any other source, following the birth of their infant. Of the 38% of participants who reported receiving SBS information after the birth of their infant, 52% received information from a home visitor, parenting class, billboard or radio. Only 40% received information from the infant's pediatrician or primary care provider.

Several questions on the follow-up survey assess SBS information retention and use. The majority of participants correctly defined SBS and identified the physiological consequences of shaking (97%). Ninety-four percent of participants

Table 2
Pre and post-test results: percent of participants with correct responses.

Questions	Pre-test	Post-test
1. SBS definition	99%	99%
2. Physiological results of shaking	98%	98%
3. Infants cry for no reason	75%	79%
4. It is okay to let an infant cry	74%	80%*
5. I will know what to do if I am stressed and my infant is inconsolable	98%	99%
6. Appropriate action to console infant and identify reason(s) for crying	99%	99%
7. Intense crying begins at 6 months of age	55%	60%
8. Important to screen all caregivers and share information about infant shaking	100%	100%

Note: $n = 5{,}936$.
* $t = -3.67$ (314), $p < .05$, listwise deletion implemented.

Table 3
Pre and post-test Cronbach's alpha coefficients.

Alpha coefficient	Pre-test	Post-test
Standardized Cronbach's alpha (internal consistency)	.50	.46
Cronbach's alpha (equivalence)	.19	.20

reported that they knew what to do when they became stressed when caring for their infant. The majority of participants (79%) also reported practicing infant soothing techniques, such as holding, rocking, singing and/or feeding the infant, suggested in the SBS material. Participants (92%) felt these techniques helped them to provide better care for their infant. A small percent of participants reported practicing self-coping techniques (36%) and accessing community support services (9%).

At follow-up, the majority of participants were living with their infant (99%) and the infant's father or another adult male (88%). Eighty-seven percent of the participants reported that the male in the household received information on SBS from the hospital SBS education program. Forty-eight percent of participants shared the SBS information with the male in the household if the male did not receive SBS information at the hospital. The majority of participants (68%) reported leaving their infant in the care of another adult. Of these participants, 62% reported leaving the infant with a home-based provider, while 28% reported leaving the infant with a friend, relative, or babysitter. Half of the participants reported sharing SBS information with their childcare provider.

Pre and post-test score difference

Three hundred and fifteen mothers completed both the pre and post-tests. There was a statistically significant difference between the participants' pre and post-test scores ($t = 2.26$, $p < .05$). However, there was less than one point difference between mean scores on the pre [23.18 (1.8)] and post-test [23.28 (2.1)]. There were also no significant differences in participants' pre and post-test scores based on demographics: mother's age ($F = .11$, $p > .05$), race ($F = .78$, $p > .05$), education ($F = .16$, $p > .05$), insurance type ($F = .05$, $p > .05$), living arrangement ($F = .624$, $p > .05$), or education site ($F = .02$, $p > .05$).

Pre and post-test reliability

To determine the reliability of the pre and post-test instruments both the standardized Cronbach's alpha and Cronbach's alpha were utilized (Table 3). Standardized Cronbach's alpha or internal consistency measures how well the items hang together to measure the same concept. The standardized Cronbach's alpha is .50 for the pre-test and .46 for the post-test. Cronbach's alpha or equivalence measures the variance between the items. The Cronbach's alpha (equivalence) for the pre-test is .19 and .20 for the post-test. Ideally, these alpha coefficients should be .8 or greater.

Discussion

The recommendation for and focus of most SBS prevention programs is to increase the awareness of the dangers of shaking (Loh, Chang, Kuo, & Howng, 1998; Showers, 2001). The majority of mothers in this and a previous study (Dias et al., 2005) reported that they know about SBS and that shaking is dangerous. Because there are parents who go through SBS prevention programs of this nature and still shake (Dias et al.), it may be important to emphasize other content in SBS education. Suggested content from this study that should bear more weight in SBS education includes information about infant crying and soothing and the importance of parenting support and parent mental health. Moms did learn from the program that it is okay to let an infant cry after trying soothing techniques and making sure the infant is fed, diapered, and not sick. This finding may suggest that mothers lack knowledge about infant crying and more education related to crying and soothing may be necessary due to the association in the literature between crying and SBS (Barr, Trent, & Cross, 2006). Furthermore, only a third of mothers stated they practiced self-coping techniques and even fewer mothers accessed community support services in this study. These results may indicate a lack of knowledge related to these techniques and services or a lack of time and support to initiate self-coping techniques. Future studies should focus making the content of SBS prevention programs more relevant to parent education needs.

Although mothers knew of the dangers of shaking, they recommended SBS education continue to be provided to parents. This finding is similar to previous studies (Dias et al., 2005; Showers, 1992). This could be because parents are not receiving SBS education outside of the hospital. In the U.S., the Bright Futures Initiative (Green, Palfrey, Clark, & Anastasi, 2002) which is consistent with the American Academy of Pediatrics (AAP) guidelines, places SBS education into the anticipatory guidance section for every infant visit up until the age of 1. The authors could not locate a similar international guideline; however, the literature suggests that education about SBS should be included in student health care provider (HCP) seminars on child

abuse (Kost & Schwartz, 1989). In this study, only 15% of mothers received SBS prevention information from their primary care provider (PCP). Providing SBS education during well-child visits would provide reinforcement of the education received in the hospital. More promotion of the SBS education guideline by the AAP is critical to improve prevention efforts following the postpartum period in the US Similarly, diligence by PCPs internationally to incorporate SBS prevention education in well child visits will increase parental exposure to this information. A few articles suggest that specifically nurse practitioners are in optimal positions to address SBS prevention with parents and these authors agree (Walls, 2006; Wyszynski, 1999). However, the responsibility for SBS prevention belongs to every HCP that encounters children and families (Showers, 2001).

This SBS program emphasizes that males should be educated as the largest number of SBS perpetrators are males (Starling & Holden, 2000; Starling, Holden, & Jenny, 1995). Participants in the study were asked to share with their male companions' information about infant soothing and self-coping strategies that they were taught, as well as encourage bonding of the male with the infant. This strategy is consistent with another SBS education initiative (Carbaugh, 2004). The majority of mothers ensured the infant's father or their male companion was educated about SBS. No information is available on exactly what the participants shared with the male companion and a survey of the male companion in the future would be more informative. The highly favorable response to this question at follow-up may be a result of the fact that the mothers knew from the program that it was desirable for her to educate the male in the house. Whereas, only half of mothers made certain their childcare providers were educated and a quarter of childcare providers are SBS perpetrators (Starling et al., 1995). More importance should be placed on parents educating the childcare provider.

The results show that participants' knowledge gain from the SBS education program is statistically significant. Clinical significance of this knowledge gain is likely minimal because of the negligible difference in mean scores on the pre and post-tests. This study also finds that it may be advisable to continue universal primary prevention versus targeting high-risk parents, as there is no difference in participant scores by hospital site or demographics. The lack of significance could however be due to the small mean difference between the pre and post-test scores. The majority of mothers answered the pre and post-test items correctly which created the small difference in pre and post-test scores. There are several possible explanations for this finding. First, the pre and post-test instruments are inadequate measures to capture changes in participant knowledge, which is possible due to the low reliability. This highlights the need for better evaluation measures. Second, the mothers in this sample are highly educated, so their knowledge allows them to answer correctly initially and there is no room for improvement on the post-test following SBS education. Third, the questions may be socially desirable or common sense causing all mothers to answer similarly before and after receiving SBS education.

Additional instrument development and refinement is warranted. Both the commitment statement and pre and post-tests need improved. First, the commitment statement and demographic data should be collected independently to ensure participant confidentiality. The commitment statement used in this and other studies (Dias et al., 2005) doubles as a commitment to not shake, a consent form collecting demographic data, and a baseline assessment of participant knowledge of SBS. It is not acceptable to store the consent form with participant response information such as the demographic data and baseline knowledge assessment due to the possibility of the responses later being linked back to the participant. Second, the reliability of the pre and post-test instruments is low meaning the instruments lack item consistency. Ideally, a new instrument should have questions which are unrelated that measure the same concept. It is recommended that the concept focus for a new instrument be infant crying because it was the only significant increase in knowledge in the study. In addition, infant crying is a common thread through all aspects important to SBS education (Barr et al., 2006; Biron & Shelton, 2005; Reijneveld, van der Wal, Brugman, Hira Sing, & Verloove-Vanhorck, 2004). Unreliable instruments limit the ability to correctly evaluate the effectiveness of an SBS education program and future development can ensure a more accurate depiction of program impact.

Limitations

This study has several limitations. First, it was a secondary analysis of an already existing program. Due to the secondary nature of this study, the researchers were unable to alter the program protocol and instead had to utilize the information available for the study. For example, although the commitment statement includes the mother's name and birth date, there were seven mothers who met inclusion criteria ages 52–63. It is likely these women were grandmothers or foster mothers that had custody of the infants, but without taking part in data collection there was no way of knowing. Second, the program utilized a convenient sample restricting the ability to generalize the findings of this study to the broader population. Third, there were inconsistent procedures between hospitals. Not all hospitals routinely followed the protocol as set forth by PCAO, so 7,051 participants completed the commitment statement but only 315 of these participants completed both the pre and post-test. This is common with community programs and has been seen to be a problem in the literature for other SBS prevention programs even when legislation is in place mandating postpartum education (Dias et al., 2005). Fourth, the pre and post-test instruments are unreliable for evaluation purposes and may be unrealistic for on-going evaluation as the majority of institutions returned lower numbers of these measurements to PCAO.

Conclusion

Postpartum SBS education should continue for two reasons. First, mothers report SBS education is important for all parents and it is memorable to them at follow-up. However, the SBS program in its current state warrants refinement, which should

focus on program content and evaluation instruments. Mothers report they knew of the dangers of shaking prior to the SBS education program. Concentration on the dangers of shaking may be redundant. Mothers in the current study increased knowledge pertaining to infant crying and they were reluctant to use self-coping techniques or seek assistance for infant care. Consequently, SBS education should place more emphasis on educating parents about infant crying and soothing, parent coping strategies, and community resources. Mothers also report that the majority of household males are being educated about SBS, which is positive, but the education of childcare providers is lacking. Therefore, SBS education should ensure parents know the importance of educating males as well as childcare providers. Lastly, instrument development is needed because valid and reliable instruments are necessary for program evaluation.

The second reason postpartum SBS education should continue is because mothers are not receiving education from legitimate healthcare sources post-discharge. Mothers may receive inaccurate information when provided with health information from non-healthcare providers. Postpartum education ensures mothers receive correct SBS information at least once. However, primary care providers should strive to reinforce aspects of healthy mother and infant development included in SBS prevention.

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