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A statewide nurse training program for a hospital based infant abusive head trauma prevention program

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ABSTRACT

Successful implementation of universal patient education programs requires training large numbers of nursing staff in new content and procedures and maintaining fidelity to program standards. In preparation for statewide adoption of a hospital based universal education program, nursing staff at 85 hospitals and 1 birthing center in North Carolina received standardized training. This article describes the training program and reports findings from the process, outcome and impact evaluations of this training. Evaluation strategies were designed to query nurse satisfaction with training and course content; determine if training conveyed new information, and assess if nurses applied lessons from the training sessions to deliver the program as designed.

Trainings were conducted during April 2008–February 2010. Evaluations were received from 4358 attendees. Information was obtained about training type, participants' perceptions of newness and usefulness of information and how the program compared to other education materials. Program fidelity data were collected using telephone surveys about compliance to delivery of teaching points and teaching behaviors. Results demonstrate high levels of satisfaction and perceptions of program utility as well as adherence to program model. These findings support the feasibility of implementing a universal patient education programs with strong uptake utilizing large scale systematic training programs.

The leading cause of traumatic death and injury in children less than 1 year of age is abusive head trauma (AHT), also known as Shaken Baby Syndrome (SBS) (Bruce and Zimmerman, 1984). The incidence of serious or fatal AHT in the first year of life is 34 per 100,000 (Keenan et al., 2003). The sequelae of AHT include seizures, cognitive disabilities, visual and hearing impairment, physical disabilities, cerebral palsy, and death (Keenan et al., 2006). Abusive head trauma occurs across all socioeconomic levels and among all ethnic groups. Inconsolable or excessive infant crying has been identified as a trigger for shaking a baby (Lee et al., 2007). Infant crying can be a frustrating issue for parents and caregivers who may not understand that crying is a normal development stage that although stressful will decline as the baby ages (Barr et al., 2006).

Hospital based universal primary AHT prevention programs delivered to new parents during the postpartum period are becoming more common. In the United States, at least 23 states have legislation mandating education about AHT and the dangers of shaking a baby for all new parents (National Conference of State Legislatures http://www.ncsl.org/research/human-services/shaken-baby-syndrome-prevention-legislation.aspx accessed 11/05/13). Although their content, quality, and delivery methods vary, many of these programs are designed to provide new parents with knowledge about normal infant crying and the risks of shaking. Some studies have reported decreases in number of cases of AHT

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following the implementation of hospital based education programs for new parents (Dias et al., 2005; Altman et al., 2011).

In 2007, North Carolina began a five-year statewide initiative, the *Period of PURPLE Crying*: Keeping Babies Safe in North Carolina, with the goal to educate all new parents about infant crying and its role as a trigger for AHT (Runyan et al., 2009; Shanahan et al., 2014). The *Period of PURPLE Crying* includes a hospital based universal education program provided to all parents at the time of the birth of their baby, reinforcement of key program messages in primary care settings (pediatric and family practices, public health departments and clinics) and a public education media campaign.

Successful implementation of universal education programs requires training large numbers of staff in new content and procedures. Evaluation of the training is important for both research and program maintenance. For this initiative, we utilized Kirkpatrick's typology, an evaluation framework often used to assess training programs. Kirkpatrick's model consists of four evaluative criteria: 1) trainees' reactions to the program content and training process; 2) knowledge and skill acquisition; 3) behavior change; and 4) improvements in tangible individual or organizational outcomes (e.g., staff turnover, work related accidents, productivity). According to this framework, trainees' satisfaction may be an important influence on learning, and the content of the training program must be mastered in order to produce the desired behavior change (Kirkpatrick and Kirkpatrick, 2006).

Several studies have reported the results of large-scale training programs for nurses. A statewide training was provided to public health nurses in Utah in order to improve their responses to underserved and at-risk populations (Prelip et al., 2012). A "Back to Sleep" nursing curriculum to prevent Sudden Infant Death Syndrome was presented to all newborn nursery nurses in Missouri (Price et al., 2008). Psychiatric mental health clinical nurse specialists in Georgia were provided with an online training program to integrate tobacco cessation interventions as standard practice (Amole et al., 2012). All of these studies were able to demonstrate participant satisfaction with the training, as well as increases in knowledge following training relative to a pre-training baseline. However, only one of these studies (Price et al., 2008) reported follow up assessment of sustained knowledge or changes in behavior. This study demonstrated significant improvement in participant knowledge, attitudes about safe sleep practices, and reported use of back-only infant sleep positioning, although a low response rate limited the generalizability of the findings.

Evaluations of limited scale staff trainings for hospital based education programs to prevent AHT have been reported. Registered nurses at two birthing centers in Ontario, Canada were trained in an AHT prevention program for content and delivery (Stewart et al., 2011). Similarly, all nurses working in perinatal units at two birthing institutions in Montreal, Canada attended a three hour training session and were provided written materials in preparation for implementation of an educational program on AHT for parents (Goulet et al., 2009). Nurses in both studies reported that the training provided increased their knowledge and that the information was interesting and valuable.

This article describes a statewide maternity nurse training program for a hospital based AHT prevention program in the state of North Carolina, United States and reports findings from the process, outcome and impact evaluations of this training. The evaluation strategies, utilizing Kirkpatrick's typology, were designed to 1) query nurse satisfaction with the training and course content, 2) determine if nurses perceived the training as conveying new information, and 3) assess if nurses applied lessons from the training sessions to deliver the program consistently and with fidelity, that is, with adherence to program protocols and consistent delivery of program messages.

Methods

Study design

The *Period of PURPLE Crying* is a proprietary program developed by the National Center on Shaken Baby Syndrome (NCSBS) to reduce AHT in infants. The program utilizes an educational package (DVD and booklet) given to postpartum mothers prior to hospital discharge in conjunction with delivery of key messages by maternity nurses. The program includes six key messages: 1) infant crying is normal; 2) crying peaks at about two months of age; 3) shaking a baby is dangerous; 4) parents should watch the DVD at home; 5) they should read the booklet at home, and 6) the information should be shared with others who will care for the baby (www.purplecrying.info.org accessed November 4, 2013). Maternity nurses are trained on how to present the materials to families of new babies as well as on the program's content (www.dontshake.org accessed November 4, 2013). Details of the full statewide initiative including process evaluation have been previously described (Runyan et al., 2009; Hennink-Kaminski and Dougall, 2009; Shanahan et al., 2014).

Multiple strategies were used to engage hospitals in the statewide initiative. Hospitals that were already implementing or actively pursuing a strategy to address abusive head trauma were informed about the opportunity to use a research-based program at no cost. Maternity nurse managers, who had the potential to recruit their hospitals from within, were informed about the program at Neonatal/Perinatal Outreach Education Trainer regional meetings. A letter signed by project physicians along with copies of the program materials were sent to hospital presidents or chief operation officers. The letter encouraged hospitals to become regional and statewide leaders in the initiative to reduce abusive head trauma. All recruitment methods highlighted the most compelling pieces of the program, the requirements for the hospital to join the initiative, and how the hospital would be assisted by project staff to meet the requirements. Progress was monitored and barriers addressed at weekly project meetings to ensure timely recruitment and training of hospitals.

Prior to implementation of the program, hospitals were required to sign a Memorandum of Understanding specifying key aspects of participation, including the protocol for program delivery and training criteria for the staff that would provide the program education to parents. Hospitals were expected to ensure that 100% of their staff received training. However, hospitals were provided program materials and were allowed to begin program delivery once 80% of the staff who would be likely to deliver the program had received training, with the understanding that only trained staff would provide the intervention. Fifty-minute training sessions were conducted in person by project staff or through the use of the online modules for staff who could not attend the in person training. In person training sessions were offered at varied times (i.e., weekdays, weekends, evenings) on multiple occasions at each hospital.

The primary goal of training was to educate staff about the *Period of PURPLE Crying* and the recommended program delivery model, consisting of one-to-one presentation of key teaching points; parental viewing of the educational video and accompanying booklet as part of the session; and provision of a copy of the program materials for use at home and with other caregivers. The training content addressed the science behind normal infant crying; the connection between infant crying and abusive head trauma; the meaning of the *PURPLE* acronym to describe specific characteristics of infant crying (**P**:Peak; **U**:Unexpected; **R**:Resists soothing; **P**:Pain-like face; **L**:Long lasting; **E**: Evening); and how shaking causes injury. Trainees also watched and discussed a three-