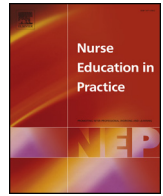




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Original research

## Nursing students: Training and maintaining universal newborn hearing screening knowledge

Alisha L. Jones<sup>a,\*</sup>, Ann W. Lambert<sup>b</sup>, Megan Barnett<sup>a</sup><sup>a</sup> Department of Communication Disorders, 1199 Haley Center, Auburn University, Auburn, AL 36849, United States<sup>b</sup> School of Nursing, Auburn University, 710 South Donahue, Auburn, AL 36849, United States

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## ABSTRACT

The purpose of the study was to obtain information concerning the effectiveness of a training program to equip nursing students in administering universal newborn hearing screening procedures, correctly recording results and clearly explaining outcomes to parent/guardians. First semester and third semester nursing students completed the National Center for Hearing Assessment and Management (NCHAM) Utah State University™ Universal Newborn Hearing Screening (UNHS) training as an in-class assignment. Students were surveyed and knowledge assessed prior to and post training. Overall results showed that all student benefited from the training.

## 1. Introduction

According to the World Health Organization (WHO 2016), 5% (about 360 million people) of the world's population has hearing loss. Approximately 32 million of the 360 million are children who have hearing loss and hearing loss is one of the most prevalent congenital disorders (CDC, 1999–2007; WHO, 2016). Internationally the incidence of congenital sensorineural hearing loss varies from 0.5 to 5 of every 1000 children (WHO, 2010). Historically, children with hearing loss often went undetected until the child was perhaps a toddler or preschooler. Sometimes the hearing loss was not diagnosed until the child was attending school. To help ensure that all infants are screened, many guidelines and protocols have been implemented by various groups to accomplish the goal of Early Hearing Detection and Intervention (EHDI) through Universal Newborn Hearing Screening (UNHS) programs (JCIH, 1994). UNHS programs vary widely internationally. According to Vos et al. (2016), 24 countries have either national (i.e. Bulgaria, Croatia, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania and Slovenia) or regional (Austria, Belgium, Czech Republic, Denmark, France, Germany, Spain, Sweden and United Kingdom) newborn hearing screening programs in place. Although this is not a complete list of all international programs. How the UNHS is implemented in the reported countries varies widely by protocol used, type of testing used, and professionals who perform the screenings. Reasons why countries do not have newborn screenings vary and many are due to limited resources (Vos et al., 2016).

For the United States, the incidence of hearing loss is 2–3 of every

1000 children born (CDC, 1999–2007). The American Speech-Language-Hearing Association (ASHA) reports that all 50 states in the U.S. and the District of Columbia have EHDI laws or voluntary compliance programs that screen hearing (n.d.). While the UNHS program has been successful in identifying hearing loss at an earlier age and initiating appropriate interventions in the identified children, the immense variation of training procedures used results in confusion. There are concerns about important information being effectively relayed between the hospital personnel that conduct the UNHS, the state, and the parents. (Pallarito, 2012; Parving and Salomon, 1996).

The purpose of this study was to obtain information concerning the utilization of a training program to equip nursing students in administering UNHS procedures, correctly recording results, and clearly explaining outcomes to parent/guardians. Attitudes towards collaborating with other healthcare professionals regarding testing methods, trouble shooting and interprofessional communication of test results were also sought.

## 1.1. Background

As early as the mid-80s, Dr. Koop encouraged early detection of hearing loss to be a focus of the *Healthy People 2000* goals for the United States. As acting Surgeon General at that time, he proposed that all children with significant hearing impairment be identified by 12 months old. As a component of the Maternal and Infant Health priority area, this had the potential to improve language access to children with hearing loss. At that time, the birth defects and developmental

\* Corresponding author. Auburn University, 1199 Haley Center, Auburn, AL 36849, United States.

E-mail address: [alj0024@auburn.edu](mailto:alj0024@auburn.edu) (A.L. Jones).

disabilities selected, within the Maternal and Infant Health area, were Neural Tube Defects (NTD) and Fetal Alcohol Syndrome (FAS) and hearing loss screening was not specifically addressed (Office of Disease Prevention and Health Promotion [ODPHP], 2000).

By 1993, a consensus statement was issued by the National Institute on Deafness and other Communication Disorders on early identification of hearing loss in infants and young children. This statement included specifications regarding advantages of early identification, advantages and disadvantages of varied screening methods and other topics. Essential to UNHS guidelines was the inclusion that all infants should be screened before the age of 3 months old. The panel also concluded that all infants who were admitted to the Neonatal Intensive Care Unit (NICU) should also be screened before discharge. (NIH Consensus Statement, 1993). The American Academy of Pediatrics (AAP) alongside the Joint Committee on Infant Hearing (JCIH) recommended that all newborns be screened for hearing loss and at future specified dates within the child's medical home (JCIH, 1994; AAP, 1999).

A number of initiatives and position statements had been developed by this time to improve care for newborns and specifically babies in the NICU. One of the main recommendations to move the program forward was for UNHS being included as a specific goal of Healthy People 2010. This time a broader goal included a specific objective for screening infants: “to increase the proportion of newborns who are screened for hearing loss by age 1 month, have audiological evaluation by 3 months, and are enrolled in appropriate intervention services by age 6 months” (U.S. Department of Health and Human Services, 2000, p.28–11.)

With many guidelines in place and funding for EHDI programs, the majority of newborns and infants in the United States are being screened for hearing loss. There was an increase in the number of infants screened for hearing loss from 2006 at 95.2% to a rate of 96.6% in 2012 (MMWR, April 10, 2015). In 2014, the CDC reported 97.9% of newborns were screened for hearing loss. (CDC, HSFS, 2016). Between 2006 and 2012, in newborns screened for hearing loss, the rate of hearing impairment diagnoses, for those who did not pass their final screening test, rose from 4.8% to 10.3%. Between 2005 and 2014 over 45,000 deaf and hard of hearing infants born in the U.S. were identified early (CDC, HSFS, 2016). Of those babies not passing the hearing screening, over 71% were diagnosed as either having or not having a hearing loss before 3 months of age. Based on these statistics, infants are being screened and diagnoses are being made early (CDC, HSFS, 2016).

Nurses working in well-baby nursery and NICU are often the point of contact for promoting and administering hearing screening, documentation, counseling parents and ensuring follow-up care. Therefore, the nurse as a care provider, advocate and educator for patients and families is crucial (Hollenbeck, 2008). Nursing students are familiar with newborn and infant developmental milestones. Information provided in a nursing curriculum includes speech and language developmental milestones. Nursing students should also understand the relationship between hearing loss and a child's ability to develop normal language skills, risk factors for hearing loss, hearing screening tools and follow-up resources available within the healthcare setting (Hollenbeck, 2008). These concepts provide a grounded basis for the graduates' entry into practice.

In some hospitals, an audiology department is available to do the newborn hearing screenings. Other hospitals have Registered Nurses (RNs) to perform the hearing screenings. In a study comparing practice and protocol data in hospital-based UNHS programs, 93% of facilities reported newborn hearing screenings were performed in the well-baby nursery by nursing staff; specifically RNs and technicians. The NICU reported 87% of the screenings were performed by nurses and some patients were screened by technicians (Ferro et al., 2006). Programs to educate student nurses about UNHS procedures and EDHI are a perfect match to train the students for skills they will use in clinical practice.

Yearly competencies for well-baby and NICU nursery staff, helps working nurses to maintain the knowledge and skills needed to

continue to deliver quality care to newborns and their families. The American Nurses Associations recommends the registered nurse must “attain knowledge and competence that reflects current nursing practice” (ANA, 2010). Education is a key element of the nursing profession and life-long learning is both expected and required to maintain licensure. As stated in the Nursing Scope and Standards of Practice, the public has a right to believe that RNs can demonstrate professional competence of knowledge and skills such as newborn hearing screening, throughout their careers (ANA, 2010). Training nurses to perform hearing screening is critical and ongoing. It is possible that as nursing staff turnover, this staffing change can impact the quality of the newborn hearing screening process (ASHA, 2012). While maintaining professional competence belongs to each individual nurse, the accountability is also shared with the employer. It is the employer's role to provide a practice environment favorable for the nurse to maintain these competencies. “Assurance of competence is the shared responsibility of the profession, individual nurses, professional organizations, credentialing and certification entities, regulatory agencies, employers, and other key stakeholders” (ANA, 2010). In one study with a UNHS program established by nurses, competencies were developed for all staff involved in the hearing screening process (Brennan, 2004). The Nurse Educator, whether in an academic or healthcare setting, has a unique role to teach the principles of newborn hearing screening to nursing students and/or nursing staff. This role involves being aware of the most current evidence-based guidelines to provide optimal care. It is essential for this nurse to be up to date on policy changes, equipment recommendations, screening protocols in order to offer excellent patient care (Selekman, 2002).

The American Academy of Pediatrics Infant Hearing position statement includes recommendations that apply to educating nursing students and nurses regarding UNHS. This set of recommendations may be used for establishing a UNHS program with guidelines for training, interprofessional communication and patient referral as needed. One recommendation includes providing in-service education and monitoring the performance of employees who perform universal newborn hearing screening. A second recommendation is to develop guidelines for documenting the results of the screening procedures. For interpersonal communication, the AAP recommends establishing a mechanism for communicating screening results to parents and physicians. (AAP, 1999). For well-baby and NICU nurses, these recommendations will increase knowledge, improve one's skill set with newborn hearing screening and guide nurses to effectively communicate with interprofessional healthcare team members and parents of children with hearing loss.

For nursing students, nurses, and other healthcare professionals, education concerning UNHS and EHDI is necessary to ensure that infants receive hearing loss screening, diagnostic evaluation and early intervention as indicated. The Baccalaureate nursing curriculum and competency requirements for working nurses will increase knowledge and improve newborn hearing screening skills to care for infants and their families. The National Center for Hearing and Assessment (NCHAM) developed a Newborn Hearing Screening Training Curriculum to standardize the way screeners are taught. After a literature review, no studies were found regarding the effectiveness of UNHS training for nursing students. The goal of this project was to obtain information concerning the effectiveness of the Newborn Hearing Screening Training Curriculum. As nursing students learn to become nurses in the workforce, this study will identify curriculum gaps that could affect patient care. Nurse Educators can then modify the curriculum for nursing students and adjust competency training for nurses to provide evidence-based newborn hearing screening care.

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