PARENTAL ANXIETY AND ATTITUDES TO NEONATAL HEARING SCREENING

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PARENTAL ANXIETY AND ATTITUDES TO NEONATAL HEARING SCREENING

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ABSTRACT

The purposes of this study were to evaluate parental anxiety and attitudes to a neonatal hearing screening program, and the relationship of parental anxiety to personal factors, and parental attitudes to personal factors. Subjects included 383 parents of infants, delivered at Songkhla Hospital and Hatyai Hospital, Songkhla, Thailand. The objectives of the study and knowledge about the neonatal hearing screening were explained to the parents before completion of the questionnaires.

The results showed that 191 parents (49.9%) were not worried when their babies received hearing screening and 168 parents (43.84%) were hardly worried. Most parents (n=310, 80.9%) were worried when the results of hearing screening showed 'not pass'. However, most parents (98.2%) reported a follow-up procedure was necessary if their babies did not pass the screening test. The results revealed that parents with a consanguineous marriage felt more anxious than parents without a consanguineous marriage. The majority of parents (76.2-99.5%) expressed positive attitudes to the neonatal hearing screening, and most of them advocated neonatal hearing screening considering the hearing screening to be worthwhile. It was found that parental attitudes had a significant relation to the gender of parents, body weight of the newborn, and number of siblings. It was revealed that mothers had a more positive attitude than the fathers. The parents whose babies weighed 3,000 grams or less had a more positive attitude than the parents whose babies weighed more than 3,000 grams. The parents who had 2 children showed a more positive attitude than the parents who had one child or those who had 3 or more children.

The findings of this study indicated that most parents had positive attitudes to the neonatal hearing screening, though some parents were worried. These findings could be used as a guideline for hearing screening of all newborns and as a guideline to inform both parents and health professionals concerning the importance of a newborn hearing screening program.

KEY WORDS: NEONATAL HEARING SCREENING / ANXIETY OF PARENTS / ATTIUTDES OF PARENTS
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ความวิตกกังวลและทัศนคติของผู้ปกครองที่มีต่อการตรวจคัดกรองการได้ยินในทารกแรกเกิด
(PARENTAL ANXIETY AND ATTITUDES TO NEONATAL HEARING SCREENING)

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บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความวิตกกังวลและทัศนคติของผู้ปกครองที่มีต่อการตรวจคัดกรองการได้ยินในทารกแรกเกิด รวมทั้งศึกษาความสัมพันธ์ระหว่างความวิตกกังวลและทัศนคติกับข้อมูลส่วนบุคคล กลุ่มตัวอย่างเป็นบิดามารดาของทารกที่คลอด ณ โรงพยาบาลสงขลาและโรงพยาบาลหาดใหญ่ จังหวัดสงขลา จำนวน 383 คน กลุ่มตัวอย่างได้รับทราบวัตถุประสงค์และความรู้เกี่ยวกับการตรวจคัดกรองการได้ยินแล้วกลุ่มตัวอย่างตอบแบบสอบถามหลังลูกได้รับการตรวจคัดกรองการได้ยิน

ผลการศึกษาพบว่า บิดามารดา 191 คน (49.9%) ไม่มีความวิตกกังวลเมื่อลูกได้รับการตรวจคัดกรองการได้ยินและบิดามารดา 168 คน (43.84%) มีความวิตกกังวลเล็กน้อย, บิดามารดาส่วนใหญ่ (n=310,80.9%) มีความวิตกกังวลเมื่อผลการตรวจไม่ผ่าน อย่างไรก็ตาม บิดามารดา 376 คน (98.2%) จะนำลูกมาตรวจซ้ำตามนัดหากผลการตรวจไม่ผ่าน ผลการศึกษาความสัมพันธ์ระหว่างความวิตกกังวลของบิดามารดาและปัจจัยส่วนบุคคลพบว่าบิดามารดาที่แต่งงานในเครือญาติมีความวิตกกังวลต่อการตรวจคัดกรองการได้ยินมากกว่าบิดามารดาที่ไม่ได้แต่งงานกันในเครือญาติ ในด้านทัศนคติต่อการตรวจคัดกรองการได้ยิน บิดามารดาส่วนใหญ่ (76.6-99.5%) มีทัศนคติด้านบวกต่อการตรวจคัดกรองการได้ยินในทารกแรกเกิด บิดามารดาส่วนใหญ่สนับสนุนการตรวจคัดกรองการได้ยิน และเห็นว่าการตรวจคัดกรองการได้ยินมีประโยชน์ต่อทารก ผลการศึกษาความสัมพันธ์ระหว่างทัศนคติของบิดามารดาและปัจจัยส่วนบุคคลพบว่า ทัศนคติของบิดามารดาต่อการตรวจคัดกรองการได้ยินในทารกแรกเกิดมีความสัมพันธ์กับเพศของบิดามารดา, น้ำหนักแรกเกิดของทารก, และจำนวนบุตรที่มีชีวิตอย่างมีนัยสำคัญทางสถิติ โดยมารดามีทัศนคติด้านบวกต่อการตรวจคัดกรองการได้ยินมากกว่าบิดา, บิดามารดาที่มีบุตรน้ำหนักแรกเกิด 3,000 กรัมหรือน้อยกว่า 3,000 กรัมมีทัศนคติด้านบวกต่อการตรวจคัดกรองการได้ยินมากกว่าบิดามารดาที่มีบุตรน้ำหนักแรกเกิดมากกว่า 3,000 กรัมและบิดามารดาที่มีบุตร 2 คนมีทัศนคติด้านบวกต่อการตรวจคัดกรองการได้ยินมากกว่าบิดามารดาที่มีบุตร 1 คน, 3 คนหรือมากกว่า 3 คน

ผลที่ได้จากการวิจัยครั้งนี้แสดงให้เห็นว่าบิดามารดาส่วนใหญ่มีทัศนคติด้านบวกต่อการตรวจคัดกรองการได้ยินในทารกแรกเกิด แม้ว่าบิดามารดาบางคนจะมีความวิตกกังวล ผลที่ได้จากการวิจัยครั้งนี้สามารถใช้เป็นแนวทางสำหรับการตรวจคัดกรองการได้ยินในทารกแรกเกิดทุกคน และเป็นแนวทางในการให้ข้อมูลกับผู้ปกครองและผู้ที่ทำงานเกี่ยวกับการดูแลรักษาทารกแรกเกิด ให้เห็นถึงความสำคัญของการตรวจคัดกรองการได้ยินในทารกแรกเกิด

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CHAPTER 1
INTRODUCTION

Statement of the problem

Sensorineural hearing loss is one of the most common abnormalities present at birth. The incidence of bilateral hearing loss is 1 to 3 per 1,000 infants in the well-baby nursery population, and 2 to 4 per 100 infants in the intensive care unit population (1). Hearing impairment occurs at birth or during the first two years of life is likely to have serious effect on the development of a child's speech, language, and learning skill (2). Some studies found that infants with hearing loss who were identified early and received optimal intervention by the age of 6 months fared significantly better in terms of communication development than children identified later (3,4). The American Academy of Pediatrics supports the statement of the Joint Committee on Infant Hearing (1994), which endorses the goal of universal detection of hearing loss in infants before 3 months of age, with appropriate intervention no later than 6 months of age (5).

In Thailand, neonatal hearing screening by evoked otoacoustic emissions (EOAEs) has been started in the detection of peripheral auditory dysfunction. However, otoacoustic emissions test given in first 36 hours postpartum may yield "false positive" results, probably due to amniotic fluid in the middle ear, or external ear occluded with vernix, creating transient, conductive hearing loss (6). Thus, the early discharge in the first 48 hours postpartum from maternity unit results in an increase in screening false positive not only the "false positive" screening that may result in psychological harm and unnecessary parental anxiety and the hearing screening procedure in the newborn may cause much parental anxiety (7,8). This unnecessary anxiety may affect emotional, psychological, and behavioral stresses between the infant and parent (3). Many studies concerning maternal anxiety related to the screening test, such as alfa fetoprotein screening for Down's syndrome and cystic

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fibrosis have shown significant anxiety especially in young females who had a fetus with a heart malformation (9,10,11).

Sutton et. al. (12) point out that screening test can cause a wide spectrum of anxiety, varying from a transient mood state to a severe anxiety state symptomatic of psychiatric morbidity. Marteau (13) reported high levels of anxiety parents of Down's syndrome infant which may cause health problem, and may reduce the parents' activities. Oppositely, Watkin et. al. (14) found that 58% of parents wished their child to be identified earlier in a newborn hearing screening program. Barringer & Meuk (15) found 88 % parents' who believe that the anxiety caused by unpass hearing screening would be great benefit of early detection if a hearing loss was found to be presented.

Concerning maternal anxiety to Universal Neonatal Hearing Screening (UNHS) has been debated, it is now well established as a standard of care in many countries (14). In Thailand, the UNHS program has been established since the past few years and parent's consent is needed before testing. This research aimed to study parental anxiety and attitudes to neonatal hearing screening program.

Research Purposes

The purposes of this research were to:

1. Study rate and severity of parental anxiety to neonatal hearing screening program.

2. Identify factors of sex of parents, age, education level, occupation, family income, gestational age, gravida, number of sibling, history of hearing loss in family and consanguineous marriage which were related to parental anxiety to neonatal hearing screening program.

3. Identify parental attitudes and suggestions to neonatal hearing screening program.

4. Identify factors of sex of parents, age, education level, occupation, family income, gestational age, gravida, number of sibling, history of hearing loss in family and consanguineous marriage which were related to parental attitudes to neonatal hearing screening program.

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Research Questions

1. Did parents have anxiety to neonatal hearing screening program? If yes, How much was severity?

2. What were the important factors related to parental anxiety to neonatal hearing screening program?

3. What were the parental attitudes and suggestions to neonatal hearing screening program?

4. Which factors were related to parental attitudes to neonatal hearing screening program?

Expected Outcomes

1. Problems with parental anxiety and attitudes to neonatal hearing screening program would be disclosed.

2. Results of this study should be used as guideline for effective nation-wide neonatal hearing screening program.

3. Results of this study should be used as guideline for planning for parental educational program.

Definition of Terms

Neonatal hearing screening means the hearing screening in infants by using evoked otoacoustic emissions (EOAEs) (2).

Parental attitudes means a predisposition to respond to neonatal hearing screening in a generally favorable or unfavorable (16).

Parental anxiety means feeling of uncertainty, uneasiness, apprehension, tension, worry and nervous of parents when a hearing screening program have been administered to their babies (17).

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History of hearing loss in family means in family had person whose deafness was indeed present at birth or the one who suffered a significant hearing loss (18).

Consanguineous marriage means marriages between close biological kin (19).

Infant at risk of hearing impairment means infant having high risk for hearing impairment as suggested by the guidelines (20).

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CHAPTER 2
LITERATURE REVIEW

This research aimed to describe parental anxiety and attitudes toward neonatal hearing screening, and factors related to anxiety and attitudes of parents. The literature review includes universal newborn hearing screening, anxiety of parents toward universal newborn hearing screening, factors underlying parental anxiety, attitudes of parents toward universal newborn hearing screening, and factors underlying parental attitudes.

2.1 Universal newborn hearing screening

Universal newborn hearing screening (UNHS) has been proposed as a mean to speed diagnosis and treatment and thereby improve language outcomes in newborn with hearing loss (21). Screening for hearing loss in the public school of the United States has been in practice since the 1930s, and nearly every state has some sort of mandate hearing screening program to identify the child with an educationally handicapping hearing impairment. In the past, hearing screening program for newborn babies have been established in an effort to identify early the presence of severe-to-profound hearing loss so that habilitation measures can be instituted as soon as possible (22). Moreover, these program have traditional targeted only neonates and infants at risk for hearing loss. Universal detection of infant hearing loss require universal screening of all infants. Screening by high-risk registry alone (eg, family history of deafness, congenital infection, birth weight less than 1500gm, bacterial meningitis) can only identify approximately 50% of newborns with significant congenital hearing loss (23,24,25). In 1970, the American Academy of Pediatrics, the Academy of Ophthalmology and Otolaryngology, and the American Speech and Hearing Association met as a “National Joint Committee on Infant Hearing Screening”

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to discuss the state of newborn hearing screening. The Joint Committee recognized the need to identify hearing loss early in life by the use of behavioral observation hearing screening tests, but concluded that mass hearing screening for other than research purpose could not be justified. This was due to the lack of an appropriate test procedure for identifying hearing loss in newborns (26,27). In 1982, the Joint Committee on Infant Hearing recommended identifying infants at risk for hearing impairment by means of seven criteria and suggested follow-up audiological evaluation of these infants until accurate assessments of hearing could be made (22,27). In 1990, the U.S. Department of Health and Human Services (HHS) issued a report entitled Healthy People 2000. The purpose of the document was to set goals directed at improving the health of the citizens. Important to bolstering newborn hearing screening efforts was the explicit recommendations to reduce the age of identification of children with hearing loss to 12 months or less (28). For decades, the average age of identification for hearing loss was between two and three years, for later than it should be according to the National Institutes of Health (NIH) and the Joint Committee on Infant Hearing (JCIH) recommended that hearing loss at birth be identified by three months of age and intervention begun six months of age, that screening by using a two-stage screening processes: an initial screen by evoked otoacoustic emissions (EOAEs). All babies who pass the hearing screening are discharged; babies who fail the screening are referred to audiologists for a screening auditory brainstem response (ABR) and for diagnostic evaluations as needed (1,2,3,26).

Incidence of congenital hearing loss has been reported as high as 1.4-2/1000 in newborn (29,30,31). The critical caused of communication problem in the first two years of life is hearing loss (2). Approximately 3 of every 1000 babies born will exhibit a hearing loss significant enough to affect speech and language development and other areas of development (32). Children with hearing loss experience delayed development in language, learning, and speech. Impairment exists as early as age 3 years and has consequences throughout life, leading to lower reading abilities, poorer school performance, and under- or unemployment (33). The benefits of universal newborn hearing screening for children with permanent hearing impairment are that early identification is associated with better expressive and receptive language, speech,

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and social and emotional development. Children who are identified before the age of 6 months show substantial benefit in the first five years of life (3,34,35,36). Data showed that the infant with a significant hearing impairment who receives intervention by 6 months of age will perform significantly better in language development than the infant who is identified after 6 months of age (4,37).

UNHS began in the United State in several geographic locations, the state of Rhode Island, Hawaii, and Colorado in the early 1990s (37). The Colorado Newborn Hearing Screening project began in 1992 with a small-grant through the Colorado Department of Public Health, with 26 of 52 targeted hospital participated through 1996, and nearly 60 % of all newborns currently being screen (38,39). UNHS began in New York State in 1994, the average number of infants screened was 94.7-97 % (27). In the late 1990s, the development of rapid, low-cost screening tests made it feasible to implement screening programs for all newborns for congenital hearing loss during the hospitalization. Currently, acceptable methodologies for physiologic screening include evoked otoacoustic emissions (EOAEs) and auditory brainstem response (ABR), either alone or in combination (1). Both methodologies are noninvasive, quick, and easy to perform, although each assesses hearing differently. EOAEs measures sound waves generated in the inner ear (cochlea) in response to clicks or tone bursts emitted and recorded via miniature microphones placed in the external ear canals of the infant. Although EOAEs screening is even quicker and easier to perform than ABR, EOAEs may be affected by debris or fluid in the external and middle ear, resulting in referral rates of 5% to 20% when screening is performed during the first 24 hours after birth. ABR measures the electroencephalographic waves generated in response to clicks via three electrodes pasted to the infant's scalp. ABR screening requires the infant to be in a quiet state, but it is not affected by middle or external ear debris. Referral rates < 3% may be achieved when screening is performed during the first 24 to 48 hours after birth (36,37,38). The American Academy of Pediatrics recommended that refer rates at hospital discharge should not exceed 3% (32). Referral rates from the initial in-hospital screening are reported to be 5-8 % for otoacoustic emissions and 2-8 % for automated auditory brainstem response (40,41). From several studied showed that at the initial test, false positive test results are likely to occur in approximately 3% to 12

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% of infants (36,41,42). There are concerns that a false positive screening result in parental anxiety, with a negative effect on the parent-child relationship (43).

Recently, UNHS began in Thailand in several geographic locations. The average number of infants screened was 96.23%, the referral rate of 4.89%, and false positive rate of 3.67% (44).

2.2 Anxiety of parents to newborn hearing screening

Anxiety is a commonly experienced feeling (45). Anxiety is a normal reaction to a stressful or dangerous situation (46). Anxiety is the initial response to a psychiatric threat. Because anxiety is a form of energy, it is not accessible to direct observation. It must be ascertained mainly through a client's self-report. An anxious client may describe the subjective expert of anxiety as involving vary feeling of vague discomfort, uncertainty, self-doubt, diffuse apprehension, dread, restlessness or jumpiness, jitteriness, helplessness, powerlessness, and irrationality (47). Spielberger's concept explained an anxiety as a stressful event when the person perceived harm to mental or physical health and praised this as threatening (17).

Anxiety is a part of our lives, and occurred when something were stimulated externally (example situation) or internally (idea, feeling, need) (48,49). It is a normal and protective response to events outside the range of everyday human experience. Anxiety caused from frustration, conflict, stress, uncertainty, guilty feeling that was not responded to desire and drive (47,50,51,52). Anxiety is not necessarily bad. When it is experienced in small, controllable amounts, anxiety is a motivating force. It is the energy which motivates the individual to chance (53).

PePlau identified four levels of anxiety and described effects on the individual as follows. First, mild anxiety, this is normal anxiety that is part of day-to-day living. During this stage the person is alert and the perceptual field is increased. The person sees, hears and grasps more of the stimuli around them. This kind of anxiety can motivate learning and can produce growth and creatively. Second, moderate anxiety, as the level of anxiety increased, the extent of the perceptual field diminishes. The The perceptual field becomes limited to perceptions about the

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immediate task at hand. When the perceptions field is limited by increasing anxiety the ability to think clearly diminished; the person is less able to mobilize a variety of responses for problem solving and effective resolution of anxious feelings. Third, severe anxiety is marked by a significant reduction in the perceptual field. The person tends to focus on specific detail and does not think about anything else. The person would have a great deal of difficulty completing a task. All behaviors becomes directed toward reliving anxiety. Because the ability to solve problems is so limited, efforts to relive anxiety are quite likely to be random and/or ineffective. Fourth, panic, in this most intense state of anxiety, the person in unable to focus on even one detail within the environment. Misperceptions are common and a loss of contact with reality may occur. The person may experience hallucinations or delusions. Behavior may be characterized by wild and desperate actions or extreme withdrawal. Human functioning and communication with other are ineffective (47).

In conclusion, mild to moderate anxiety may be beneficial and heighten one's capacities to learn and solve problems whereas severe and panic level paralyze or overwork capacities resulting in loss of control.

All new mothers are somewhat anxious. Being a mother is a new role, a new job, with a new person in life. Some mothers have excessive worries and experience a severe level of anxiety. Childbirth is one of the most dramatic events in a women's life. The postnatal period is also a time of increased risk of the onset of anxiety disorders for women (52). Symptoms of postpartum anxiety may include: intense anxiety and/or fear, rapid heart rate, sense of doom, overwhelming dread, hot or cold flashes, chest pain, shaking, dizziness, and insomnia (54).

Bess & Paradise expressed concern that maternal anxiety may result from hearing screening result and referral for additional testing (55). Sorenson et. al. (56) reported that 36% of parents involved in genetic newborn screening programs had concerned about their child's health.

The several studies have shown that screening children for diseases, such as cystic fibrosis, metabolic disorders, or cancers, can cause considerable parental concern when the child fails the screening test (9,10,56,57). Watkin et. al., studied maternal anxiety to UNHS at Whipps Cross Hospital in the East London Borough of Waltham Forest by using TEOAEs. Prior to testing, parents were given a leaflet that

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explained the test and the reasons for screening the hearing at this age. The results were termed TEOAE 'recorded' or 'not recorded' without using the words 'pass' or 'fail'. The mothers were questioned at three different stages: after the initial test; after the retest at six weeks; and again at nine months. Anxiety was measured by scale forced choice questions. The mothers were asked whether the hearing screening, their babies had just received, had made them "very worried, fairly worried, hardly worried, or not at all worried". The results of anxiety at the initial test showed that 230 mothers (70%) were not at all worried about the hearing screening, with 66 (23%) hardly worried and 15 (5%) being very worried. The result of anxiety at the retest showed that 56 mothers questioned, 3 (5.35 %) mothers were fairly or very worried, with 53 (94.65 %) mothers not at all worried or hardly worried. Six babies failed the retest and required further diagnostic testing and all mothers were hardly worried at the retest. In this study at stage 1 screening 92% of mothers reported that they were satisfied or very satisfied with the explanation about the purpose and practical details of the screening. However, 34% of mothers reported that they had never read the information booklet given to them. The researchers conclude that providing information during ante natal classes (ANC) and in more imaginative formats such as videos, may encourage parents to be more informed and thus less anxious (58).

Magnuson and Hergils studied the parental view on neonatal hearing screening. A total of 49 parents participated in the interviews. The results indicated that the parents had very little anxiety and no difference in anxiety between mothers of screened and unscreened babies. Anxiety was evoked when the child did not pass the first retest. These parents needed individual counseling and support during the time of audiological assessment, and a plan for future action (59).

Vohr et. al. investigated the prevalence and degree of maternal worry about neonatal hearing screening at the time of an initial neonatal hearing screening and rescreening. The samples were collected on 307 mothers at the time of the neonatal hearing screening and 40 mothers at the time of the rescreening. The results showed that degree of maternal worry was significantly greater at the rescreening compared to the initial screening. Mothers reported greater worry at the time of the screening were more likely to be socioeconomically disadvantaged.

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Although maternal knowledge about hearing screening increased between the two time periods, degree of worry remained unchanged. Moreover, Vohr et. al. found that despite an extensive multimedia information strategy to inform parents about hearing screening prior, only 29% of mothers of neonates reported that they were aware of the hearing screening program prior to being hospitalized for childbirth. Furthermore, mothers of lower socio-economic status were less likely to have read the literature provided prior to hospital admission (60).

Weichbold and Welzl-Muller investigated the mothers' anxiety towards neonatal hearing screening. Using a standardized interview, 40 mothers were questioned, 38 of whom already knew about this type of health check. The results indicated that 20 mothers who were interviewed about their anxiety following a positive result their baby had received on the first test, only 2 (10 %) declared to be very worried. Of 15 additional mothers whose babies had failed the screening, 4(20%) mothers were worried, 2 (10%) of whom stated that they had not been informed about the screening well enough (61).

Weichbold and Welzl-Mueller studied maternal concern about unpass hearing screening (positive) test results in universal neonatal hearing screening. They investigated maternal concern in 2 different situations: 1) when the infant's results were false-positive at the first test and 2) during the 1-month period that the mothers had to wait for the audiological assessment after their infants had failed the screening. The study was conducted over a 1-year period, in which all mothers whose infants tested positive in the first stage or failed the screening were questioned about their level of concern attributable to the positive test result. The results revealed that 85 mothers whose infants tested positive in the first-stage test (situation 1), 34 mothers (40%) did not know the result. Of the remaining 51 mothers, 59% were not at all concerned and 27% were only slightly concerned about the result, whereas 14% were highly concerned. Of 43 mothers whose infants failed the screening (situation 2), 42% not being worried and 37% only slightly worried, whereas 21% were highly concerned about the positive screening result (62).

Clemens et. al. studies of 49 mothers of infants who had failed stage 2 screening found that risk factors associated with lasting anxiety were: maternal college education; not fully understanding the meaning of the test results and the infants

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having a false positive result at stage 2 screening; although none of these factors reached statistical significance (31). With regard to not understanding the test result, 55% of mothers believed that the purpose of the test and the meaning of the results were not adequately explained.

Therefore, the anxiety of the parents should be occurred because hearing screening were administered to their babies, and anxiety was more activated when their babies were failed the screening test.

2.3 Factors underlying parent's anxiety

The following personal profile: age, gender of parent, educational level, occupation, income, gestational age, complication during pregnancy, type of labour, birth weight of newborn, gravida, number of sibling, history of hearing loss in family, and consanguineous marriage, which may affect anxiety of parents whose infants were performed the screening test.

Age is a considerable factor related to maternal anxiety because psychosocial maturation is developed according to age. Lazarus and Folkman (63) have described that when the person is older, he or she has faced to the crisis event, more experienced, and seniority. He or she can generate critical thinking and use effective coping. Similarly, the study of Mile et. al. (64) found that younger parents had more stress than older parents. Standley et. al. (65) studied prenatal anxiety of women influence on pregnancy outcome. The results showed that younger women were related anxiety about pregnancy and childbirth. Rona et. al. (11) found that anxiety was highest in young females who had a fetus with a heart malformation. The transition to parenthood may be difficult for adolescent parents. These young parents may experience difficulty accepting a changing self-image and adjusting to new roles related to the responsibilities of infant care (66). Paykel (67) found a significant association between young mother and depression. This finding was different to that of Kumar & Robson (68) who found postnatal depression occurred significantly more often in older women who seemed to have serened pregnancies and independently in women who gave a history of trying to conceive for two or more years.

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Gender is a part of physical personality development they affects anxiety (63). The woman's emotion is sadness, irritability and anxiety whenever the hormone level is low, whereas the males always were lower anxiety than females because the androgen hormone make them have a strong outstanding characteristic, aggressive behavior and more expressions. This supported the study of Rukholm (Rukholm et al,1983 cite by 69) which found that the anxiety of female relatives during the crisis situation was higher than those of male. Similarly, the study of Benfield et. al. (70) found that mothers of critically ill infants reported more sadness, loss of appetite, guilt, anger, disbelief, depression, and crying than fathers. Philipp (71) found that mothers retrospectively recalled more anxiety than fathers, although their later perceptions of the child did not differ.

Educational level is a factor that indicates coping ability of caregivers. Highly educated person is easier to communicated and understand information or instruction received (72). Education enhances mother's cognitive development, highly educated mothers usually have a chance for seeking knowledge, problem solving technique and resource to cope with the critical events. Duration of education is a crucial factor influencing an individual's ability to develop intellectually, which is very important to hims/hers adaptation (73). Also, Vohr et. al. found that lower maternal education was associated with increased anxiety (60). Conversely, in a study of maternal concern during pregnancy in 202 women, Light and Fenster (74) found that women with more than 12-years of education had a significantly higher anxiety during pregnancy about to being exposed to X-ray before knowing of pregnancy and effect on the child and birth defects, to any medication they used than women with lower than high school or less education.

Occupation: Kongpan (75) studied the relationship among coping strategies and general well-being in mothers of hospital child. This study found that there was a positive relationship between mothers' occupation and amount of coping strategies. She reported that mothers who were housewives were less effective coping than mothers who were employees.

Family income: Economic stress was another important factor, as the parents of infants need to spend a considerable sum of money during the baby's deliver. The parents of infants who had low income will be more stressed than those

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who had higher income. Because of good income, the mothers should be able to sustain and support life basic needs. The mothers could provided what she need for herself and she didn't worry about economic problems (75). Low income, on the other hand, was terrible to face the uncertainly of family economic status. Kongpan's study (75) found that there was a positive relationship between mothers' income and reforming family problem.

Birth weight : Copper et. al. (76) found that stress was significantly associated with low birth weigh.

Gibson et. al. studied maternal anxiety following neonatal screening and investigation for occult spinal dysraphism. Results indicated that 23 % of the mothers were very worried by the information given, and anxiety was not correlated with the baby's age, sex of the baby, maternal age or number of siblings (77). Research by Miedzybrodzka indicated that the level of anxiety decreased soon after the results of the screening test had been shown negative (78).

2.4 Attitudes of parents to newborn hearing screening

An attitude is a learned and relatively enduring tendency or predisposition to evaluate a person, event, or situation in a certain way and to act in accordance with that evaluation. An attitude is a predisposition to respond to a particular object in a generally favorable or unfavorable way (16).

Social psychologists distinguish three components of an attitude; the cognitive, the affective (or evaluation), and the conative (or behavioral). First, the cognitive component consists of thoughts and beliefs about the attitude object. The cognitive component is the way one perceive the object, event, or situation our thoughts, beliefs, and ideas about something. Second, the affective component of an attitude consists of the feelings or emotions of the gut reactions-that the object, event, or situation, or its symbolic representation, evokes within individual. Fear, sympathy, pity, hate, anger, envy, love, and contempt are among the emotions that may be excited by a given individual or group. Third, the conative component of an attitude is

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the tendency or disposition to act in certain ways with reference to some objects, events, or situations (79).

Each attitudes serve at least one of three functions. The first is the heuristic or instrumental function. Second, attitudes serve a schematic or knowledge function-that is, they provide us with a meaningful environment and guide behavior. Third, attitudes both define the self and maintain self-worth (79).

Watkin et. al. (80) studied the opinions of the parents of hearing impaired children on the need for neonatal hearing screening. The results indicated that most parents of deaf children would have welcomed neonatal identification. This opinion was shared by the parents, even when their child had a mild or unilateral impairment. Also, they studied maternal attitudes to universal neonatal hearing screening. Attitudes were measured by two-choice questions. Agreement or disagreement with six statements about the screening were also recorded. The results of attitude at the initial test showed that of 288 mothers questioned, 280 (97%) mothers considered the hearing screening to be worthwhile, with 3 (1%) mothers think it was not so, and 5 (2%) express no opinion. A total of 242 (84%) respondents thought that the screening should be undertaken after leaving the maternity unit but before 2 months of age, 9 (3%) want it between 2 and 7 months, and 6 (2%) want to wait until their child was 7-9 months old. The result of attitude at the retest showed no significant increase in the negative attitudes ($p>0.02$). The result of attitude at nine months showed that of 150 mothers, 143 (95%) mothers remembered the results of the initial screening, with three (2 %) were failed to remember, and three (2%) having to check their parent-held record.

Magnuson and Hergils studied the parents' view on hearing screening in newborns. The results indicated that majority of parents had positive attitude toward hearing screening. The parents expressed the advantage of hearing screening was the potential to help and understand their child at the earliest possible time if a hearing impairment was detected (59).

Hergils and Hergils studied the parental attitudes and concerns in relation to universal neonatal hearing screening by otoacoustic emissions (OAEs). The parents of 87 children who had participated during the first year in the University Hospital, Linkoping, Sweden. The questionnaires were given to the parents during routine

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medical check-up at the well-baby clinic when the infants were 5-6 months of age. Ninety-five percent of parents stated that they had a positive attitude toward neonatal hearing screening, 1% were ambivalent and 4% had negative attitude about it. Seventy-seven percent of parents reported that information provided with the test were found to be sufficient, whereas 11% of parents had negative comments about it (e.g. they wanted more information about the otoacoustic emissions technique) (81).

Weichbold et. al. studied the impact of information on maternal attitude toward universal neonatal hearing screening. They found that the great majority of mothers (84%) were advocated to universal neonatal hearing screening and mothers who are informed about their babies hearing test are more likely to have a positive attitude towards hearing screening than mothers who are not informed (82).

In conclusion, the majority of parents had positive attitude towards universal neonatal hearing screening. They were advocated it, and they considered the hearing screening worthwhile to their babies. They wanted early detection of hearing loss and early intervention, if their babies had hearing loss.

2.5 Factor underlying parent's attitudes

Educational level: Highly educated person is easier to communicate and understand information (72). Education enhances mother's cognitive development, highly educated mothers usually have a chance for seeking knowledge, problem solving technique and resource to cope with the critical events. Year of education is a crucial factor influencing an individual's ability to develop intellectually, which is very important to them adaptation (73). Weichbold (61) examined mother attitudes toward hearing screening. Using a standardized interview, 40 mothers were questioned. Results indicated that 38 of mothers knew about this type of health check, mothers who were informed about their baby's hearing test were more likely to have a positive attitude towards hearing screening than mothers who were not informed. These findings supported the view that providing information about the hearing test will positively affect parental attitude towards universal neonatal hearing screening.

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CHAPTER 3

MATERIALS AND METHODS

This research was conducted to describe anxiety and attitudes in parents who participated in the neonatal hearing screening program, and factors underlying parent's anxiety and attitudes to neonatal hearing screening program.

3.1 Subjects

The subjects for this study were 383 parents of newborn delivered and received hearing screening by TEOAEs at maternal unit, Songkhla Hospital and Hatyai Hospital. The sample were selected by the following inclusion criteria:

1.Thai nation.

2. Ability to read and write Thai language.

3. Subject permission.

Data were collected at maternal unit of Songkhla Hospital and Hatyai Hospital, Songkhla, Thailand, in 1-30 September 2001.

3.2 Instrumentation

1)Demographic Data Questionnaires were constructed to obtain some basic personal information such as age, educational level, religion, domicile, occupation, family income, gravida and delivery, number of term birth, number of living child, family history (Appendix B).

2) Seven 'yes-no' questions measuring parental anxiety to neonatal hearing screening and severity (Appendix B).

3) Twelve 'yes-no' questions measuring parental attitude to neonatal hearing screening (Appendix B).

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3.3 Validity testing

The questionnaires were validated by 3 experts: including neuropsychological physician, audiologist and speech and language pathologist. After that, the pilot study with 50 parents was done for the improvement of the questionnaires before the experimental study.

3.4 Procedures

The objectives of the study and the knowledge about neonatal hearing screening were provided to every subjects before completion of the questionnaires. Parents of all newborn completed the questionnaires after neonatal hearing screening.

3.5 Data analysis

The statistical package SPSS for Windows version 10.0 was used for data analysis shown as follows:

1. Number and percentage of data were applied for presenting the personal data, maternal attitudes and anxiety toward newborn hearing screening program.

2. Chi-square method was applied for determining the relationship between factors of sex, age, educational level, occupation, family income, gestational age, type of labour, birth weight of newborn, gravidar, number of sibling, history of hearing loss in family, consanguineous marriage with parental anxiety and attitudes to neonatal hearing screening.

3. Z-test was used in determining the difference of two proportion between person factors and parental attitudes to neonatal hearing screening.

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CHAPTER 4
RESULTS

The purpose of this study was to describe parental anxiety and attitudes toward the neonatal hearing screening program. The results of the study will be presented as follows; demographic characteristics of the subjects, parental anxiety toward neonatal hearing screening program and parental attitudes toward the neonatal hearing screening program.

4.1 Demographic characteristics of the subjects

The demographic characteristics of subjects were presented in Table 1. The subjects consisted of 383 parents whose newborns were included in the neonatal hearing screening program. Of 383 subjects, 327 subjects (85.4%) were mother, and 56 subjects (14.6%) were father.

For homeland, 355 subjects (92.6%) were from the southern part of Thailand, 15 subjects (3.9%) were from the middle part of Thailand, 6 subjects (1.6%) were from the northern part of Thailand, 5 subjects (1.3%) were from the northeastern part of Thailand, one subject (0.3%) was from the eastern part of Thailand, and one subject (0.3%) was from the western part of Thailand.

For address, 379 subjects (98.9%) were from the southern part of Thailand, 2 subjects (0.5%) were from the middle part of Thailand, one subject (0.3%) was from the northern part of Thailand, and one subject (0.3%) was from the eastern part of Thailand.

The age of 216 subjects (56.4%) were between 25-35 years old, 141 subjects (36.8%) were between 14-24 years old, and 26 subjects (6.8%) were between 36-46 years old.

For educational level, 170 subjects (44.4%) graduated primary level, 150 subjects (39.2%) in secondary level, 39 subjects (10.1%) in diploma level, 18 subjects (4.7%) in bachelor level, and 6 subjects (1.6%) were illiterate.

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For occupation, 165 subjects (43.0%) were employees, 144 subjects (37.6%) were housewives, 42 subjects (11.0%) were salespersons, 26 subjects (6.8%) were agriculturists, and 6 subjects (1.6%) were civil servants and state enterprise workers.

Income of 250 subjects (65.3%) was less than 5,000 baht a month, 92 subjects (24.0%) ranged from 5,000-10,000 baht a month, 31 subjects (8.1%) ranged from 10,001-15,000 baht a month, and 9 subjects (2.3%) earned more than 15,000 baht a month, and 1 subject (0.3%) did not answer this question.

For antenatal care, 374 subjects (97.6%) had been taken care by antenatal care system during pregnancy, and 8 subjects (2.1%) had not been taken care by antenatal care system during pregnancy, and 1 subject (0.3%) did not answer this question.

For pregnancy, 382 subjects (99.7%) were normal pregnancy, only one subject (0.3%) was In Vitro Fertilization (IVF) program.

Gestational ages of 357 subjects (93.2%) were between 36-40 weeks, 24 subjects (6.3%) were between 31-35 weeks, and 2 subjects (0.5%) were more than 40 weeks.

For complication during pregnancy, 323 mothers (84.3%) had no complication during pregnancy, 56 mothers (14.6%) had minor complication during pregnancy, and 3 mothers (0.8%) had high risk complication, and 1 subject (0.3%) did not answer this question. Of 3 mothers, they had kidney abscess, probably from receiving antibiotic treatment for kidney abscess.

For type of deliver, 274 mothers (71.5%) delivered by normal labour, and 109 mothers (28.5%) delivered by abnormal labour. Of 109 mothers, 98 mothers were performed cesarean section, 8 mothers were performed vacuum extraction, 3 mothers were performed forceps extraction.

The birth weight of 157 newborns (41.0%) ranged between 3,001-3,500 grams, 157 newborns (41.0%) ranged between 2,501-3,000 grams, 50 newborns (13.0%) weighted more than 3,500 grams, 19 newborns (5.0%) ranged between 2,001-2,500 grams.

For gravidarum, 237 subjects (61.9%) had multigravidar, and 146 subjects (38.1%) had primigravidar.

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Number of sibling, 147 subjects (38.4%) have one child, 148 subjects (38.6%) have two children, 88 subjects (23.0%) have 3-7 children.

For history of hearing loss in family, 357 subjects (93.2%) had no history of hearing loss in family, while 26 subjects (6.8%) had history of hearing loss in family.

For consanguineous marriage, 32 subjects (8.4%) had a history of consanguineous marriage, while 351 subjects (91.6%) had no history of consanguineous marriage.

Table 1. Number and percentage of demographic characteristics of the subjects

Characteristic of subjects	Number	Percentage
Total	383	100
Gender		
Male	56	14.6
Female	327	85.4
Homeland		
Southern part of Thailand	355	92.6
Northern part of Thailand	6	1.6
Middle part of Thailand	15	3.9
Northeastern part of Thailand	5	1.3
Eastern part of Thailand	1	0.3
Western part of Thailand	1	0.3
Address		
Southern part of Thailand	379	98.9
Northern part of Thailand	1	0.3
Middle part of Thailand	2	0.5
Eastern part of Thailand	1	0.3
Age		
14 – 24 years	141	36.8
25 – 35 years	216	56.4
36 – 46 years	26	6.8

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Table 1. Number and percentage of demographic characteristics of the subjects (continued)

Characteristic of subjects	Number	Percentage
Educational level		
Illiterate	6	1.6
Primary level	170	44.4
Secondary level	150	39.2
Diploma level	39	10.1
Bachelor level	18	4.7
Occupation		
Housewives	144	37.6
Employees	165	43.0
Salespersons	42	11.0
Agriculturists	26	6.8
Civil servants and state enterprise workers	6	1.6
Income		
< 5,000 baht a month	250	65.3
5,000 – 10,000 baht a month	92	24.0
10,001 – 15,000 baht a month	31	8.1
> 15,000 baht a month	9	2.3
Not answer	1	0.3
Antenatal care		
Antenatal care	374	97.6
No antenatal care	8	2.1
Not answer	1	0.3
Pregnancy		
Normal pregnancy	382	99.7
In Vitro Fertilization	1	0.3

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Table 1. Number and percentage of demographic characteristics of the subjects (continued)

Characteristic of subjects	Number	Percentage
Gestational age(weeks)		
31 – 35	24	6.3
36 – 40	357	93.2
> 40	2	0.5
Complication during pregnancy		
Had minor complication	56	14.6
Had high risk complication	3	0.8
Healthy	323	84.3
Not answer	1	0.3
Type of deliver		
Normal labour	274	71.5
Abnormal labour	109	28.5
Birth weight(grams)		
2,001 – 2,500	19	5.0
2,501 – 3,000	157	41.0
3,001 – 3,500	157	41.0
> 3,500	50	13.0
Gravidar		
Primigravidar	146	38.1
Multigravidar	237	61.9
Sibling		
1	147	38.4
2	148	38.6
≥ 3	88	23.0
History of hearing loss in family		
Yes	26	6.8
No	357	93.2
Consanguineous marriage		
Yes	32	8.4
No	351	91.6

n = 383

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4.2 Did parents have anxiety to neonatal hearing screening program? If yes, How much was severity?

In this part, 383 parents answered 7 questions related to anxiety to neonatal hearing screening. The results were presented in Table 2.

Question number 1. Did the hearing screening that your baby has just received make you feel worried?

One hundred and ninety-two parents (50.1%) reported that they felt anxious when the hearing screening was administered to their babies; while 191 parents (49.9%) reported that they did not feel anxious.

Question number 2. How did you feel when you were worried?

One hundred and fifty-two parents (39.7%) reported that they felt fear when they were worried. Ninety-seven parents (25.3%) felt anxious. Thirty-four parents (8.9%) were excited. Ten parents (2.6%) felt hot or cold flashes. Seven parents (1.8%) felt tachycardia. Three parents (0.8%) felt headache. One parent (0.3%) felt nausea and vomiting.

Question number 3. Were you worried when the result of hearing screening showed "not pass" or "not recorded"?

Three hundred and ten parents (80.9%) reported that they felt anxious when the results of their babies hearing screening showed "not pass" or "not recorded", while 72 parents (18.8%) did not feel at all worried. One parent (0.3%) did not answer this question.

Question number 4. Would you follow up when the result of hearing screening showed "not pass"?

Three hundred and seventy-six parents (98.2%) reported that they would follow up when their babies did not pass the hearing screening; while 7 parents (1.8%) would not follow up.

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Question number 5. Were you worried when the hearing screening would be administered to your baby at retest?

Two hundred and sixty-eight parents (70.0%) reported that they felt anxious when their babies would be administered screening test at retest; while 115 parents (30.0%) reported that they did not concern.

Question number 6. Did you have difficulty to take your baby to hospital for retest of the hearing screening test?

Two hundred and eighty-eight parents (75.2%) reported that they had no difficulty to come to the hospital when their babies would be administered the hearing screening; but 95 parents (24.8%) reported that they had difficulty to take their babies to the hospital when their babies would be administered the hearing screening.

Question number 7. Would you take your baby to another hospital for treatment when your baby did not pass the hearing screening?

Two hundred and eighty-seven parents (74.9%) reported that they would not take their babies to another hospital for treatment when their babies did not pass the hearing screening; but ninety-six parents (25.1%) reported that they would take their babies to another hospital.

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Table 2. Number and percentage of subjects according to anxiety to neonatal hearing screening.

Item	Number	percentage
1. Did the hearing screening that your baby has just received make you feel worried?		
Yes	192	50.1
No	191	49.9
2. How did you feel when you were worried?		
Fear	152	39.7
Anxious	97	25.3
Excited	34	8.9
Hot or cold flashes	10	2.6
Tachycardia	7	1.8
Headache	3	0.8
Nausea and vomiting	1	0.3
3. Were you worried when the result of hearing screening showed “not pass” or “not recorded”?		
Yes	310	80.9
No	72	18.8
Not answer	1	0.3
4. Would you follow up when the result of hearing screening showed “not pass”?		
Yes	376	98.2
No	7	1.8
5. Were you worried when the hearing screening would be administered to your baby at retest?		
Yes	268	70.0
No	115	30.0

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Table 2. Number and percentage of subjects according to anxiety to neonatal hearing screening.(continued)

Item	Number	percentage
6. Did you have difficulty to take your baby to the hospital for retest of the hearing screening test?		
Yes	95	24.8
No	288	75.2
7. Would you take your baby to another hospital for treatment when your baby did not pass the hearing screening test?		
Yes	96	25.1
No	287	74.9

Table 3 showed number and percentage of subjects in degree of anxiety to neonatal hearing screening. One hundred and ninety-one parents (49.9%) did not feel worried. In 192 parents (50.1%) felt worried, 168 parents (43.84%) were hardly worried, 23 parents (6.00%) were fairly worried, and one parent (0.26%) was very worried.

Table 3. Number and percentage of subjects in degree of anxiety to neonatal hearing screening.

Degree of anxiety	Number	Percentage
Not worried	191	49.90
Hardly worried	168	43.84
Fairly worried	23	6.00
Very worried	1	0.26
Total	383	100.00

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4.3 What were the important factors related to parental anxiety to neonatal hearing screening program?

Table 4 showed the relationship between parental anxiety and personal profile. In summary, the results showed that consanguineous marriage had a significant relationship with parental anxiety to neonatal hearing screening at p-value < .05. It revealed that 22/32 parents (68.75%) with history of consanguineous marriage were more anxious than 170/351 parents (48.43%) with no history of consanguineous marriage (see Appendix A, Table A-1, page 1-3).

Table 4. The relationship between parental anxiety and personal data using Chi-square method.

Personal factors	χ^2	p-value
Sex of parents	2.153	.142
Age	.080	.961
Educational level	2.638	.267
Occupation	3.176	.529
Income	1.044	.593
Gestational age	2.029	.154
Complication during pregnancy	.020	.887
Type of labour	.258	.593
Birth weight of newborn	.209	.648
Gravida	.029	.865
Number of sibling	2.168	.338
History of hearing loss in family	.176	.674
Consanguineous marriage	4.842*	.028

* significant at p-value < .05

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4.4 What were the parental attitudes and suggestions to neonatal hearing screening program?

4.4.1 Parental attitudes to neonatal hearing screening program.

In this part, 383 parents answered 12 questions related to attitudes toward neonatal hearing screening. The results were presented in Table 5.

Question number 1. Would you consent the hearing screening test in your baby?

Three hundred and eighty-one parents (99.4%) reported that they would consent hearing screening in their babies; but 1 parent (0.3%) would not, and 1 parent (0.3%) did not answer this question.

Question number 2. Did you think that all infants should receive the hearing screening test?

Three hundred and seventy-six parents (98.2%) reported that they thought all infants should receive the hearing screening test, but 5 parents (1.3%) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 3. Did you believe that infant with hearing loss would have communication problems?

Three hundred and fourty-seven parents (90.6%) reported that they believed if infant had hearing loss, he would have communication problems, but 34 parents (8.9%) did not believe, and 2 parents (0.5%) did not answer this question.

Question number 4. Did you think that hearing screening effected to you unnecessary worry?

Of 383 parents, 111 parents (29.0%) thought that the hearing screening were effected to them unnecessary worry, but 270 parents (70.5%) did not think so, and 2 parents (0.5%) did not answer this question.

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Question number 5. Did you think that hearing screening program was useful for infants?

Three hundred and seventy-six parents (98.2 %) thought that the hearing screening was useful for infants, but 5 parents (1.3 %) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 6. Did you believe that the hearing screening was waste and loss of time?

Thirty-eight parents (9.9%) thought that the hearing screening was waste and loss of time, but 343 parents (89.6%) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 7. Did you think that the hearing screening was dangerous to infants?

Thirty-seven parents (9.7%) thought that the hearing screening was dangerous to infants, but 344 parents (89.8%) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 8. Did you believe that given information about the hearing screening test was necessary for parents?

Three hundred and sixty-four parents (95.0%) thought that given information about hearing screening was necessary for parents, but 17 parents (4.4%) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 9. Did you believe that the hearing screening test could bring to a diagnosis if infant had hearing loss?

Two hundred and ninety-two parents (76.2%) believed that the hearing screening could bring to a diagnosis if infant had hearing loss, but 89 parents (23.2%) did not believe, and 2 parents (0.5%) did not answer this question.

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Question number 10. Did you believe that the infant should receive the early treatment if the infant had hearing loss?

Three hundred and sixty-five parents (95.3%) believed that the infant should receive the early treatment if the infant had hearing loss, but 17 parents (4.4%) did not believe, and 1 parent (0.3%) did not answer this question.

Question number 11. Did you think that infant who did not pass the hearing screening should be retested within 1-2 months?

Three hundred and fifty-three parents (92.2%) thought that infants should be administered hearing screening within 1-2 months if their babies did not pass the hearing screening, but 28 parents (7.3%) did not think so, and 2 parents (0.5%) did not answer this question.

Question number 12 Did you believe that the detection of hearing loss in infants before age 6 months and the early intervention could improve speech and language development?

Three hundred and sixty-eight parents (96.1%) believed that the detection of hearing loss in infants before age 6 months and the early intervention could improve speech and language development, but 13 parents (3.4%) did not believe, and 2 parents (0.5%) did not answer this question.

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Table 5. Number and percentage of subjects in attitudes to neonatal hearing screening.

Item	Yes		No		Not answer	
	n	%	n	%	n	%
1. Would you consent the hearing screening test in your baby?	381	99.4	1	0.3	1	0.3
2. Did you think that all infants should receive the hearing screening test?	376	98.2	5	1.3	2	0.5
3. Did you believe that infant with hearing loss would have communication problems?	347	90.6	34	8.9	2	0.5
4. Did you think that hearing screening effected to you unnecessary worry?	111	29.0	270	70.5	2	0.5
5. Did you think that hearing screening program was useful for infants?	376	98.2	5	1.3	2	0.5
6. Did you believe that hearing screening was waste and loss of time?	38	9.9	343	89.6	2	0.5
7. Did you think that the hearing screening was dangerous to infants?	37	9.7	344	89.8	2	0.5

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Table 5. Number and percentage of subjects in attitude to neonatal hearing screening. (continued)

Item	Yes		No		Not answer	
	n	%	n	%	n	%
8. Did you believe that given information about hearing screening test was necessary for parents?	364	95.0	17	4.4	2	0.5
9. Did you believe that the hearing screening test could bring to a diagnosis if infant had hearing loss?	292	76.2	89	23.2	2	0.5
10. Did you believe that the infant should receive the early treatment if the infant had hearing loss?	365	95.3	17	4.4	1	0.3
11. Did you think that infant who did not pass the hearing screening should be retested within 1-2 months?	353	92.2	28	7.3	2	0.5
12. Did you believe that the detection of hearing loss in infants before age 6 months and the early intervention could improve speech and language development?	368	96.1	13	3.4	2	0.5

n = 383

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4.4.2 Parental suggestions to neonatal hearing screening program.

This research also asked the parents to offer their suggestions concerning neonatal hearing screening program. They were encouraged to write down their comments at the end of the questionnaire. Only 31 (8.09%) parents wrote their suggestions. Twenty-four (6.26%) respondents supported the neonatal hearing screening program. Two (0.52%) parents suggested that the screener should inform the advantage and disadvantage more concerning neonatal hearing screening program. Two (0.52%) parents suggested that the expenses of the neonatal hearing screening program should not be too high if they had to pay. One (0.26%) parent suggested that there should be a demonstration of hearing screening before the actual test administration on the baby. One (0.26%) parent suggested that the test should be conducted on the baby at the age of 1-2 months old. One (0.26%) parent suggested that the neonatal hearing screening program should be implemented to only the parents who voluntarily agreed to have their babies screened.

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4.5 Which factors were related to parental attitudes to neonatal hearing screening program?

Parents answered 12 questions related to attitudes to neonatal hearing screening. The relationship between parental attitudes and personal factors including: sex, age, educational level, occupation, family income, gestational age, complication during pregnancy, type of deliver, birth weight of newborn, gravida, number of sibling, history of hearing loss in family, and consanguineous marriage was analyzed by using the Chi-square test, and the difference of two proportion between parental attitudes and personal factors was analyzed by using Z-test. The results were presented in Table 6.

In parental attitude question number 6, the result showed that birth weight of newborn had significant relationship with parental attitude question number 6 at p-value < .05. It revealed that 164/174 parents (94.25%) who had children with birth weight of newborn 3,000 grams or less than 3,000 grams showed more positive attitude than 179/207 parents (86.47%) who had children with birth weight of newborn more than 3,000 grams. In addition, the result showed that number of sibling had significant relationship with parental attitude question number 6 at p-value < .05. It revealed that 140/147 parents (95.23%) who had 2 children showed more positive attitude than 128/146 parents (87.67%) who had one child and 75/88 parents (85.22%) who had 3 or more than 3 children (see Appendix A, Table A-7, page 20-21).

In parental attitude question number 7, the result showed that gender of subjects had significant relationship with parental attitude question number 7 at p-value < .01. It revealed that 299/325 mothers (92.0%) showed more positive attitude than 45/56 fathers (80.36%). In addition, the result showed that birth weight of newborn had significant relationship with parental attitude question number 7 at p-value < .05. It revealed that 163/174 parents (93.67%) who had children with birth weight of newborn 3,000 grams or less than 3,000 grams showed more positive attitude than 181/207 parents (87.44%) who had children with birth weight of newborn more than 3,000 grams. And, the result showed that number of sibling had significant relationship with parental attitude question number 7 at p-value .05. It revealed that 140/147 parents (95.24%) who had 2 children showed more positive attitude than

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130/146 parents (89.04%) who had one child and 74/88 parents (84.09%) who had 3 or more than 3 children (see Appendix A, Table A-8, page 22-24).

The results showed no significant relationship in the followings, parental attitude question number 2 and personal factors (age, educational level, and number of sibling, parental attitude question number 3 and personal factors (age, educational level, income, gestational age, complication during pregnancy, type of deliver, birth weight of newborn, and number of sibling), parental attitude question number 4 and personal factors (sex, age, educational level, occupation, income, gestational age, complication during pregnancy, type of deliver, birth weight of newborn, gravida, number of sibling, history of hearing loss in family, and consanguineous marriage), parental attitude question number 5 and personal factors (educational level, and number of sibling), parental attitude question number 6 and personal factors (age, educational level, income, gestational age, complication during pregnancy, type of deliver, and gravida), parental attitude question number 7 and personal factors (age, educational level, income, gestational age, complication during pregnancy, type of deliver, and gravida), parental attitude question number 8 and personal factors (educational level, income, gestational age, birth weight of newborn, gravida, and number of sibling), parental attitude question number 9 and personal factors (sex, age, educational level, occupation, family income, gestational age, complication during pregnancy, type of deliver, birth weight of newborn, gravida, number of sibling, history of hearing loss in family, and consanguineous marriage), parental attitude question number 10 and personal factors (age, educational level, gestational age, type of deliver, birth weight of newborn, gravida, and number of sibling), parental attitude question number 11 and personal factors (sex, age, educational level, occupation, income, gestational age, type of deliver, birth weight of newborn, gravida, and number of sibling), parental attitude question number 12 and personal factors (age, educational level, income, gestational age, birth weight of newborn, and number of sibling).

Some variables could not be analyzed by the Chi-square and Z-test because of the raw data in some columns of the relationship between parental attitudes and personal factors were zero. These questions included parental attitude question number 1 and all personal factors, parental attitude question number 2 and personal factors (occupation, income, history of hearing loss in family, and consanguineous marriage),

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parental attitude question number 3 and personal factor (occupation), parental attitude question number 5 and personal factors (sex of parents, age, occupation, income, complication during pregnancy, history of hearing loss in family, and consanguineous marriage), parental attitude question number 7 and personal factor (occupation), parental attitude question number 8 and personal factors (age, occupation, and consanguineous marriage), parental attitude question number 10 and personal factors (occupation and income), parental attitude question number 12 and personal factors (occupation, complication during pregnancy, history of hearing loss in family, and consanguineous marriage). (see in appendix A, Table A-2, Table A-3, Table A-4, Table A-6, Table A-8, Table A-9, Table A-11, and Table A-13)

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.

Personal factors	Attitude questions							
	No.1 Would you consent the hearing screening test in your baby?				No.2 Did you think that all infants should receive the hearing screening test?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	-	-	-	-	-	-	-	-
Age	-	-	-	-	3.226	.199	-	-
Educational level	-	-	-	-	1.365	.505	-	-
Occupation	-	-	-	-	-	-	-	-
Income	-	-	-	-	-	-	-	-
Gestational age	-	-	-	-	-	-	.87	.192
Complication during pregnancy	-	-	-	-	-	-	-1.54	.438
Type of deliver	-	-	-	-	-	-	1.90	.028
Birth weight of newborn	-	-	-	-	-	-	-0.65	.242
Gravida	-	-	-	-	-	-	.83	.203
Number of sibling	-	-	-	-	1.067	.587	-	-
History of hearing loss in family	-	-	-	-	-	-	-	-
Consanguineous marriage	-	-	-	-	-	-	-	-

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.(continued)

Personal factors	Attitude questions							
	No.3 Did you believe that infants with hearing loss would have communication problems?				No.4 Did you think that hearing screening effected to you unnecessary worry?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	-	-	.511	.305	.175	.675	-	-
Age	2.116	.347	-	-	4.285	.117	-	-
Educational level	.212	.899	-	-	3.034	.219	-	-
Occupation	-	-	-	-	1.472	.832	-	-
Income	.203	.903	-	-	3.544	.170	-	-
Gestational age	1.860	.173	-	-	.688	.407	-	-
Complication during pregnancy	.164	.685	-	-	.145	.703	-	-
Type of deliver	1.694	.193	-	-	.004	.951	-	-
Birth weight of newborn	.304	.582	-	-	.025	.875	-	-
Gravida	2.126	.145	-	-	.166	.683	-	-
Number of sibling	2.247	.325	-	-	.188	.910	-	-
History of hearing loss in family	-	-	-0.48	.184	1.176	.278	-	-
Consanguineous marriage	-	-	1.15	.125	.000	.990	-	-

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.(continued)

Personal factors	Attitude questions							
	No.5 Did you think that hearing screening program was useful for infants?				No.6 Did you believe that hearing screening was waste and loss of time?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	-	-	-	-	-	-	1.247	.105
Age	-	-	-	-	3.679	.159	-	-
Educational level	.797	.671	-	-	2.569	.277	-	-
Occupation	-	-	-	-	1.973	.741	-	-
Income	-	-	-	-	2.956	.228	-	-
Gestational age	-	-	.887	.189	3.242	.072	-	-
Complication during pregnancy	-	-	-	-	.009	.924	-	-
Type of deliver	-	-	-	-	.648	.421	-	-
Birth weight of newborn	-	-	-0.15	.059	6.372*	.012	-	-
Gravida	-	-	.214	.416	1.552	.213	-	-
Number of sibling	1.067	.587	-	-	7.606*	.022	-	-
History of hearing loss in family	-	-	-	-	-	-	-0.13	0.051
Consanguineous marriage	-	-	-	-	-	-	.67	0.248

*significant at p-value < .05

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.(continued)

Personal factors	Attitude questions							
	No.7 Did you think that the hearing screening was dangerous to infants?				No.8 Did you believe that given information about hearing screening test was necessary for parents?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	7.385**	.007	-	-	-	-	1.04	.149
Age	1.57	.456	-	-	-	-	-	-
Educational level	4.492	.105	-	-	2.84	.242	-	-
Occupation	-	-	-	-	-	-	-	-
Income	1.179	.555	-	-	3.292	.193	-	-
Gestational age	1.567	.211	-	-	0.032	.858	-	-
Complication during pregnancy	.061	.806	-	-	-	-	1.023	.154
Type of deliver	.025	.874	-	-	-	-	-2.146	.483
Birth weight of newborn	4.196*	.041	-	-	.145	.704	-	-
Gravida	.467	.494	-	-	.564	.453	-	-
Number of sibling	8.221*	.016	-	-	1.564	.457	-	-
History of hearing loss in family	-	-	-0.32	.125	-	-	-0.81	.291
Consanguineous marriage	-	-	.0072	.50	-	-	-	-

*significant at p-value < .05

** significant at p-value < .01

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.(continued)

Personal factors	Attitude questions							
	No.9 Did you believe that the hearing screening test could bring to a diagnosis if infant had hearing loss?				No.10 Did you believe that infant should receive the early treatment if the infant had hearing loss?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	1.11	.292	-	-	-	-	1.040	.149
Age	2.075	.354	-	-	.048	.976	-	-
Educational level	1.789	.409	-	-	4.621	.099	-	-
Occupation	5.827	.212	-	-	-	-	-	-
Income	3.908	.142	-	-	-	-	-	-
Gestational age	0.002	.962	-	-	.453	.501	-	-
Complication during pregnancy	.285	.594	-	-	-	-	-0.24	.094
Type of deliver	.899	.343	-	-	.007	.935	-	-
Birth weight of newborn	.414	.520	-	-	.016	.898	-	-
Gravida	1.476	.224	-	-	.552	.458	-	-
Number of sibling	1.639	.441	-	-	1.576	.455	-	-
History of hearing loss in family	.198	.656	-	-	-	-	-0.88	.310
Consanguineous marriage	1.493	.222	-	-	-	-	-0.57	.215

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Table 6. The relationship between parental attitudes and personal factors by using Chi-square method and the difference of two proportion between parental attitudes and personal factors by using Z-test.(continued)

Personal factors	Attitude question							
	No.11 Did you think that infant who did not pass the hearing screening should be retested within 1-2 months?				No.12 Did you believe that the detection of hearing loss in infants before age 6 months and the early intervention could improve speech and language development?			
	$\chi 2$	p-value	Z-test	p-value	$\chi 2$	p-value	Z-test	p-value
Sex of parents	1.092	.296	-	-	-	-	.73	.232
Age	2.436	.296	-	-	1.856	.395	-	-
Educational level	.88	.644	-	-	3.019	.221	-	-
Occupation	5.38	.25	-	-	-	-	-	-
Income	1.272	.529	-	-	.767	.681	-	-
Gestational age	.000	.984	-	-	1.228	.268	-	-
Complication during pregnancy	-	-	0.75	0.226	-	-	-	-
Type of deliver	.193	.661	-	-	-	-	-0.98	.336
Birth weight of newborn	.496	.481	-	-	.363	.547	-	-
Gravida	3.085	.079	-	-	-	-	.421	.337
Number of sibling	2.979	.226	-	-	.543	.762	-	-
History of hearing loss in family	-	-	-0.68	.251	-	-	-	-
Consanguineous marriage	-	-	-0.51	.194	-	-	-	-

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CHAPTER 5
DISCUSSION AND CONCLUSION

This study was conducted to investigate the parental anxiety and attitudes to neonatal hearing screening. The discussion of this study was presented according to the following topics: parental anxiety to the neonatal hearing screening, the relationship between parental anxiety and their personal profile, parental attitudes to the neonatal hearing screening, the relationship between parental attitudes to personal profile, and parental suggestion to the neonatal hearing screening.

5.1 Parental anxiety to the neonatal hearing screening

Parental anxiety was investigated by using questionnaires with parents of neonate receiving hearing screening. Most parents (85.4%) were mothers of which 61.9 % of them were multigravida (Table 1). From Table 2, question number 1, 191 (49.9%) of 383 parents were not at all worried, and 192 (50.1%) were worried when the hearing screening was administered to their babies. Of 192 parents, 168 parents (43.84%) were hardly worried and 24 parents (6.26%) were very worried. This study agreed with the study of Weichbold and Welzl-Muller (62), which showed that most mothers (59%) were not at all worried about the neonatal hearing screening program. In study of Weichbold and Welzl-Muller, they were given the information about the hearing screening only to interested mothers. In contrast, this study disagreed with the studies of Watkin et. al.(58), and Weichbold and Welzl-Muller(62). In the study of Watkin et. al.(58), who studied maternal anxiety to neonatal hearing screening, the results showed that the majority of mothers (70%) were not at all worried, 23 % mothers were hardly worried, and 5 % mothers were very worried. In the study of Watkin et. al., mothers were given a leaflet that explained the test and the reasons for screening the hearing at this age. Ninety-two percent of mothers were satisfied or very satisfied with the explanation of the hearing screening. In addition, mothers were

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invited to accompany their babies during hearing test and the results were term TEOAEs “recorded” or “not recorded” without using the words “pass” or “fail”. Moreover, two-thirds of mothers (66.67%) had some knowledge of deafness gained through the media and 43.75 % of mothers had personal contact with a hearing impaired person. In the study of Weichbold and Welzl-Muller (62), who studied maternal anxiety about positive test results in universal newborn hearing screening. The result showed that 14 % of mothers were highly worried because mothers did not have a chance to attend their infant testings. In this present study, mothers were invited to accompany their babies during hearing test, and mothers were given a leaflet about neonatal hearing screening. However, their babies were taken away from the mothers and some mothers did not attend during hearing test because they had postpartum pain or fatigue, 98 mothers had been performed cesarean section. Moreover, twenty-two parents (5.74%) were worried because they had consanguineous marriage, they might know risk factors about deafness from the given leaflet. In summary, parental anxieties accompany with their babies associated with lack of information about newborn hearing screening and did not attend during hearing testing (61).

5.2 The relationship between parental anxiety and their personal profiles

From Table 4, the results showed that 22/32 parents (68.75%) with history of consanguineous marriage were worried while in parents with no history of consanguineous marriage, 170/351 parents (48.43%) were worried when the hearing screening would be administered to their babies. This finding indicated that the parents with history of consanguineous marriage showed more percentage of anxiety than the parents with no history of consanguineous marriage ($p<0.05$). Knowledge of risk factors might be one of reason of parental anxiety. This study cannot be compared with other research finding since there have not been any investigations on this topic at the time of this research.

However, other personal profiles: gender of parent, age, educational level, occupation, income, gestational age, complication during pregnancy, type of deliver,

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birth weight of newborn, gravida, number of siblings, and history of hearing loss in family, were not significantly related to parental anxiety.

5.3 Parental attitudes to the neonatal hearing screening program.

According to parental attitudes to the neonatal hearing screening as shown in Table 4, the results indicated that majority of the respondents (76.2%-99.5%) expressed positive attitudes to the neonatal hearing screening program. The results of this research agreed with those of Luterman and Kurtzer-White (3), Watkin et.al.(80), Hergils and Hergils (81), Weichbold et.al. (82), Zhao PJ. Et. al. (87). In the study of Luterman and Kurtzer-White (3), they studied the views of parents with children who were deaf or had hearing loss about their needs during the identification process. The results showed that 83% of mothers supported early identification of hearing loss. In the study of Watkin et. al. (80), they studied the views of parents of hearing impaired children on the need for neonatal hearing screening. The results showed that 79.80 % of parents would have welcomed the neonatal hearing screening test. In the study of Hergils and Hergils (81), they studied the parental attitudes and concerns in relation to universal neonatal hearing screening by otoacoustic emissions (OAEs). The results showed that 95 % of the parents had a positive attitude toward neonatal hearing screening. In the study of Weichbold et.al. (82), they studied the impact of information on maternal attitudes towards universal neonatal hearing screening. The results showed that 84 % of mothers advocated the universal neonatal hearing screening. In the study of Zhao PJ. Et. al. (87), they studied the parents opinions on screening program regarding newborn hearing. The results showed that 93.06 % of the parents had a positive attitude to the screening after being informed of the test.

In the present study, the majority of parents (99.4%) reported that they would consent the hearing screening test to their babies. The majority of parents thought that all infants should receive the hearing screening test (98.2%), the hearing screening test to be useful for infants (89.6%), and infants should be administered hearing screening within 1-2 months if their babies did not pass the hearing screening (92.2%). The majority of parents believed that infants with hearing loss would have communication problems (90.6%). Therefore, they thought that given information about hearing

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screening test was necessary for parents (95%). The majority of parents believed that the hearing screening could bring to a diagnosis if infant had hearing loss (76.2%), infants should receive the early treatment (95.3%), and the detection of hearing loss in infant before age 6 months and the early intervention could improve speech and language development (96.1%).

Some of these findings were agreed with the study of Weichbold and Welzl-Muller (61), Watkin et.al. (58), Moulin et. al. (85), Luterman and Kurtzer (3). In the study of Weichbold and Welzl-Muller (61), whose results showed that 82.5 % of mothers were consented the hearing screening test to their babies. They concluded that parents receiving enough information about hearing screening might be a reason. In the study of Watkin et.al. (58), they studied parental anxiety and attitudes to UNHS. The results showed that 97 % of mothers considered the hearing screening to be worthwhile, and 92 % of mothers were satisfied or very satisfied with the explanation of the screening. In the study of Moulin et. al. (85), they studied parental attitudes towards a hearing screening program using evoked otoacoustic emissions. The results showed that more than 92 % of parents judged the test as being useful. In the study of Luterman and Kurtzer (3), they found that 82 % of parents indicated the need for information and compassion on the part of the audiologist, and parents wanted unbiased information, particularly concerning the issue of communication and education methodology. As well as, they wanted to know hearing test result and to begin the process of education their babies early if their babies were deaf or had hearing loss.

However, from the present study, some parents (29.0%) thought that the hearing screening were effected them unnecessary worry, small group of parents (10.44%) considered the hearing screening were waste and loss of time, and some (9.7%) thought that the hearing screening were dangerous to infants.

These findings were disagreed with the study of Watkin et. al. (58), which showed that 7.8 % of mothers considered the screen made the parents worried unnecessarily, and 1.4 % of mothers considered the hearing screening test were waste of taxpayer money. In contrast, in the study of Watkin et. al. (58), two-thirds of the mothers had some knowledge of deafness gained through the media and 43.75 % of

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the mothers had personal contact with a hearing impaired person. Thus, the mothers in the study of Watkin et. al. had more positive attitude than those in this study.

In summary, most parents had positive attitudes to UNHS. In addition sufficient information was given, parents positive attitudes might be increased. The positive attitudes towards hearing screening were associated with knowledge about the test. The parents needed individual counseling and support during the time of audiological assessment and a plan for future action (59, 61).

5.4 The relationship between parental attitudes and their personal profiles

From Table 5, question number 6, the results showed that 28/207 parents (13.52 %) whose newborns weighed more than 3,000 grams and 10/174 parents (5.74 %) whose newborns weighed 3,000 grams or less believed that the hearing screenings were wasted and loss of time. In addition, the results showed that 18/146 parents (12.33 %) who had one child, 7/174 parents who had 2 children, and 13/88 parents (17.33 %) who had 3 or more children believed that the hearing screenings were wasted and loss of time. This finding showed that the parents whose babies weighed 3,000 grams or less than 3,000 grams had more positive attitude than the parents whose babies weighed more than 3,000 grams, and parents who had 2 children showed more positive attitude than those who had one child and those who had 3 or more children ($p<0.05$).

These findings could be implied that the mothers whose newborns weighed more than 3,000 grams felt that their babies might be healthy; therefore, the babies did not need to be tested for hearing function. Rubin (93) stated that most mothers expected to give birth as term and normal baby. They might be not clear about necessitate to the hearing screening test. However, minority of mothers believed that the hearing screenings were wasted and loss of time. It might be possible to alleviate this by delaying the test until the mothers received sufficient information about UNHS. Providing information using the video presentation in antenatal classes possibly offer a more effective way of communicating information to parents at an antenatal stage, and if the ward is quiet to test the baby at the mother's bedside (58). In

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first time mothers, maternal role attainment was the process of establishing a new role set, in which the behaviors and actions of the role were acquired, conditioned, and learning were reinforced and were culturally determined (93). Most of the first time mothers seem to be unavoidable to encounter with many problems such as newborn nursing, lack of knowledge and understanding on infant cues including the health personal advice during postpartum period in the hospital (94). They might feel so stressful and anxious with their role performance (95). Therefore, they might not prepare for the newborn hearing screening test at present. They might feel sorrow and worried about her new role in nursing her baby (96). Postpartum mothers with more children, in particular, need assistance with child care and household chores. Mothers with more children may be fatigue and stressful with 24 hour responsibilities of children and the endless household tasks and tend to be maladaptive mothers (97), they might feel so stressful and anxious with their role performance (95). The mothers who had 2 children, and who had experience in infant care-taking activities passed role performance. Therefore, they might want to know about their second child's hearing ability in comparison to the hearing ability of their older child.

Referring to question number 7, the results showed that 11/56 male parents (19.65 %) thought that the hearing screenings were dangerous to infants while 26/325 female parents (8.00 %) thought so. In addition, 26/207 parents (12.51%) whose newborns weighed more than 3,000 grams believed that the hearing screening was dangerous to infants while 11/174 parents (6.32%) whose newborns weighed 3,000 grams or less believed so. Moreover, 16/146 parents (10.95%) who had one child believed that the hearing screening was dangerous to infants while 7/147 parents (4.76%) who had 2 children, and 14/88 parents (15.91%) who had 3 or more children believed so. These findings showed that female parents had more positive attitude than male parents, and the parents whose babies weighed 3,000 grams or less had more positive attitude than the parents whose babies weighed more than 3,000 grams, and the parents who had 2 children had more positive attitude than those who had one child and those who had 3 or more children ($p<0.05$).

These findings could be implied that parents might be misunderstanding about UNHS technique which required placing a small probe in the ear canal of infant. If

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they had been well enough informed about hearing screening, this might improve understanding.

However, other personal profiles: gender of parent, educational level, occupation, income, gestational age, complication during pregnancy, type of deliver, gravida, history of hearing loss in family, and consanguineous marriage were not significantly related to parental attitudes to newborn hearing screening program.

5.5 Conclusions

The results of this study suggested the following conclusions:

1. Three hundred and fifty-nine parents (93.74%) were not at all worried and hardly worried to the neonatal hearing screening test. Also, their anxiety were increased if their babies did not pass hearing screening. Ninety-eight percent of the parents responded that they were willing to bring their
2. babies who failed the screening, and 74.9 % of the respondents reported that they were willing to bring their babies to the hospital where the initial screening was held.
3. Of all personal profiles, only consanguineous marriage was significantly related to parental anxiety.
4. The majority of respondents (76.2-99.5%) expressed positive attitudes to neonatal hearing screening. Most parents welcomed neonatal hearing screening, and considered that hearing screening had the potential to help and understand their children at the earliest possible time if a hearing impairment was detected. However, 29.5 % of the respondents considered that hearing screening caused them unnecessary worried.
5. Of all personal profiles, gender of parents, birth weight of newborn, and number of siblings were significantly related to parental attitudes.

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5.6 Recommendations

From the results of this study, some recommendations for practice and further study are as follows:

1. The results from this study should be used as a guideline for hearing screening administration to all newborns.
2. The results should be used as a guideline to inform parents concerning the importance of neonatal hearing screening.
3. The results of this study should be given to health professionals considering the importance of neonatal hearing screening.

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APPENDIX A: Raw Data

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TABLE A-1. Raw data of the relationship between maternal anxiety and personal factors using Chi-square method.

Sex	Anxiety		$\chi 2$	p-value
	Yes	No		
Male	23	33	2.153	.142
Female	169	158		

Age (years)	Anxiety		$\chi 2$	p-value
	Yes	No		
14-24	72	69	.080	.961
25-35	107	109		
36-46	13	13		

Education	Anxiety		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	90	86	2.638	.267
Secondary	79	71		
Diploma and bachelor	23	34		

Occupation	Anxiety		$\chi 2$	p-value
	Yes	No		
Housewife	74	70	3.176	.529
Employee	85	80		
Salesperson	20	22		
Agriculturist	12	14		
Civil servants and enterprise workers	1	50		

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TABLE A-1. Raw data of the relationship between maternal anxiety and personal factors using Chi-square method.(continued)

Income (baths)	Anxiety		χ^2	p-value
	Yes	No		
< 5,000	128	122	1.044	.593
5,000-10,000	46	46		
> 10,000	17	23		

Gestational age (weeks)	Anxiety		χ^2	p-value
	Yes	No		
≤ 36	82	68	2.029	.154
> 36	110	123		

Complication during pregnancy	Anxiety		χ^2	p-value
	Yes	No		
Yes	29	30	.020	.887
No	162	161		

Type of deliver	Anxiety		χ^2	p-value
	Yes	No		
Normal labour	135	139	.285	.593
Abnormal labour	57	52		

Birth weight of newborn (grams)	Anxiety		χ^2	p-value
	Yes	No		
≤ 3,000	85	89	.209	.648
> 3,000	107	102		

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TABLE A-1. Raw data of the relationship between maternal anxiety and personal factors using Chi-square method.(continued)

Gravida	Anxiety		χ^2	p-value
	Yes	No		
Primigravida	74	72	.029	.865
Multigravida	118	119		

Number of sibling	Anxiety		χ^2	p-value
	Yes	No		
1	75	72	2.168	.338
2	68	80		
≥ 3	49	39		

History of hearing loss in family	Anxiety		χ^2	p-value
	Yes	No		
Yes	12	14	.176	.674
No	180	177		

Consanguineous marriage	Anxiety		χ^2	p-value
	Yes	No		
Yes	22	10	4.842	.028
No	170	181		

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TABLE A-2. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 1		$\chi 2$	p-value
	Yes	No		
Male	56	0	-	-
Female	325	1		

Age (years)	Attitude number 1		$\chi 2$	p-value
	Yes	No		
14-24	140	0	-	-
25-35	215	1		
36-46	26	0		

Education	Attitude number 1		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	175	0	-	-
Secondary	149	1		
Diploma and bachelor	57	0		

Occupation	Attitude number 1		$\chi 2$	p-value
	Yes	No		
Housewife	142	1	-	-
Employee	165	0		
Salesperson	42	0		
Agriculturist	26	0		
Civil servants and enterprise workers	6	0		

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TABLE A-2. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 1		χ^2	p-value
	Yes	No		
< 5,000	248	1	-	-
5,000-10,000	92	0		
> 10,000	40	0		

Gestational age (weeks)	Attitude number 1		χ^2	p-value
	Yes	No		
≤ 36	150	0	-	-
> 36	231	1		

Complication during pregnancy	Attitude number 1		χ^2	p-value
	Yes	No		
Yes	59	0	-	-
No	321	1		

Type of deliver	Attitude number 1		χ^2	p-value
	Yes	No		
Normal labour	273	0	-	-
Abnormal labour	108	1		

Birth weight of newborn (grams)	Attitude number 1		χ^2	p-value
	Yes	No		
≤ 3,000	174	0	-	-
> 3,000	207	1		

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TABLE A-2. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 1		χ^2	p-value
	Yes	No		
Primigravida	145	0	-	-
Multigravida	236	1		

Number of sibling	Attitude number 1		χ^2	p-value
	Yes	No		
1	146	0	-	-
2	147	1		
≥ 3	88	0		

History of hearing loss in family	Attitude number 1		χ^2	p-value
	Yes	No		
Yes	26	0	-	-
No	355	1		

Consanguineous marriage	Attitude number 1		χ^2	p-value
	Yes	No		
Yes	31	0	-	-
No	350	1		

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TABLE A-3. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 2		$\chi 2$	p-value
	Yes	No		
Male	56	0	-	-
Female	320	5		

Age (years)	Attitude number 2		$\chi 2$	p-value
	Yes	No		
14-24	137	3	3.226	.199
25-35	214	1		
36-46	25	1		

Education	Attitude number 2		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	173	1	1.365	.505
Secondary	147	3		
Diploma and bachelor	56	1		

Occupation	Attitude number 2		$\chi 2$	p-value
	Yes	No		
Housewife	141	2	-	-
Employee	162	2		
Salesperson	42	0		
Agriculturist	25	1		
Civil servants and enterprise workers	6	0		

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TABLE A-3. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 2		$\chi 2$	p-value
	Yes	No		
< 5,000	244	4	-	-
5,000-10,000	91	1		
> 10,000	31	0		

Gestational age (weeks)	Attitude number 2		Z-test	p-value
	Yes	No		
≤ 36	148	1	.877	.192
> 36	228	4		

Complication during pregnancy	Attitude number 2		Z-test	p-value
	Yes	No		
Yes	56	2	-1.544	.0618
No	319	3		

Type of deliver	Attitude number 2		Z-test	p-value
	Yes	No		
Normal labour	271	1	1.901	.028
Abnormal labour	105	4		

Birth weight of newborn (grams)	Attitude number 2		z-test	p-value
	Yes	No		
≤ 3,000	171	3	-.649	.258
> 3,000	205	2		

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TABLE A-3. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 2		z-test	p-value
	Yes	No		
Primigravida	144	1	.83	.203
Multigravida	232	4		

Number of sibling	Attitude number 2		$\chi 2$	p-value
	Yes	No		
1	145	1	1.067	.587
2	144	3		
≥ 3	87	1		

History of hearing loss in family	Attitude number 2		$\chi 2$	p-value
	Yes	No		
Yes	26	0	-	-
No	350	5		

Consanguineous marriage	Attitude number 2		$\chi 2$	p-value
	Yes	No		
Yes	31	0	-	-
No	345	5		

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TABLE A-4. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 3		Z-test	p-value
	Yes	No		
Male	52	4	.51	.305
Female	295	30		

Age (years)	Attitude number 3		$\chi 2$	p-value
	Yes	No		
14-24	126	14	2.116	.347
25-35	199	16		
36-46	22	4		

Education	Attitude number 3		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	159	15	.212	.899
Secondary	137	13		
Diploma and bachelor	51	6		

Occupation	Attitude number 3		$\chi 2$	p-value
	Yes	No		
Housewife	128	15	-	-
Employee	151	13		
Salesperson	38	4		
Agriculturist	24	2		
Civil servants and enterprise workers	6	0		

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TABLE A-4. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 3		$\chi 2$	p-value
	Yes	No		
< 5,000	227	21	.203	.903
5,000-10,000	83	9		
> 10,000	36	4		

Gestational age (weeks)	Attitude number 3		$\chi 2$	p-value
	Yes	No		
≤ 36	132	17	1.860	.173
> 36	215	17		

Complication during pregnancy	Attitude number 3		$\chi 2$	p-value
	Yes	No		
Yes	52	6	.164	.685
No	294	28		

Type of deliver	Attitude number 3		$\chi 2$	p-value
	Yes	No		
Normal labour	251	21	1.694	.193
Abnormal labour	96	13		

Birth weight of newborn (grams)	Attitude number 3		$\chi 2$	p-value
	Yes	No		
≤ 3,000	160	14	.304	.582
> 3,000	187	20		

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TABLE A-4. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 3		$\chi 2$	p-value
	Yes	No		
Primigravida	136	9	2.126	.145
Multigravida	211	25		

Number of sibling	Attitude number 3		$\chi 2$	p-value
	Yes	No		
1	137	9	2.247	.325
2	131	16		
≥ 3	79	9		

History of hearing loss in family	Attitude number 3		Z-test	p-value
	Yes	No		
Yes	23	3	-0.48	.315
No	324	31		

Consanguineous marriage	Attitude number 3		Z-test	p-value
	Yes	No		
Yes	30	1	1.15	.125
No	317	33		

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TABLE A-5. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 4		$\chi 2$	p-value
	Yes	No		
Male	15	41	.175	.675
Female	96	229		

Age (years)	Attitude number 4		$\chi 2$	p-value
	Yes	No		
14-24	49	91	4.285	.117
25-35	57	158		
36-46	5	21		

Education	Attitude number 4		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	58	116	3.034	.219
Secondary	40	110		
Diploma and bachelor	13	44		

Occupation	Attitude number 4		$\chi 2$	p-value
	Yes	No		
Housewife	38	105	1.472	.832
Employee	52	112		
Salesperson	12	30		
Agriculturist	8	18		
Civil servants and enterprise workers	1	5		

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TABLE A-5. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 4		χ^2	p-value
	Yes	No		
< 5,000	80	168	3.544	.170
5,000-10,000	23	69		
> 10,000	8	32		

Gestational age (weeks)	Attitude number 4		χ^2	p-value
	Yes	No		
≤ 36	47	102	.688	.407
> 36	64	168		

Complication during pregnancy	Attitude number 4		χ^2	p-value
	Yes	No		
Yes	18	40	.145	.703
No	92	230		

Type of deliver	Attitude number 4		χ^2	p-value
	Yes	No		
Normal labour	79	193	.004	.951
Abnormal labour	32	77		

Birth weight of newborn (grams)	Attitude number 4		χ^2	p-value
	Yes	No		
≤ 3,000	50	124	.025	.875
> 3,000	61	146		

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TABLE A-5. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 4		χ^2	p-value
	Yes	No		
Primigravida	44	101	.166	.683
Multigravida	67	169		

Number of sibling	Attitude number 4		χ^2	p-value
	Yes	No		
1	44	102	.188	.910
2	41	106		
≥ 3	26	62		

History of hearing loss in family	Attitude number 4		χ^2	p-value
	Yes	No		
Yes	10	16	1.176	.278
No	101	254		

Consanguineous marriage	Attitude number 4		χ^2	p-value
	Yes	No		
Yes	9	22	.000	.990
No	102	248		

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TABLE A-6. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 5		χ2	p-value
	Yes	No		
Male	56	0	-	-
Female	320	5		

Age (years)	Attitude number 5		χ2	p-value
	Yes	No		
14-24	138	2	-	-
25-35	212	3		
36-46	26	0		

Education	Attitude number 5		χ2	p-value
	Yes	No		
Illiterate and primary	171	3	.797	.671
Secondary	149	1		
Diploma and bachelor	56	1		

Occupation	Attitude number 5		χ2	p-value
	Yes	No		
Housewife	140	3	-	-
Employee	162	2		
Salesperson	42	0		
Agriculturist	26	0		
Civil servants and enterprise workers	6	0		

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TABLE A-6. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 5		χ^2	p-value
	Yes	No		
< 5,000	244	4	-	-
5,000-10,000	91	1		
> 10,000	40	0		

Gestational age (weeks)	Attitude number 5		Z-test	p-value
	Yes	No		
≤ 36	148	1	.88	.182
> 36	228	4		

Complication during pregnancy	Attitude number 5		χ^2	p-value
	Yes	No		
Yes	58	0	-	-
No	317	5		

Type of deliver	Attitude number 5		χ^2	p-value
	Yes	No		
Normal labour	267	5	-	-
Abnormal labour	109	0		

Birth weight of newborn (grams)	Attitude number 5		Z-test	p-value
	Yes	No		
≤ 3,000	172	2	-0.15	.44
> 3,000	204	3		

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TABLE A-6. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 5		Z-test	p-value
	Yes	No		
Primigravida	144	1	.21	.416
Multigravida	232	4		

Number of sibling	Attitude number 5		$\chi 2$	p-value
	Yes	No		
1	145	1	1.067	.587
2	144	3		
≥ 3	87	1		

History of hearing loss in family	Attitude number 5		$\chi 2$	p-value
	Yes	No		
Yes	26	0	-	-
No	350	5		

Consanguineous marriage	Attitude number 5		$\chi 2$	p-value
	Yes	No		
Yes	31	0	-	-
No	345	5		

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TABLE A-7. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 6		Z-test	p-value
	Yes	No		
Male	3	53	1.24	.105
Female	35	290		

Age (years)	Attitude number 6		$\chi 2$	p-value
	Yes	No		
14-24	18	122	3.679	.159
25-35	16	199		
36-46	4	22		

Education	Attitude number 6		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	13	161	2.569	.277
Secondary	17	133		
Diploma and bachelor	8	49		

Occupation	Attitude number 6		$\chi 2$	p-value
	Yes	No		
Housewife	17	126	1.973	.741
Employee	13	151		
Salesperson	5	37		
Agriculturist	2	24		
Civil servants and enterprise workers	1	5		

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TABLE A-7. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 6		χ^2	p-value
	Yes	No		
< 5,000	26	222	2.956	.228
5,000-10,000	11	81		
> 10,000	1	39		

Gestational age (weeks)	Attitude number 6		χ^2	p-value
	Yes	No		
≤ 36	20	129	3.242	.072
> 36	18	214		

Complication during pregnancy	Attitude number 6		χ^2	p-value
	Yes	No		
Yes	6	52	.009	.924
No	32	290		

Type of deliver	Attitude number 6		χ^2	p-value
	Yes	No		
Normal labour	25	247	.648	.421
Abnormal labour	13	96		

Birth weight of newborn (grams)	Attitude number 6		χ^2	p-value
	Yes	No		
≤ 3,000	10	164	6.372	.012
> 3,000	28	179		

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TABLE A-7. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 6		$\chi 2$	p-value
	Yes	No		
Primigravida	18	127	1.552	.213
Multigravida	20	216		

Number of sibling	Attitude number 6		$\chi 2$	p-value
	Yes	No		
1	18	128	7.606	.022
2	7	140		
≥ 3	13	75		

History of hearing loss in family	Attitude number 6		z-test	p-value
	Yes	No		
Yes	2	24	-0.13	.448
No	36	319		

Consanguineous marriage	Attitude number 6		z-test	p-value
	Yes	No		
Yes	2	29	.67	.248
No	36	314		

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TABLE A-8. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 7		$\chi 2$	p-value
	Yes	No		
Male	11	45	7.385	.007
Female	26	299		

Age (years)	Attitude number 7		$\chi 2$	p-value
	Yes	No		
14-24	11	129	1.570	.456
25-35	22	193		
36-46	4	22		

Education	Attitude number 7		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	23	151	4.492	.105
Secondary	10	140		
Diploma and bachelor	4	53		

Occupation	Attitude number 7		$\chi 2$	p-value
	Yes	No		
Housewife	12	131	-	-
Employee	18	146		
Salesperson	3	39		
Agriculturist	4	22		
Civil servants and enterprise workers	0	6		

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TABLE A-8. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 7		χ^2	p-value
	Yes	No		
< 5,000	26	222	1.179	.555
5,000-10,000	9	83		
> 10,000	2	38		

Gestational age (weeks)	Attitude number 7		χ^2	p-value
	Yes	No		
≤ 36	18	131	1.567	.211
> 36	19	213		

Complication during pregnancy	Attitude number 7		χ^2	p-value
	Yes	No		
Yes	6	52	.061	.806
No	30	292		

Type of deliver	Attitude number 7		χ^2	p-value
	Yes	No		
Normal labour	26	246	.025	.874
Abnormal labour	11	98		

Birth weight of newborn (grams)	Attitude number 7		χ^2	p-value
	Yes	No		
≤ 3,000	11	163	4.196	.041
> 3,000	26	181		

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TABLE A-8. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 7		$\chi 2$	p-value
	Yes	No		
Primigravida	16	129	.467	.494
Multigravida	21	215		

Number of sibling	Attitude number 7		$\chi 2$	p-value
	Yes	No		
1	16	130	8.221	.016
2	7	140		
≥ 3	14	74		

History of hearing loss in family	Attitude number 7		Z-test	p-value
	Yes	No		
Yes	3	23	-0.32	.125
No	34	321		

Consanguineous marriage	Attitude number 7		Z-test	p-value
	Yes	No		
Yes	3	28	.007	.50
No	34	316		

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TABLE A-9. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 8		Z-test	p-value
	Yes	No		
Male	55	1	1.04	.149
Female	309	16		

Age (years)	Attitude number 8		$\chi 2$	p-value
	Yes	No		
14-24	136	4	-	-
25-35	202	13		
36-46	26	0		

Education	Attitude number 8		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	163	11	2.840	.242
Secondary	145	5		
Diploma and bachelor	56	1		

Occupation	Attitude number 8		$\chi 2$	p-value
	Yes	No		
Housewife	137	6	1.897	.755
Employee	158	6		
Salesperson	39	3		
Agriculturist	24	2		
Civil servants and enterprise workers	6	0		

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TABLE A-9. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 8		$\chi 2$	p-value
	Yes	No		
< 5,000	234	14	3.292	.193
5,000-10,000	91	1		
> 10,000	38	2		

Gestational age (weeks)	Attitude number 8		$\chi 2$	p-value
	Yes	No		
≤ 36	142	7	.032	.858
> 36	222	10		

Complication during pregnancy	Attitude number 8		Z-test	p-value
	Yes	No		
Yes	57	1	1.02	.154
No	306	16		

Type of deliver	Attitude number 8		Z-test	p-value
	Yes	No		
Normal labour	256	16	-2.14	.016
Abnormal labour	108	1		

Birth weight of newborn (grams)	Attitude number 8		X2	p-value
	Yes	No		
≤ 3,000	167	7	.145	.704
> 3,000	197	10		

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TABLE A-9. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 8		X2	p-value
	Yes	No		
Primigravida	140	5	.564	.453
Multigravida	224	12		

Number of sibling	Attitude number 8		X2	p-value
	Yes	No		
1	141	5	1.564	.457
2	141	6		
≥ 3	82	6		

History of hearing loss in family	Attitude number 8		Z-test	p-value
	Yes	No		
Yes	24	2	-0.81	.08
No	340	15		

Consanguineous marriage	Attitude number 8		X2	p-value
	Yes	No		
Yes	31	0	-	-
No	333	17		

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TABLE A-10. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 9		χ2	p-value
	Yes	No		
Male	46	246	1.110	.292
Female	10	79		

Age (years)	Attitude number 9		χ2	p-value
	Yes	No		
14-24	113	27	2.075	.354
25-35	160	55		
36-46	19	7		

Education	Attitude number 9		χ2	p-value
	Yes	No		
Illiterate and primary	128	46	1.789	.409
Secondary	118	32		
Diploma and bachelor	46	11		

Occupation	Attitude number 9		χ2	p-value
	Yes	No		
Housewife	116	27	5.827	.212
Employee	123	41		
Salesperson	27	15		
Agriculturist	21	5		
Civil servants and enterprise workers	5	1		

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TABLE A-10. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 9		χ^2	p-value
	Yes	No		
< 5,000	186	62	3.908	.142
5,000-10,000	77	15		
> 10,000	28	12		

Gestational age (weeks)	Attitude number 9		χ^2	p-value
	Yes	No		
≤ 36	114	35	.002	.962
> 36	178	54		

Complication during pregnancy	Attitude number 9		χ^2	p-value
	Yes	No		
Yes	46	12	.285	.594
No	245	77		

Type of deliver	Attitude number 9		χ^2	p-value
	Yes	No		
Normal labour	212	60	.899	.343
Abnormal labour	80	29		

Birth weight of newborn (grams)	Attitude number 9		χ^2	p-value
	Yes	No		
≤ 3,000	136	38	.414	.520
> 3,000	156	51		

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TABLE A-10. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 9		χ^2	p-value
	Yes	No		
Primigravida	116	29	1.476	.224
Multigravida	176	60		

Number of sibling	Attitude number 9		χ^2	p-value
	Yes	No		
1	117	29	1.639	.441
2	109	38		
≥ 3	66	22		

History of hearing loss in family	Attitude number 9		χ^2	p-value
	Yes	No		
Yes	19	7	.198	.656
No	273	82		

Consanguineous marriage	Attitude number 9		χ^2	p-value
	Yes	No		
Yes	21	10	1.493	.222
No	271	79		

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TABLE A-11. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 10		Z-test	p-value
	Yes	No		
Male	55	1		
Female	310	16	1.04	.149

Age (years)	Attitude number 10		$\chi 2$	p-value
	Yes	No		
14-24	134	6	.048	.976
25-35	206	10		
36-46	25	1		

Education	Attitude number 10		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	163	12	4.621	.099
Secondary	147	3		
Diploma and bachelor	55	2		

Occupation	Attitude number 10		$\chi 2$	p-value
	Yes	No		
Housewife	138	5	-	-
Employee	156	9		
Salesperson	39	3		
Agriculturist	26	0		
Civil servants and enterprise workers	6	0		

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TABLE A-11. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 10		$\chi 2$	p-value
	Yes	No		
< 5,000	233	16	-	-
5,000-10,000	92	0		
> 10,000	39	1		

Gestational age (weeks)	Attitude number 10		$\chi 2$	p-value
	Yes	No		
≤ 36	142	8	.453	.501
> 36	223	9		

Complication during pregnancy	Attitude number 10		Z-test	p-value
	Yes	No		
Yes	56	3	-0.24	.405
No	308	14		

Type of deliver	Attitude number 10		$\chi 2$	p-value
	Yes	No		
Normal labour	261	12	.007	.935
Abnormal labour	104	5		

Birth weight of newborn (grams)	Attitude number 10		$\chi 2$	p-value
	Yes	No		
≤ 3,000	166	8	.016	.898
> 3,000	199	9		

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TABLE A-11. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 10		$\chi 2$	p-value
	Yes	No		
Primigravida	140	5	.552	.458
Multigravida	225	12		

Number of sibling	Attitude number 10		$\chi 2$	p-value
	Yes	No		
1	141	5	1.576	.455
2	142	6		
≥ 3	82	6		

History of hearing loss in family	Attitude number 10		Z-test	p-value
	Yes	No		
Yes	22	4	-0.88	.189
No	343	13		

Consanguineous marriage	Attitude number 10		Z-test	p-value
	Yes	No		
Yes	29	2	-0.57	.284
No	336	15		

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TABLE A-12. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 11		χ2	p-value
	Yes	No		
Male	50	6	1.092	.296
Female	303	22		

Age (years)	Attitude number 11		χ2	p-value
	Yes	No		
14-24	126	14	2.436	.296
25-35	203	12		
36-46	24	2		

Education	Attitude number 11		χ2	p-value
	Yes	No		
Illiterate and primary	159	15	.880	.644
Secondary	140	10		
Diploma and bachelor	54	3		

Occupation	Attitude number 11		χ2	p-value
	Yes	No		
Housewife	137	6	5.380	.250
Employee	149	15		
Salesperson	37	5		
Agriculturist	25	1		
Civil servants and enterprise workers	5	1		

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TABLE A-12. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Income (baths)	Attitude number 11		$\chi 2$	p-value
	Yes	No		
< 5,000	227	21	1.272	.529
5,000-10,000	87	5		
> 10,000	38	2		

Gestational age (weeks)	Attitude number 11		$\chi 2$	p-value
	Yes	No		
≤ 36	138	11	.000	.984
> 36	215	17		

Complication during pregnancy	Attitude number 11		Z-test	p-value
	Yes	No		
Yes	55	3	.75	.226
No	297	25		

Type of deliver	Attitude number 11		$\chi 2$	p-value
	Yes	No		
Normal labour	251	21	.193	.661
Abnormal labour	102	7		

Birth weight of newborn (grams)	Attitude number 11		$\chi 2$	p-value
	Yes	No		
≤ 3,000	163	11	.496	.481
> 3,000	190	17		

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TABLE A-12. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Gravida	Attitude number 11		$\chi 2$	p-value
	Yes	No		
Primigravida	130	15	3.085	.079
Multigravida	223	13		

Number of sibling	Attitude number 11		$\chi 2$	p-value
	Yes	No		
1	131	15	2.979	.226
2	139	8		
≥ 3	83	5		

History of hearing loss in family	Attitude number 11		Z-test	p-value
	Yes	No		
Yes	24	2	-0.68	.248
No	329	26		

Consanguineous marriage	Attitude number 11		Z-test	p-value
	Yes	No		
Yes	28	3	-0.51	.305
No	325	25		

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TABLE A-13. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.

Sex	Attitude number 12		Z-test	p-value
	Yes	No		
Male	55	1	.73	.232
Female	313	12		

Age (years)	Attitude number 12		$\chi 2$	p-value
	Yes	No		
14-24	133	7	1.856	.395
25-35	210	5		
36-46	25	1		

Education	Attitude number 12		$\chi 2$	p-value
	Yes	No		
Illiterate and primary	165	9	3.019	.221
Secondary	147	3		
Diploma and bachelor	56	1		

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TABLE A-13. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Occupation	Attitude number 12		$\chi 2$	p-value
	Yes	No		
Housewife	137	6	-	-
Employee	157	7		
Salesperson	42	0		
Agriculturist	26	0		
Civil servants and enterprise workers	6	0		

Income (baths)	Attitude number 12		$\chi 2$	p-value
	Yes	No		
< 5,000	239	9	.767	.681
5,000-10,000	90	2		
> 10,000	38	2		

Gestational age (weeks)	Attitude number 12		$\chi 2$	p-value
	Yes	No		
$\leq$ 36	142	7	1.228	.268
> 36	226	6		

Complication during pregnancy	Attitude number 12		$\chi 2$	p-value
	Yes	No		
Yes	58	0	-	-
No	309	13		

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TABLE A-13. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

Type of deliver	Attitude number 12		Z-test	p-value
	Yes	No		
Normal labour	261	11	-0.98	.163
Abnormal labour	107	2		

Birth weight of newborn (grams)	Attitude number 12		X2	p-value
	Yes	No		
≤ 3,000	167	7	.363	.547
> 3,000	201	6		

Gravida	Attitude number 12		Z-test	p-value
	Yes	No		
Primigravida	141	4	.42	.337
Multigravida	227	9		

Number of sibling	Attitude number 12		$\chi 2$	p-value
	Yes	No		
1	142	4	.543	.762
2	142	5		
≥ 3	84	4		

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TABLE A-13. Raw data of the relationship between maternal attitude and personal factors using Chi-square method or Z-test.(continued)

History of hearing loss in family	Attitude number 12		$\chi 2$	p-value
	Yes	No		
Yes	26	0	-	-
No	342	13		

Consanguineous marriage	Attitude number 12		$\chi 2$	p-value
	Yes	No		
Yes	31	0	-	-
No	337	13		

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APPENDIX B: Questionnaire

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แบบสอบถามความวิตกกังวลและทัศนคติของผู้ปกครอง

ที่มีต่อการตรวจคัดกรองการได้ยิน

<u>ส่วนที่ 1</u> ข้อมูลส่วนบุคคล

1. เพศ ( ) ชาย ( ) หญิง

2. มีภูมิลำเนาอยู่ในจังหวัด.....

ปัจจุบันอยู่จังหวัด.....

3. ท่านอายุ.....ปี

4. ระดับการศึกษา

( ) ไม่เคยได้รับการศึกษา ( ) ประถมศึกษา

( ) มัธยมศึกษา ( ) อนุปริญญาหรือสายอาชีพ

( ) ปริญญาตรี ( ) สูงกว่าปริญญาตรี

5. อาชีพ

( ) งานบ้าน ( ) รับจ้าง

( ) ค้าขาย ( ) เกษตรกร

( ) รับราชการหรือรัฐวิสาหกิจ ( ) อื่นๆ.....

6. รายได้ของครอบครัว (ต่อเดือน)

( ) ต่ำกว่า 5,000 บาท ( ) 5,001-10,000 บาท

( ) 10,001-15,000 บาท ( ) มากกว่า 15,000 บาท

7. การฝากครรภ์

( ) ฝาก ( ) ไม่ฝาก

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8. การตั้งครรภ์

( ) ตั้งครรภ์ตามธรรมชาติ ( ) ใช้ฮอร์โมนกระตุ้นไข่

( ) การปฏิสนธินอกร่างกาย

9. ระยะเวลาการตั้งครรภ์.....สัปดาห์

10. การเจ็บป่วยก่อนตั้งครรภ์

( ) มี ..... ( ) ไม่มี

11. วิธีการคลอด

( ) คลอดปกติ ( ) คลอดผิดปกติ แบบ.....

เนื่องจาก.....

12. น้ำหนักทารกแรกคลอด.....กรัม

13. ลำดับการตั้งครรภ์

( ) ครรภ์แรก ( ) ไม่ใช่ครรภ์แรก

14. จำนวนบุตรที่มีชีวิตในปัจจุบัน.....คน

15. ประวัติในครอบครัว

15.1 มีญาติพี่น้องหูตึง หูหนวก เป็นใบ้หรือพูดไม่ชัด

( ) มี ( ) ไม่มี

15.2 บิดามารดาเป็นเครือญาติกัน

( ) เป็น ( ) ไม่เป็น

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ส่วนที่2 สอบถามความวิตกกังวล

1. ท่านมีความรู้สึกวิตกกังวลเมื่อลูกของท่านได้รับการตรวจคัดกรองการได้ยิน

( ) ใช่ ( ) ไม่ใช่

หากข้อ 1 ท่านตอบ “ใช่” ให้ตอบคำถามในข้อ 2 ด้วย หากตอบ “ไม่ใช่” ให้ข้ามไปทำข้อ 3

2. หากท่านมีความวิตกกังวล ท่านมีความรู้สึกเช่นใดบ้าง

( ) กลัว ( ) ตกใจ ( ) กระวนกระวาย ( ) ร้อนๆ หนาวๆ โดยไม่ทราบสาเหตุ

( ) หัวใจเต้นเร็ว ( ) หายใจลำบาก แน่นหน้าอก ( ) คลื่นไส้ อาเจียน

( ) ปวดศีรษะ ( ) อื่นๆ.....

3. ท่านรู้สึกวิตกกังวล เมื่อผลการตรวจคัดกรองการได้ยินของลูกท่าน “ไม่ผ่าน” หรือ “อ่านผลไม่ได้”

( ) ใช่ ( ) ไม่ใช่

4. หากลูกของท่านตรวจ “ไม่ผ่าน” ท่านจะนำลูกของท่านมาตรวจคัดกรองการได้ยินซ้ำตามนัด

( ) ใช่ ( ) ไม่ใช่

5. หากต้องนำลูกของท่านมาตรวจคัดกรองการได้ยินซ้ำ ท่านรู้สึกกังวล

( ) ใช่ ( ) ไม่ใช่

6. หากต้องนำลูกของท่านมาตรวจคัดกรองการได้ยินซ้ำ ท่านรู้สึกลำบากในการเดินทางมาโรงพยาบาล

( ) ใช่ ( ) ไม่ใช่

7. หากลูกของท่านตรวจ “ไม่ผ่าน” ท่านจะนำลูกของท่านไปรับการรักษาที่โรงพยาบาลอื่น

( ) ใช่ ( ) ไม่ใช่

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ส่วนที่ 3 ทัศนคติของผู้ปกครองที่มีต่อการตรวจคัดกรองการได้ยิน

ข้อความ	ใช่	ไม่ใช่
1. ท่านยินดีให้ลูกของท่านได้รับการตรวจคัดกรองการได้ยิน		
2. ท่านคิดว่าทารกแรกเกิดทุกคนควรได้รับการตรวจคัดกรองการได้ยิน		
3.ท่านเชื่อว่าหากทารกแรกเกิดมีภาวะสูญเสียการได้ยิน จะมีปัญหาเรื่องภาษาพูดด้วย		
4. ท่านคิดว่าการตรวจคัดกรองการได้ยิน ทำให้ท่านเกิดความวิตกกังวลโดยไม่จำเป็น		
5. ท่านคิดว่าการตรวจคัดกรองการได้ยิน เป็นสิ่งที่เป็นประโยชน์กับทารก-แรกเกิด		
6. ท่านเชื่อว่าการตรวจคัดกรองการได้ยิน เป็นการตรวจที่ไม่คุ้มค่าสิ้นเปลือง เสียเวลา		
7. ท่านคิดว่าการตรวจคัดกรองการได้ยิน เป็นอันตรายต่อทารกแรกเกิด		
8. ท่านคิดว่าการให้ข้อมูลเกี่ยวกับการตรวจคัดกรองการได้ยินกับพ่อแม่เป็นสิ่งจำเป็น		
9. ท่านเชื่อว่าการตรวจคัดกรองการได้ยินเป็นสิ่งที่นำไปสู่การวินิจฉัยได้ว่าเด็กมีภาวะสูญเสียการได้ยิน		
10. ท่านเชื่อว่าการตรวจคัดกรองการได้ยินเป็นสิ่งจำเป็นที่นำไปสู่การรักษาตั้งแต่ต้น หากพบว่าเด็กมีภาวะสูญเสียการได้ยิน		

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ข้อความ	ใช่	ไม่ใช่
11. ท่านคิดว่าหากผลการตรวจคัดกรองการได้ยินได้ผล “ไม่ผ่าน” ทารกแรกเกิดควรได้รับการตรวจซ้ำเมื่ออายุ 1-2 เดือน		
12. ท่านเชื่อว่าการวินิจฉัยภาวะสูญเสียการได้ยินในทารกแรกเกิดได้ก่อนอายุ 6 เดือนและทำการรักษาฟื้นฟูอย่างรวดเร็ว จะทำให้สมรรถภาพด้านการฟังและการพูดมีพัฒนาการที่ดี		

ข้อเสนอแนะ.....

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APPENDIX C: Information about newborn hearing screening

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พัฒนาการด้านภาษาพูดและการเข้าใจภาษาของเด็ก

แรกเกิด - 3 เดือน
- เด็กสะดุ้งตกใจ, ขยับตา, หรือระงับเสียงร้องเมื่อได้ยินเสียงดัง เช่น เสียงแตร
- ทำท่าตอบสนองเมื่อคุยหรือพูดด้วย
- หยุดพูดเมื่อเด็กร้อง

3-6 เดือน
- เด็กสามารถหันศีรษะไปหาข้างที่มาของเสียงที่เกิดขึ้นข้างตัวเด็ก แม้เสียงค่อย
- เด็กจะออกเสียงอย่างมีความสุข เช่น อา-อา, อู-อู

6-9 เดือน
- เด็กจะหันศีรษะไปมาเพื่อหาเสียงที่ชื่อที่เรียกหรือคำพูดที่คุ้นเคย
- เด็กจะออกเสียงหยุดๆ ยาวๆ ได้ 4-6 พยางค์ เช่น ดา-ดา-ดา, บาดบาดา
- เด็กจะฟังและเชื่อมโยงสิ่งต่างๆ จากสิ่งแวดล้อม เช่น เสียงรถยนต์ เสียงจิ้งจก ตุ๊กแก

9-12 เดือน
- เด็กจะหันศีรษะมองไปยังเสียงที่เกิดข้างตัวที่อยู่ต่ำกว่าระดับหูได้อย่างรวดเร็ว
- เด็กแสดงท่าทางได้ถูกต้อง เมื่อท่านสั่งให้เด็กทำ เช่น บ๊ายบาย, ส่วัสดี, ขอ
- เด็กพูดคำพยางค์ซ้ำๆ เช่น ดา-ดา, มา-มา
- เด็กจะหันหาเสียงได้ถูกต้องทุกทิศทาง
- เด็กจะมองหาสิ่งของเมื่อคุณพ่อคุณแม่ถูกต้อง

12-18 เดือน
- เด็กพูดเป็นคำๆ ได้อย่างน้อย 10-15 คำ โดยมากจะใช้คำพูดที่ออกเสียงได้ง่ายๆ ที่มีพยางค์เดียว หมา, แมว หรือบอกความต้องการง่ายๆ เอา, ไป

18-24 เดือน
- เด็กสามารถทำตามคำสั่งง่ายๆ ได้ ชี้อวัยวะได้อย่างน้อย 2 อย่าง, ชี้สิ่งของ ที่คุ้นเคยได้เมื่อพ่อแม่เรียกชื่อของสิ่งนั้น
- เด็กพูดได้ประมาณ 40-100 คำ และเริ่มพูดเป็นวลีสั้นๆ เช่น อาหาร

ท่านสามารถนำบุตรหลานมารับการตรวจได้ที่
1. โรงพยาบาลรามาธิบดี กรุงเทพฯ
2. โรงพยาบาลเมตตาประชารักษ์ (วัดไร้ขิง) จ.สมุทรปฐม
3. โรงพยาบาลราชบุรี จ.ราชบุรี
4. โรงพยาบาลสกลนคร จ.สกลนคร
5. โรงพยาบาลสระบุรี จ.สระบุรี
6. โรงพยาบาลสุไหงโก-ลก จ.นราธิวาส
7. โรงพยาบาลนครพิงค์ จ.เชียงใหม่
8. โรงพยาบาลหาดใหญ่ จ.สงขลา
9. โรงพยาบาลอุดรธานี จ.อุดรธานี
10. โรงพยาบาลมหาวิทยาลัยขอนแก่น จ.ขอนแก่น

โครงการตรวจคัดกรองการได้ยิน

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BIOGRAPHY

NAME	Mr.Arun Suwannapak
DATE OF BIRTH	19 July 1970
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POSITION&OFFICE	Present, OPD ENT Songkhla Hospital, Songkhla, Thailand 90110 Position: Register nurse E-mail: sarun074@yahoo.com

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