

# THE PARENT SATISFACTION QUESTIONNAIRE WITH THE NEONATAL HEARING SCREENING PROGRAMME - ROMANIAN VERSION

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**Abstract:** As the Neonatal Hearing Screening Programme is still being implemented in Romania, it is important to study parent satisfaction because the success of the hearing screening depends on the parent's cooperation. We aimed at validating the Romanian version of The Parent Satisfaction Questionnaire with A Neonatal Hearing Screening Programme. This study included 137 participants and a sample of 30 participants who filled out a second copy of the questionnaire a month later. We recorded high levels of overall satisfaction, but smaller levels of satisfaction for each of the four dimensions of the questionnaire: the satisfaction with the information, the medical staff responsible for hearing testing and the appointment schedule. The Romanian version of the questionnaire showed a good internal consistency, strong test-retest reliability and positive significant correlations between overall satisfaction with all dimensions of the questionnaire. The Parent Satisfaction Questionnaire with the Neonatal Hearing Screening Programme proved to be valid and reliable for assessing parent satisfaction with the hearing screening.

## INTRODUCTION

Hearing impairment is considered the most common congenital defect.(1,2) Because it is more prevalent than other conditions that are screened at birth, such as sickle cell disease, hypothyroidism, phenylketonuria, galactosemia (3), it is recommended to use the Neonatal Hearing Screening Programme.

Universal neonatal hearing screening owes its beginning to the audiologist Marion Downs, who demonstrated in 1964, the reliable detection of severe-to-profound hearing loss by behavioural hearing screening of neonates.(4,5) In the beginning, hearing screening used the behavioural distraction test when the infant was old enough (6-9 months).(6) The clinical use of objective noninvasive physiological hearing tests like otoacoustic emissions and automated auditory brainstem response has facilitated the implementation of neonatal hearing screening in many countries.(7)

In 1994, the Joint Committee on Infant Hearing (JCIH) in the United States of America issued their position statement that endorsed “the goal of neonatal hearing screening programme (NHSP) is to identify neonates with hearing loss before three months of age and to begin an intervention programme before six months of age”.(8)

The main objectives of neonatal hearing screening can be described as 1-3-6 rule: hearing screening at birth and 1 month, audiological assessment by 3 months of age and initiation of appropriate treatment at 6 months.(7,9)

In 2000, the JCIH stated the importance of measuring parent satisfaction when evaluating and monitoring the success of Neonatal Hearing Screening Programme.(10) This new concept in healthcare of parent satisfaction is being recently investigated because the success of the neonatal hearing screening depends on the parent's cooperation, compliance to treatment and on their return to use the same service.(11,12,13,14,15,16) On the other hand, parent

satisfaction prevents the rejection of hearing screening and measures the quality and the usefulness of neonatal hearing screening.(17)

In an attempt to measure the parent satisfaction, Mazlan et al (2006) developed a valid and reliable questionnaire which allows determining the level of parent satisfaction (overall satisfaction and specific dimensions of satisfaction: information, medical staff in charge of the hearing screening, appointment schedule).(18)

The same questionnaire was translated and adapted in Spanish by Nunez-Batalla et al. (2009) who reported high levels of satisfaction with all aspects of the neonatal hearing screening programme.(19) Shojaee et al. (2003) studied parent satisfaction with neonatal hearing screening using the Persian version of Mazlan's questionnaire and reported that the questionnaire has satisfactory reliability and validity for assessing the parent satisfaction and is recommended for improving neonatal hearing screening programme.(20)

Mazlan et al (2014) reported that this questionnaire is an easy and effective tool and that parents were generally satisfied with the Neonatal Hearing Screening Programme, though communication with personnel in charge of testing needs constant improvements.

## PURPOSE

Since there is no research trying to measure the parent satisfaction with neonatal hearing screening in Romania, this study proposes to validate the Romanian version of The Parent Satisfaction Questionnaire with Neonatal Hearing Screening Programme (PSQ-NHSP).

## MATERIALS AND METHODS

### Study design

In Romania, the Neonatal Hearing Screening Programme is still being implemented and is not yet available

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all around the country, therefore not all the babies are screened at birth. In our Department of Otorhinolaryngology, the NHSP is performed in a three-stage schedule: the first stage otoacoustic emission (transient otoacoustic emissions, TEOAE or distortion products, DPOAE) at birth (if performed) or at 1 month old (if hearing screening is not performed at birth or if the results of the screening were refer); the second stage: otoacoustic emissions (TEOAE and / or DPOAE) and / or evoked auditory potentials screening at around 3 months (if the result of first hearing screening was refer); the third stage: otoacoustic emissions (TEOAE, DPOAE), tympanometry and acoustic reflex, auditory evoked potentials at around 6 months old (if the result of the second hearing screening was refer or if risk factors were identified). While patients diagnosed as pass are considered to have absent or minimal risk for sensorineural hearing loss, patients diagnosed as refer are considered to have high risk of hearing loss.

The present study was performed in the Department of Otorhinolaryngology Cluj-Napoca, during a period of 5 months, from October 2013 until February 2014. It was a cross-sectional study using a survey method.

The study has been approved by the ethical commission of the University of Medicine and Pharmacy "Iuliu Hațieganu", Cluj-Napoca.

#### *Questionnaire*

The Parent Satisfaction Questionnaire with the Neonatal Hearing Screening was translated from English to Romanian and adapted for Romanian-speaking patients according to the international guidelines for self-reported questionnaire through a process of reviews and modifications.(21,22)

The questionnaire contains 28 questions structured on four factors that influence parent satisfaction: information (questions 1-5), medical staff responsible for testing the infants (questions 9-16), appointment schedule (questions 8, 17-22) and overall satisfaction (questions 23-26). The questionnaire contains different types of questions: one multiple choice item (question 1), one dichotomous item (question 2), 22 close-ended items Likert-type (question 3-5, 8-26) and 3 open-ended (6, 27a, 27b, 28). The 22 Likert-like items are randomly chosen as assertive or non-assertive sentences in order to avoid the participant's tendency to agree regardless the content. There are five different options to answer from strongly disagree to strongly agree, scored from 1 to 5. The three open-ended questions give participants the chance to express satisfaction or dissatisfaction, suggestions for improvement the written information about hearing screening and improvement of the Neonatal Hearing Screening Programme.

Questions 1-6 investigate the information the participants have about the programme before performing the hearing screening. The first question, a multiple choice item, reveals the source of the first knowledge about the hearing screening programme. The second question, a dichotomous item, investigates the information received by the parents before hearing screening. If the parent had received any written information previous to the appointment, the parent is asked to answer the questions 3-5. The sixth question is an open-ended item that allows the parent to give suggestions for improving the written information received prior to the hearing screening.

The seventh question inquires the information about the test results.

The questions 8, 17-22 (close-ended items) offer information about appointment schedule regarding the access, participation and testing environment.

Eight close-ended items (questions 9-16) give information about the medical staff that had tested the child,

information related to communication, competency and attitude toward the child.

Questions 23-26 investigate the overall parent satisfaction. Mazlan borrowed this four questions from Client Satisfaction Questionnaire-8 (23) based on the study of Byalin who demonstrated that the items are an effective and easy instrument to assess overall satisfaction and can be easily applied without major modification in health-care service.(24)

#### *Participants*

This study included 137 parents whose infants had their hearing screened in our department. The inclusion criteria were based on the participants agreement to freely complete the questionnaire (one parent for each child included in the Neonatal Hearing Programme).

There was none exclusion criteria. The participants completed the questionnaire at the end of the scheduled hearing screening. All the parents asked to fill out this questionnaire had not refused.

In order to assess test-retest reliability, a sample of 30 participants was asked to complete a second copy of the questionnaire a month later, but only 25 had returned the questionnaire by post to our department.

#### *Statistical analysis*

The data were analyzed using the Microsoft Excel 2005 and SPSS 13 in order to describe the four dimensions of parental satisfaction with the neonatal hearing screening.

Psychometric evaluation of the PSQ-NHSP included evaluation of the internal consistency (assessed with Cronbach's alpha coefficient, calculated for the entire questionnaire and for each of the four dimensions of the PSQ-NHSP) and construct validity (assessed with Pearson's rank correlation coefficient, calculated for each of the four dimensions of the PSQ-NHSP) and test-retest reliability (assessed with Spearman's rank correlation coefficient, calculated for each of the four dimensions of the PSQ-NHSP).

## RESULTS

### *General results*

In this study, 89.1% of the participants stated that they heard about the hearing screening from the doctors in hospitals, 0.7% from their family or relatives, 1.5% from friends and 8.8% from other sources (including family doctors, school, pediatricians). Most of the participants (62%) said that they had not received any information prior to the hearing screening. The participants that had received prior information (38%) described the received written information regarding the sufficiency, difficulty and usefulness of the information as seen in table no. 1

The satisfaction with written information received prior of testing registered for a mean of 3.67 (the mean ranged from 2.57 to 4.39) and standard deviation of 2.19 (SD ranged from 0.97 to 1.48). Most of our participants (68.4%) responded agree or strongly agree to all the questions about the information prior of hearing testing.

The majority of our participants (92.7%) did not answer the question 6 (to give suggestions for improving the neonatal hearing screening), 3.6% stated that they had no suggestion for improving this programme, 2.9% suggested the importance of prior written information about the hearing screening and 0.7% said that media should spread the information about the Hearing Screening Programme.

After the hearing screening, 75.9% of the participants have passed the hearing tests, 18.2% failed the tests and only 5.8% did not know the results of the tests. The satisfaction regarding the personnel in charge with the hearing screening scored a mean value of 3.49 (the mean ranged from 1.28 to 4.88) and a standard deviation of 3.30 (SD ranged from 0.33 to 1.34).

## PUBLIC HEALTH AND MANAGEMENT

**Table no. 1. Satisfaction with the information received prior to the hearing screening (percentage value)**

	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
The content of the written information was sufficient.	2.9	2.2	1.5	17.5	16.8
The information about the neonatal hearing screening programme was difficult to understand.	13.1	10.2	5.1	5.8	6.6
The written information about the neonatal hearing screening programme was very useful.	1.5	1.5	0.7	13.1	24.1

**Table no. 2. Satisfaction with the medical staff responsible for hearing screening (percentage value)**

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
The tester did not give clear information about the next appointment.	54	16.8	5.1	2.9	5.1
Now that I had the appointment, I know what it must be done for my child's hearing.	1.5	5.8	23.4	53.3	83.9
The information received about the testing procedure was not sufficient.	65.7	21.2	5.8	2.9	4.4
The information about the test results was sufficient.	0.7	0.7	2.2	33.6	62.8
The tester had enough knowledge about the neonatal hearing screening programme.	0	0	2.2	27	70.8
The tester was skilful in using the equipment.	0	0	0	19.7	80.3
The tester was not approachable.	79.6	16.1	2.2	1.5	0.7
The tester was gentle with my child during the testing.	0	0	0	12.4	87.6

**Table no. 3. Satisfaction with appointment schedule (percentage value)**

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I was satisfied with the intervals between the appointments.	0.7	0.7	4.4	25.5	52.6
I had the opportunity to ask more about the neonatal hearing screening programme.	0.7	0	0.7	29.2	69.3
I had the opportunity to ask more about the test procedure.	0.7	0	0.7	27.7	70.8
I had the opportunity to ask more about the test results.	0	0	0	27.7	72.3
The length of the test session was not enough.	62.8	22.6	7.3	5.1	2.2
I was satisfied with the waiting time for the appointment.	2.9	2.9	5.8	30.7	57.7
The testing place was not suitable.	75.9	14.6	6.6	1.5	1.5

**Table no. 4. Overall satisfaction (percentage value)**

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
Overall I was satisfied with the neonatal hearing screening programme.	0	0	0.7	29.2	70.1
I was not satisfied with the test process.	81	16.1	2.9	0	0
I will recommend the neonatal hearing screening programme to my friends or relatives.	0	0.7	1.5	27.7	70.1
I will not use this service again.	83.9	16.1	0	0	0

Table no. 2 shows the results for satisfaction with the medical staff (questions 9 - 16). 61.3% of the participants responded as agree or strongly agree.

The results regarding the satisfaction with the appointment schedule, defined by the questions 8, 17 - 22, are best seen in table 3. The satisfaction with the appointment schedule has a mean value registered of 3.70 (the mean ranged from 1.38 to 4.72) and a standard deviation of 2.74 (SD ranged from 0.44 to 0.98). 67.4% of the participants responded agree or strongly agree to all the questions about the satisfaction with the appointment schedule.

For the overall satisfaction regarding the NHSP, which is best illustrated by the questions 23 - 26, we encountered a mean value of 2.93 (the mean value ranged from 1.16 to 4.69) and the standard deviation of 0.86 (SD ranged from 0.37 to 0.54). The answers reported by our participants are described in table 4. The percent of participants who responded agree or totally agree was high (98.5%).

As far as improving the written information on neonatal hearing screening, in our group only 10 participants had any suggestions: 4 participants (2.9%) suggested sending brochures, 1 participant (0.7%) said it would be important to receive information through the media and 3.6% 5 participants (3.6%) said that they had no suggestion to make.

52.6% participants choose not to answer the question 27a (to mention one aspect of satisfaction about this programme) and the rest of them were very pleased with the medical staff responsible for hearing screening, praising the amiability, training, attitude toward the child and parent, kindness and patience.

To question 27b (to mention one thing of dissatisfaction about the programme), 8.8% participants complained about the appointment schedule (2.1%), the lack of medical staff (0.7%) and the testing environment (2.1%).

5.7% of the participants suggested that this programme needs a waiting room for the children to be tested (0.7%), modern technology (0.7%), qualified staff (0.7%), better conditions for doctors (0.7%), bigger and a much functional testing space (2.9%).

### *Psychometric dimensions of the questionnaire*

Internal consistency is demonstrated by Cronbach's alpha coefficient. When calculating the Cronbach's alpha coefficient for the whole questionnaire, we obtained a value of 0.75, which reveals a good internal consistency. The four dimensions of the satisfaction have different values of Cronbach's alpha coefficient ranging from 0.56 to 0.81 (for overall satisfaction 0.57, for appointment schedule 0.81, for medical staff 0.56 and for information 0.67).

We applied Pearson's correlation coefficient for assessing construct validity of the PSQ-NHSP for the four dimensions of the questionnaire and obtained acceptable positive values of correlation: the overall satisfaction is significantly correlated with the satisfaction with the medical staff ( $r=0.28$ ,  $p=0.001$ ) and the appointment schedule ( $r=0.239$ ,  $p=0.005$ ). When correlating the satisfaction with the information with the satisfaction with the appointment schedule we obtained a moderate positive value of correlation ( $r=0.362$ ,  $p=0.006$ ), and strong values of correlation between the satisfaction with the medical staff responsible for testing with the satisfaction with the appointment schedule ( $r=0.704$ ,  $p=0.005$ ).

Test – retest reliability was assessed by Spearman's rank correlation coefficient with very strong and significant correlation for the overall satisfaction ( $r=0.88$ ,  $p=0.00001$ ), strong and significant correlation for the satisfaction with the medical staff ( $r=0.69$ ,  $p=0.0002$ ) and the satisfaction with the appointment schedule ( $r=0.66$ ,  $p=0.005$ ). We found very strong correlation for the satisfaction with the information ( $r=1$ ).

### DISCUSSIONS

The main goal of neonatal hearing screening programme is to early and completely detect hearing loss in children in order to proceed to early and properly hearing rehabilitation to ensure a normal development of speech and language.

There is no perfect hearing screening programme and the protocol is yet the subject of numerous discussions because even though there are different techniques for neonatal hearing screening, no method is 100% sure.

Many countries have adopted the neonatal hearing screening.(25) Yet the biggest success was recorded in Poland, where 99% of the newborn population has been screened for hearing loss.(26)

As far as our knowledge there is little written information on infant hearing screening available prior to birth, that would explain why most of our participants heard about this programme from doctors in hospitals. A large percent of our participants were satisfied with the content of written information (68.4% responded agree or strongly agree at questions about the information prior of hearing testing), result smaller than the result in the studies of Nunez et al. (2009) (19) and Mazlan et al. (2006) (18), although only a few of our participants had received written information about the hearing screening programme (38%).

On the other hand, the study of Russ et al. (2004) stated that it is unclear how helpful the information leaflets really were.(27)

Information of the parents is considered to be a mean of improving the neonatal hearing screening programme because parents should be aware of the risk factors and the benefit of early diagnosis and hearing rehabilitation.(28)

Our study revealed that participants were satisfied with the medical staff responsible for testing the child (61.3%), result that is similar to others studies.(18,19) As registered by the answer at question 27a, the participants of our study were pleased with the medical staff responsible for hearing screening, praising the amiability, training, attitude toward the child and parent, kindness and patience. Parents need professional support (good communication, empathetic attitude, adequate time for testing and delivery of the results) during screening and diagnostic testing. There are studies that report a negative impact on child care if communication difficulties and misunderstandings with the medical personnel exist.(27) Satisfaction with the medical personnel is one of the keys of a successful hearing screening programme because it essentially

influences the parent's compliance.(29)

Our study registered higher scores for satisfaction with appointment schedule (67.4%) than the others (the Persian version 58%) (20), but smaller than the study of Mazlan et al. (2006) (more than 95%).(18) Although most of our participants were satisfied with the appointment schedule, some participants complained about the appointment schedule (difficulty of making an appointment, no waiting room for the children to be tested).

The participants of our study reported higher levels of overall satisfaction (98.5%) with the NHSP than in other studies: Mazlan et al. (2006) (95%) (18), Nunez-Batalla et al. (2009) (more than 90%) (19), Shojaei et al (2013) (90.6%) (20), Mazlan et al. (2014) (more than 80%).(30) In general the NHSP is well received by the parents although associated with an unavoidable level of anxiety.(31) There is not sufficient evidence that hearing screening would cause any harm. There are studies that demonstrated that there is no increased maternal anxiety after applying the hearing screening or that the relationship between mother and newborn is affected.(32) The study of Crockett et al (2005) shows that the mothers whose babies were screened for hearing loss were significant more satisfied, regardless of the result received.(33) Another study showed that the overall satisfaction varied with individual experience, but surprisingly no parent made any negative comments about the overall process.(27)

As far as the psychometric dimensions of the questionnaire, our study showed a good internal consistency (Cronbach's alpha coefficient of 0.753) according to the rules of Colton.(34) The original English version of the PSQ-NHSP, developed by Mazlan et al. (2006) has a Cronbach's alpha of 0.94 (18), the Spanish version has a Cronbach's alpha of 0.75 (19) and the Malay version has a Cronbach's alpha of 0.90.(30) When assessing the construct validity, our study showed the existence of acceptable and positive significant correlations between the overall satisfaction with the two dimension of the questionnaire (the satisfaction with the medical staff and the satisfaction with the appointment schedule), and positive significant correlations between the four dimensions of the questionnaire (moderate correlation between the satisfaction with the information with the satisfaction with the appointment schedule, strong correlation between the satisfaction with the medical staff with the satisfaction with the appointment schedule).

In our study, parents gave almost the same answers when retested that would explain the strong test-retest reliability over a period of 30 days. The original English (18) and the Malay version (30) of the PSQ-NHSP showed excellent test-retest reliability, the Spanish (19) and the Persian version (20) indicated a moderate reliability.

In our opinion the success of the NHSP is directly dependent on parent compliance as well as the medical staff responsible for the screening tests, good communication between these two sides being essential.

### CONCLUSIONS

The PSQ-NHSP translated in Romanian proved to be a valid and reliable instrument of assessing parent satisfaction with the hearing screening programme, as well as the original, the Spanish, the Persian and the Malay versions.

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