

Does Anxiety Affect Timely Follow-Up After Newborn Hearing Screening?

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ABSTRACT

Purpose: To examine factors influencing follow-up time after a failed newborn hearing screen for babies in Missouri.

Method: The effects of parental anxiety, demographics, and counseling received on timely follow up after a failed newborn hearing screen were probed by surveying families of babies that failed the initial newborn hearing screening.

Results: Families who did not follow up by three months were compared with those who did. Families that did not follow up in a timely manner tended to experience lower anxiety about the test results than those that followed up within 3 months. Additionally, a large percentage of families left the hospital with the impression that it was unlikely that their baby had a hearing loss, even though the baby failed the screen.

Conclusions: Results highlight the importance of counseling prior to hospital discharge.

INTRODUCTION

Babies that fail the initial newborn hearing screen should be rescreened by one month of age. Audiological and medical evaluations to confirm the presence of hearing loss should be conducted by three months of age, so that intervention can be implemented by six months of age¹.

Missouri Statutes require all newborns delivered on or after 1/1/2002 to have a hearing screen. Missouri Code of State Regulations states that all infants that require follow-up should receive a diagnostic audiological assessment by three months of age². Statistics reported by the MO Dept of Health and Senior Services state that for the year 2008, 55.6% of Missouri babies were lost to follow-up.

Studies of other newborn hearing screening programs have identified factors such as socio-economic status, access to medical care, and the way in which information is communicated as having an impact on follow-up rates³⁻⁵. Results are mixed regarding the amount of maternal anxiety experienced after a referral during the newborn hearing screen^{6,7}.

The aim of this study was to identify factors that influenced timely follow-up after the initial hearing screening was failed. It was hypothesized that families that did not seek follow-up in a timely manner (1) did not fully understand the results, (2) experienced less anxiety than counterparts that sought follow up in a timely manner, and (3) were different demographically than those that followed up in a timely manner.

MATERIALS & METHODS

A survey was developed by the authors to gather (a) demographic data, (b) information about parental understanding of the screening process and the results, and (c) information regarding parental anxiety about the hearing screening. The survey included questions modified from other studies^(8,9) as well as original questions created specifically for the current study. All eligible families were mailed a copy of the survey and an informed consent, along with a letter explaining the purpose of the study. Families received the surveys shortly after hospital discharge.

Participants were families of infants born in Missouri who failed their initial newborn hearing screening between November 2008 and May 2009. Babies selected for inclusion did not have any risk factors for hearing loss. Approximately 1600 babies fell into this category. Surveys were mailed to families within about 2 months of the baby's birth. After responses were received, participants were divided into two groups: Group 1 was comprised of infants who received follow-up services by three months of age; Group 2 consisted of infants that did not receive necessary follow-up services by 3 months of age. Group assignment was determined by consulting Missouri's web-based tracking module "Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC)" three months after the child's initial hearing screening was administered.

RESULTS

1600 families were invited to participate. 161 surveys meeting inclusion criteria were returned. Of those, 121 were classified as Group 1 (followed up within 3 months) and 40 were classified as Group 2 (did not follow up by 3 months). **Table 1** displays the demographic composition of the respondents. **Table 2** displays responses of participants when asked to report their understanding of the results of their baby's hearing screen. Most did not believe their baby had a hearing loss.

Participants were asked to describe the level of anxiety they felt when they found out their baby needed a hearing screen, after learning the results of the test, and regarding the re-evaluation. Responses to these scores were collapsed to create a "general anxiety" score (See **Figure 1**). Specifically, participant feelings about having their baby's hearing retested are displayed in **Figure 2**. Most reported feeling anxious about the retest.

To further investigate the impact of feelings of anxiety on timely follow up, participant responses were recoded into "anxious" or "not anxious" and a chi square analysis was conducted. Results indicated that those respondents that reported more anxiety were more likely to follow up in a timely manner than those that lacked anxiety ($p = .036$).

The effect of maternal age on timely follow up was also investigated. Mothers between the ages of 18 – 25 years of age were the least likely to follow up in a timely manner. See **Figure 3**.

Table 1
Maternal Demographic Composition of Survey Respondents as a Function of Group.

	Group 1 (n=121)	Group 2 (n=40)
Age		
<18 years	8	4
18-25 years	41	21
26-35 years	61	12
>35 years	11	3
Race/Ethnicity		
White/non-Hispanic	100	33
Hispanic	8	0
African American	9	6
Asian	2	1
Other	2	0
Education		
High School or Less	53	27
Beyond High School	68	13
Marital Status		
Married	89	24
Single	29	16
Divorced	3	0

Table 2
Results of Initial Hospital Hearing Screening as Understood by Respondent as a Function of Group

Statement	Frequency	Percent	Follow Up in 3 Months	
			Yes	No
Baby did not have a hearing loss	52	32.3	42	10
Hearing loss possible, but not likely	65	40.4	49	16
Hearing loss possible	23	14.3	19	4
Hearing loss very likely	1	.6	0	1
Baby had a hearing loss	2	1.2	0	2
Did not understand results	11	6.8	5	6

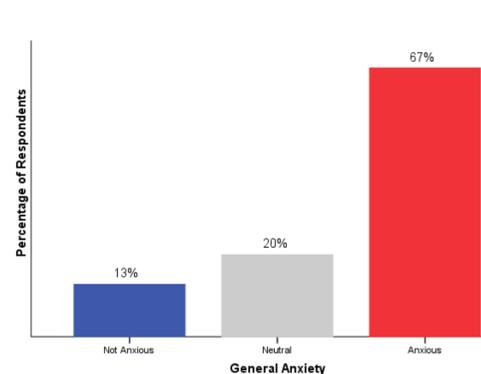


Fig. 1: General anxiety reported by participants.

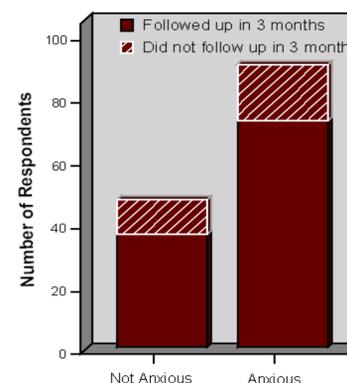


Fig. 2: Number of participants following up in a timely manner as a function of anxiety levels.

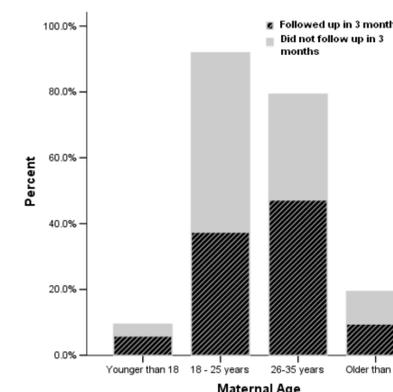


Fig. 3: Number of participants following up in a timely manner as a function of maternal age.

CONCLUSIONS

• Respondents were pleased with the newborn hearing screening process, and felt that their questions were answered and that they were given the necessary information to assist them in taking the next step.

• Many families did not believe it likely that a hearing loss was present (Table 2). Further investigation is needed to determine if this influences follow up time. It seems evident that the counseling that the family receives before leaving the hospital has the most impact on their decision to seek services in a timely manner.

• Respondents reported a high level of anxiety when being informed of the results of the initial hospital hearing screening and concerning the retest. Those that reported higher anxiety levels were more likely to follow up in a timely manner. Others have shown that "mild concern" during the hearing screening may be beneficial to improving follow-up rates⁶.

• Trends were observed in regards to maternal education and maternal age; however, generalization of these findings is limited. The data suggests that younger mothers were less likely to follow up in a timely manner. However, an effect of education level cannot be ruled out as young mothers have not had the opportunity to further their education due to age. These findings suggest that younger mothers need more information and counseling when the results of the hearing screening are being given, but further analysis needs to be done in this area.

• Take home message: Families must understand the importance of timely follow up and should not be given the impression that their baby does not have a hearing loss, even though they failed the newborn screen. Further, a certain amount of anxiety appears to motivate families to follow up in a timely manner.

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