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ORIGINAL ARTICLE

EDUCATIONAL ACTIONS AND ADHERENCE TO AUDIOLOGICAL MONITORING OF NEONATES AND INFANTS

AÇÕES EDUCATIVAS E A ADESÃO AO ACOMPANHAMENTO AUDIOLÓGICO DE NEONATOS E LACTENTES

ACCIONES Y INSCRIPCIÓN PARA LA EDUCACIÓN AUDIOLÓGICA DE RECIÉN NACIDOS Y LACTANTES

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ABSTRACT

Objective: to verify ratio between hearing health education and adherence to audiological monitoring. ***Method***: this is an observational, analytical and longitudinal prospective study with 188 mothers of newborns and infants treated at the Children's Hearing Health Programme, born in the period from June to November 2011 and referred for audiological monitoring. ***Results***: it was observed that 29.8% (n = 56) of the mothers joined the audiological monitoring, with 62.0% (n = 31) of those reporting having received at least one guidance on hearing health. Educational actions were significantly associated with adherence. Among the socioeconomic and demographic indicators, the 'place of residence' showed significant association in relation to adherence. ***Conclusion***: the presence of risk factors and the outcome 'failed' on screening did not affect the adhesion. Educational actions were proven effective for improving mothers' adherence to audiological monitoring. ***Descriptors***: Health Education; Hearing; Neonatal Screening; Newborn; Nursing.

RESUMO

Objetivo*:** verificar relação educação em saúde auditiva e adesão ao acompanhamento audiológico. ***Método*:** trata-se de uma pesquisa observacional, analítica e longitudinal prospectiva, com 188 mães de neonatos e lactentes atendidos no Programa de Saúde Auditiva Infantil, nascidos no período de junho a novembro de 2011 e encaminhados para acompanhamento audiológico. ***Resultados*:** pôde-se observar que 29,8% (n=56) das mães estudadas aderiram ao acompanhamento audiológico, com 62,0% (n=31) destas relatando ter recebido ao menos uma orientação sobre saúde auditiva. A ação educativa esteve associada significativamente à adesão. Dentre os aspectos socioeconômicos e demográficos, a 'região de moradia' apresentou associação significativa em relação à adesão. ***Conclusão*:** a presença de indicadores de risco e o resultado 'falha' na triagem não influenciaram a adesão. A ação educativa mostrou-se efetiva para melhorar a adesão das mães ao acompanhamento audiológico. ***Descritores: Educação em Saúde; Audição; Triagem Neonatal; Neonato; Enfermagem.

RESUMEN

Objetivo*:** analizar la relación la educación sanitaria y la vigilancia del cumplimiento de audiología audiencia. ***Método*:** se trata de una investigación observacional, analítico y prospectivo longitudinal con 188 madres de los recién nacidos y los lactantes atendidos en el Programa de Salud para Niños Audiencia, nacida en el período de junio a noviembre de 2011 y remitido para audiológica. ***Resultados*:** se observó que el 29,8% (n = 56) de las madres se unieron al audiológica, con 62,0% (n = 31) de los que reportaron haber recibido al menos una orientación sobre la salud auditiva. La actividad educativa se asoció significativamente con la adherencia. Entre los indicadores socioeconómicos y demográficos, el «lugar de residencia» mostraron asociación significativa con relación a la adherencia. ***Conclusión*:** la presencia de factores de riesgo y de resultado "no" selección no afecta a la adherencia. La actividad educativa se ha demostrado su eficacia para mejorar la adherencia a las madres audiológicos. ***Descriptores: Educación en Salud; Audición; Tamizaje Neonatal; Recién Nacido; Enfermería.

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INTRODUCTION

The development of hearing starts from intrauterine life and is developed through gradual stages of complexity. Thus, a child must be able to detect, locate, distinguish, memorize, recognize and understand sounds, in order to acquire language and develop speech. The interruption of any of these steps can cause significant functional impairment in child development. Therefore, measures should be taken so that the difficulties arising from a sensory deprivation can be minimized as soon as possible. Hence it is necessary to identify hearing loss in a neonate in their first month of life, even if it does not show in their historical risk indicators for the likelihood of this condition occurring.[1]

The first six months of an infants' life are decisive for their future development, and that's why audiologists, otolaryngologists and pediatricians have been concerned with the promotion of public awareness campaigns for both parents and health professionals about the importance of early diagnosis and identification of hearing loss, followed immediately by medical intervention and speech therapy[1]. When it comes to health professionals' awareness, it is important to consider all health professionals involved with the care of the neonate and infant, especially nursing professionals, due to their close proximity with the population and their care based practice.[2]

The National Policy on Hearing Health Care[3] allows comprehensive care to people with hearing loss, through actions that involve primary care (actions to promote health, prevention and early identification of hearing problems), average complexity (screening and auditory monitoring) and high complexity services (specialized diagnostic and therapeutic), with the provision of hearing aids and speech therapy.[3]

The latest publication of the Joint Committee on Infant Hearing (JCIH), an international committee on childhood hearing loss, recommends the use of the physiological processes of Evoked Otoacoustic Emissions (EOE) and Auditory Evoked Potentials (AEP) for screening hearing of newborns. However, for neonates without risk indicators for hearing loss, either method is considered appropriate. In the at-risk population, if the AEP is used, in addition to cochlear hearing loss, it is possible to identify neural hearing disorders such as auditory neuropathy spectrum disorder (ANSD). This committee also comments that some services use the EOEs records for the initial screening, and in case of failure, the AEP is used in the second stage, reducing the occurrence of false positives and the need for audiological monitoring.[4]

The follow-up to families of infants who do not pass the first evaluation and their awareness about the importance of early detection of hearing loss and its consequences may contribute to an increase in adherence to the second stage of the hearing health evaluation.[5]

At the Federal University of Pernambuco Hospital (HC/UFPE), there is a low rate of returns for examination after the hearing screening, or in other words, low adherence of families to audiological monitoring when needed. Therefore, in order to know the factors that are associated with families' adherence to audiological monitoring and especially to evaluate the importance of educational activities provided by health professionals for this adherence, it was decided to develop a survey aiming to verify the relationship between educational actions on hearing health and adhesion of mothers of newborns and infants to audiological monitoring.

METHOD

This is an observational, analytical and prospective longitudinal study conducted in the Child Hearing Health Programme of HC/UFPE in the city of Recife, which involves: (1) the Newborn Hearing Screening service (NHS) and (2) the Otorhinolaryngology Clinic.

The HC/UFPE Child Hearing Health Programme begins in the NHS service. There, hearing screening is performed by EOE tests and filling out a form, which contains information about: (a) the newborn's mother personal data, (b) socioeconomic and demographic aspects of their families, (c) risk indicators for hearing loss, (d) the results of tests performed, and (e) any form of hearing health education received from health professionals, in their lives, whether in prenatal consultations, maternity ward, etc.

In the Otorhinolaryngology clinic, EOE and AEP tests are conducted for the audiological monitoring of neonates or infants. A questionnaire relating to the receiving of any (or any more) hearing health education actions from health professionals, from the moment of hearing screening to the audiological consultation, was complemented at the time of returning for undergoing the exams, in order to meet the objectives of this research.

At the HC/UFPE Children's Hearing Health Programme, referral for audiological

monitoring can occur in two different situations, described below.

(1) When the newborn gets a 'failed' hearing screening: these neonates should be retested by EOE, so the results obtained in the initial hearing screening can be confirmed or refuted. The subsequent step depends on the result in this retest: (a) if the result is a confirmed 'failure', the infant is referred for further examination of audiological monitoring, this time by AEP tests; (b) if the result obtained is 'pass', neonates only return for another exam if risk indicators for hearing loss are present.

(2) When the newborn's results is a 'pass' in the hearing screening, but presents risk indicators for hearing loss: these neonates should be tested by AEP at another time so an audiological diagnosis of the possibility that progressive hearing loss may one day manifest can be obtained, which could not yet be detected by examining at the time of the EOE hearing screening. The subsequent step also depends on the result of this audiological monitoring examination: (a) if 'changed' result is obtained, the infant is referred to intervention services in the region; (b) if there is a 'normal' result, they are discharged from the neonate programme.

In this study, each family's return after the initial hearing screening was called audiological monitoring, for conducting the EOE or AEP tests, and in each of these visits, mothers were questioned again about receiving any hearing health education actions from health professionals to complete the form. Therefore, the mothers were interviewed at various times.

The sample was 188 mothers of newborns and infants who underwent hearing screening programme at the HC/UFPE Children's Hearing Health Programme, born between June and November 2011, and had been referred for audiological follow-up.

To calculate the sample, the study population was considered as all mothers of newborns and infants referred for audiological monitoring in the period studied (368 cases). Considering an expected prevalence of return, or adherence to audiological monitoring, of 50% (p=0.5), a margin of error of 5% (e=0.05), confidence level of 95% and total population of 368, the sample size of the study (n=188) was calculated to be representative of the population.

For data analysis, a database was built using the Statistical Package for Social Sciences software, version 13.0, with double entry, to enable data validation for greater reliability. The following variables were analyzed: (a) adherence to audiological monitoring; (b) socioeconomic and demographic indicators; (c) presence of risk factors for hearing loss; (d) result of 'failure' in newborn hearing screening and (d) presence of hearing health education actions. The percentage frequencies were calculated and their respective frequency distributions were built in relation to adherence to audiological monitoring. In order to assess the factors associated with adherence to audiological monitoring, the chi-square test for independence was applied. In cases where the assumptions of the chi-square test for independence were not met, the Fisher's exact test was used and a significance level of 5% was considered. In the variables that appear as significant for adherence to audiological monitoring, the prevalence ratio was calculated with the purpose of quantifying the difference in adherence rate among the characteristics of the mothers.

This work is part of the research 'HC/UFPE Neonatal Hearing Screening Programme', approved by the Ethics Committee on Human Research of the UFPE Centre for Health Sciences under nº 160/07, CAAE 0158.0.172.000-07, according to resolution nº 196/96 of the National Health Council.

At the Hearing Health programme HC / UFPE, upon realization of NHS, the mother is invited to participate in the survey and confirms their participation by signing the Informed Consent Form (ICF).

RESULTS

To meet the objective of this study: (1) the adherence of mothers of newborns and infants audiological monitoring was verified; (2) the occurrence of hearing health education actions aimed at mothers of newborns and infants was identified; (3) professionals who performed actions in hearing health education to mothers of newborns and infants were identified; (4) significant association between adherence to audiological monitoring and the presence of health education actions hearing conducted by health professionals to mothers of newborns and infants was verified; and (5) significant association between adherence to audiological monitoring and the socioeconomic and demographic indicators, the presence of risk factors in neonates and 'failure' in hearing screening of newborns was verified.

Among the data in Table 1, demographic and socioeconomic characteristics of the study population can be observed. It is worth noting that 71.8% (n=135) of mothers reside in the metropolitan Recife area; 90.4% (n=169) have

1-3 children; 8.0% (n=15) have 4-6 children and 1.6% (n=3) have seven or more children; 55.4% (n=102) of mothers have no personal income, although 23.4% (n=43) receive less than 1 minimum wage and 21.2% (n=39) have personal income 1-3 times the minimum wage. However, the analysis of household income shows that 24.3% (n=44) receive less than the minimum wage, 68.0% (n=123) have a household income of 1-3 times the minimum wage and 7.7% (n=14) receive more than 3 minimum wages. Regarding educational level, 2.1% (n=4) of the mothers are illiterate, 31.9% (n=60) attended elementary school, 62.8% (n=118) had high schooling and 3.2% (n=6) have reached the tertiary education.

Table 1. Results of analysis of the association between adherence to audiological monitoring and the socioeconomic and demographic indicators, the presence of risk factors and outcome 'failure' in newborn hearing screening. Recife, 2011.

Variable	n	%	Adherence to monitoring		p-value
			Yes	No	
Area of residence					
Recife Metropolitan area	135	71,8	49 (36,3%)	86 (63,7%)	**0,002[1]**
Countryside	53	28,2	7 (13,2%)	46 (86,8%)	
Age					
Up to 19	46	24,5	16 (34,8%)	30 (65,2%)	0,667[1]
20 to 34	126	67,0	35 (27,8%)	91 (72,2%)	
35 or over	16	8,5	5 (31,2%)	11 (68,8%)	
Number of children					
1 - 3	169	90,4	53 (31,4%)	116 (68,6%)	0,510[2]
4 - 6	15	8,0	3 (20,0%)	12 (80,0%)	
7 or more	3	1,6	0 (0,0%)	3 (100,0%)	
Occupation					
Worker	63	34,6	21 (33,3%)	42 (66,7%)	0,161[1]
Student	17	9,3	8 (47,1%)	9 (52,9%)	
Neither	102	56,0	26 (25,5%)	76 (74,5%)	
Marital status					
Common-law marriage	76	40,4	19 (25,0%)	57 (75,0%)	0,095[2]
Single	60	31,9	16 (26,7%)	44 (73,3%)	
Married	48	25,5	20 (41,7%)	28 (58,3%)	
Separated	3	1,6	0 (0,0%)	3 (100,0%)	
Widow	1	0,5	1 (100,0%)	0 (0,0%)	
Personal income					
Does not have	102	55,4	30 (29,4%)	72 (70,6%)	0,651[1]
Less then 1 minimum wage	43	23,4	15 (34,9%)	28 (65,1%)	
1 - 3 minimum wages	39	21,2	10 (25,6%)	29 (74,4%)	
Household income					
Less then 1 minimum wage	44	24,3	9 (20,5%)	35 (79,5%)	0,235[1]
1 - 3 minimum wages	123	68,0	42 (34,1%)	81 (65,9%)	
Over 3 minimum wages	14	7,7	4 (28,6%)	10 (71,4%)	
Educational level					
Illiterate	4	2,1	0 (0,0%)	4 (100,0%)	0,439[2]
Elementary School	60	31,9	15 (25,0%)	45 (75,0%)	
High School	118	62,8	39 (33,1%)	79 (66,9%)	
Tertiary education	6	3,2	2 (33,3%)	4 (66,7%)	
Presence of risk indicators					
Yes	88	46,8	24 (27,3%)	64 (72,7%)	0,479[1]
No	100	53,2	32 (32,0%)	68 (68,0%)	
Screening results					
Pass with risk indicator	9	4,8	5 (55,6%)	4 (44,4%)	0,129[2]
Fail	179	95,2	51 (28,5%)	128 (71,5%)	

[1] p-value of chi-square test for independence (if p-value <0.05 the evaluated factor is determinant for adherence to treatment). [2] p-value of Fisher's exact test.

Figure 1 shows the results regarding mothers' adherence to audiological monitoring, where it can be seen that only 29.8% (n=56) adhered to monitoring.

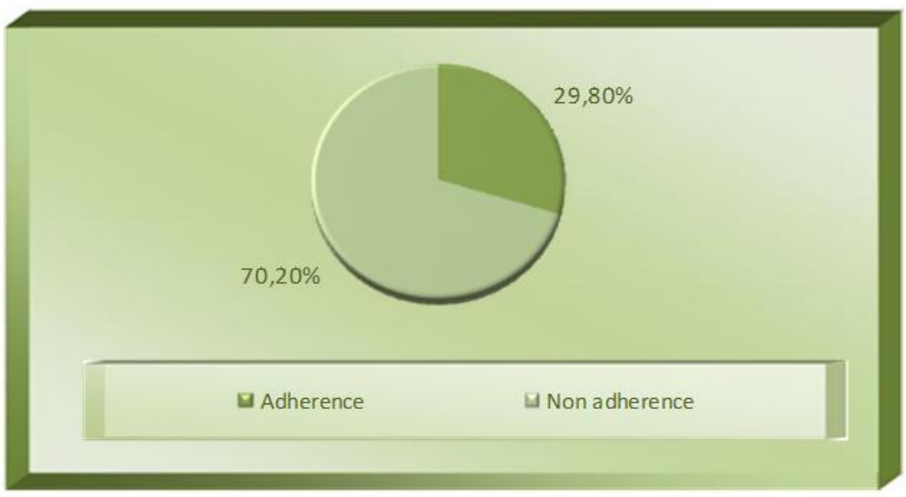

Figure 1. Adherence of mothers of newborns and infants to audiological monitoring. Recife, 2011.

Table 2 refers to the association between adherence to audiological monitoring and the presence of educational actions on hearing health. Among other factors, it was observed that, to the moment of the return for audiological monitoring, 26.6% (n=50) of the mothers had received at least one orientation. It can also be observed that the practice of educational activities is a significant factor for adherence to follow-up (p-value <0.001). Also, the prevalence ratio of adhesion between the group that received education and the one which hadn't was equal to 3.4 (62.0/18.1), indicating that mothers who have undergone education adhere to monitoring 3.4 times more often than mothers who did not undergo educational activities.

Table 2. Association between adherence to audiological monitoring and the presence of educational actions on hearing health. Recife, 2011.

Presence of educational actions	N	%	Adherence to monitoring		p-value
			Yes	No	
Yes	50	26,6	31 (62,0%)	19 (38,0%)	<0,001[1]
No	138	73,4	25 (18,1%)	113 (81,9%)	

[1]p-value of chi-square test for independence (if p-value <0.05 the evaluated factor is determinant for adherence to treatment).

Table 3 has the results of the professionals who were reported as having performed educational activities. It can be observed that professional nurses were the most cited, reported by 33.3% (n=18) of mothers, followed by other professionals such as doctors, reported by 31.5% (n=17), audiologists by 11.1% (n=6), community health agents (CHA) by 3.7% (n=2), while the remaining (3.7%, n=2) did not know or remember which professional had performed the action, and 16.7% (n=9) were instructed by other means.

Table 3. Identification of professionals reported to have carried out educational activities. Recife, 2011.

Professionals who carried out educational activities	n	%
Nurse	18	33,3
Doctor	17	31,5
Speech Therapist	6	11,1
CHA	2	3,7
Doesn't know / remember	2	3,7
Others	9	16,7

Other aspects that could influence adherence to audiological monitoring were analyzed, from associations between adherence to audiological monitoring and: (1) socioeconomic and demographic indicators, (2) the presence of risk factors for hearing loss in newborns and (3) a 'failure' outcome in newborn hearing screening.

Among the socioeconomic and demographic indicators analyzed ('area of residence', 'mother's age', 'number of children', 'occupation of the mother', 'marital status of the mother', 'personal income of the mother', 'income' and 'education level of the mother'), only the variable 'area of residence' showed a statistically significant result (p-value=0.002) in relation to adherence to audiological monitoring (Table 1). Furthermore, the prevalence ratio of adhesion between the group who lives in the metropolitan area and that lives outside it was equal to 2.7 (36.3/13.2), indicating that mothers who are in the metropolitan area adhere to the monitoring 2.75 times more than mothers who are outside.

The presence of risk factors and a hearing screening 'failure' result had no statistically significant association in relation to adherence to audiological monitoring (Table 1).

DISCUSSION

In this study, it was observed that the percentage of adherence to audiological monitoring is less than the adherence rate described in other studies, as discussed below.

In a project developed in the community[8], adherence to audiological monitoring was observed in 40.61% of households. In another study[6], it was seen that 19.4% of families were asked to come back for hearing evaluation, however only 58.8% of them adhered to this monitoring.

Françazo and colleagues (2010)[5] found that 8.2% of infants who participated in newborn hearing screening had a 'failed' result in hearing screening, being referred to audiological monitoring. Of all infants referred, 79.34% returned, which is an adherence rate still considered inappropriate for audiological follow-up.[1]

A study[9] with families of infants who were referred for audiological monitoring showed that 98% of families reported this monitoring to be important, but adherence to follow-up was low. Thus, these authors observed inconsistency between knowledge and adherence to audiological monitoring, since the families did not appear for the exam, despite its importance.

This disparity between the rate of adherence to audiological monitoring of this study compared to other studies in the literature in question may be due to the fact that some programmes have a good link between the neonatal hearing screening programme and social care services in hospitals in a particular region, that provide, for example, aid to transport the family from their residence to the place of examination. Another feature that may have served as a strategy for adhesion to audiological monitoring is scheduling the test for the same day of the family's return for the Guthrie Test. This makes the family's return to the health service more useful, as a single visit will serve two distinct health purposes. Since these two aspects are lacking in the hearing health program analyzed in this study, one can justify the low adherence to audiological monitoring with bases in disjointed health actions.

Adherence to audiological monitoring is a key quality indicator for the success of children hearing health programmes[1,4]. This is justifiable, because not returning to audiological monitoring postpones the diagnosis of hearing loss, jeopardizing the start of the intervention in an appropriate period[6]. For a programme to be considered of good quality, national and international committees that discuss hearing loss in childhood recommend that the hearing screening should be performed on at least 95% of newborns, and among those who obtain the 'failure' result, at least 90% must be submitted to audiological evaluation to make the diagnosis by the third month of life.[1, 4]

When the above recommendations are followed, the development of understanding and expression of language, as well as social relationships and academic performance of children with hearing loss may be compatible with hearing children of the same age.[7]

Although the children hearing health programmes try to follow the recommendations and achieve adequate rates of adherence, there has been instances of great difficulty in coping with this issue in the health services. Thus, achieving adequate adherence rates of audiological monitoring in families constitutes an ongoing challenge.[9,10]

Despite the high rate of absence in audiological monitoring being indicated as the main problem in the effectiveness of newborn hearing screening programmes, little is known about the reasons for non-attendance, because there are few studies for this purpose, especially in developing countries.[6]

The search for other factors that might contribute to the non-attendance of the family to the follow-up consultation (audiological monitoring) may result in recommendations and actions being implemented in order to promote the adhesion required to complete all stages of a child hearing health programme[6]. In this study, the following categories are highlighted: (1) lack of knowledge about the hearing screening, (2) financial difficulties, (3) difficulty in reconciling the schedule with the family routine, (3) lack of interest, (4) lack of scheduling, (5) emotional factors, (6) lack of guidance to families on the part of health professionals about the importance of hearing and the issues involved with child hearing health.[9]

Some authors[6] have analyzed qualitatively the reasons why some mothers did not attend the audiological monitoring. Aspects were mentioned like forgetting the follow-up day, lack of guidance from health professionals about the importance of conducting hearing evaluation, lack of interest of health professionals on issues related to health impairment, difficulty in commuting between the place of residence and the place where audiological monitoring is carried out. Based on the results described[6], it is understood that health professionals have an important role in adherence to audiological monitoring because their posture and recommendations regarding the need for hearing assessment seemed to positively or negatively influence the return of the mother-infant dyad in some programmes.

The effectiveness of a Children's Hearing Health Programme, regarding the detection and diagnosis of hearing disorders as early as possible and prompt inclusion of infants in specific rehabilitation programs, depends not only on existing technology, but also on health professionals qualified to perform the tests, for the provision of services, and especially for conducting and supporting guidance on the involvement and participation of family members throughout the process which involves a programme of children's hearing health.[10]

Family participation is necessary both for the infant to be taken to the location where

testing will take place, as for, in case of detection of hearing loss, family orientation and integration into rehabilitation programmes. However, family involvement is considered unsatisfactory due to lack of guidance from professionals who deal with this population.[10]

This guidance role can extend especially to nursing professionals, since they are health professionals who are in direct contact with the population, either in health centres, such as hospitals and clinics, or in family health programmes.[2]

Thus, it is important to: (a) guide families during the gestational period on the importance of hearing screening before the first month of the baby's life, (b) guide families through providing printed educational material, still at the maternity ward, (c) reconcile schedules of audiological monitoring follow-ups with other tests, and (d) empower health professionals to include the importance of hearing evaluation in their orientations.

In addition to the actions described, the role of community health workers may also represent an important option to minimize the evasion of audiological monitoring. However, for this action to be effective, the health system must be alert to performing actions of continuing education for all professionals involved with the care given to the children. This type of operation has been described as promising in the rescue of families who do not attend the proposed schedules.[9]

However, in order for health professionals being able to act in guiding families on the prevention, identification of late or acquired hearing loss and family support for adherence to (re)habilitation process, it is necessary that specific information about children's hearing health is provided[11], since this issue is not necessarily covered in the training of these professionals. Thus, it is essential to educate them about the causes and types of hearing loss, the development of hearing and language in hearing children, the impact of hearing loss on the biopsychosocial development of children and the possibilities for identification, diagnosis and intervention.[2]

The realization of these educational interventions for child hearing health promotion, from prevention to identification of hearing problems as early as possible, as well as informative, educational and family counselling actions can be performed within the reality of Children's Hearing Health Programmes in developing countries.[6]

In this study, nurse practitioners, followed by medical professionals, were most commonly cited by the population as those who provided health education actions by the mothers surveyed. Professional audiologists and community health workers followed, with less expressive percentages. This reinforces the importance of having continuing educational actions at all levels of health care. Moreover, it was observed that the presence of actions in hearing health education proved to be influential to the adherence of mothers to audiological monitoring, indicating that these actions can benefit the effectiveness of the Children's Hearing Health Programme.

Audiologists, by the type of care attributed to them in the hearing health service, that of conducting examinations, spend less time with the newborn and their family than the doctors and nurses who perform periodic consultations with this population, forming a bond and tracking their overall health. Perhaps for this reason, they have been the most referenced professionals as providers of health education actions to the population.

Nurses already provide, as the core of their profession, care to human beings[12], whether at the individual, family or community level, and can increase awareness in health promotion, prevention of diseases, and recovery and rehabilitation.[13]

Among those involved in the care process, besides health professionals are the users and the family. Nursing care should be family-centred, understanding that this is essential in the care of its members and that it influences the health of the patient, being a partner in improving practices and system of care.[14]

In 2007, the influence of the doctor's or nurse's guidance in the need for audiological tests was studied and proven to motivate mothers to seek the hearing evaluation service, even though they did not know well which test would be conducted and what their functionality was.[15]

In a study of doctors and nurses, it was observed that 100% of physicians surveyed reported having knowledge about hearing health of the neonate and infant. Of these, slightly more than half said they instruct families about hearing health of the newborn or infant during the prenatal or visit to the paediatrician. Among nurses, 78% reported having knowledge about the earliest possible detection of hearing loss, but all the nurses were unaware that 50% of children with hearing loss are not part of the group with the presence of a risk indicator.[16]

In a study[9] that addressed health education actions, it was observed that nurses, speech therapists and doctors were, respectively, the professionals who most often explained

hearing assessment to the families. The results also indicated that nurses were the most frequently cited as having guided these families. This study reinforces the idea that nursing professionals have more contact with families and they are the ones who have the opportunity to provide guidance on hearing health within the information in their professional routine. Thus, it emphasizes the need for such professionals have on-going education involving infant hearing health[9] so that they can include hearing health education in their day-to-day actions.

Moreover, even with the presence of health education actions in this study's programme, the percentage of adherence was lower than that reported in other studies[9]. In this scenario, the effective participation of multidisciplinary professionals who deal with newborns and infants could not only provide education to parents about the procedures for the hearing screening, but also to ensure that the hearing health programmes designed for this population are resolute. It is possible that educational strategies or methodologies used in health education activities carried out have not favoured the incorporation of meanings to newborn hearing screening, not affecting the behaviour of mothers.

This is corroborated by the statements of a survey[10] which relates that, in some cases, the lack of hearing does not constitute a problem that would require concern or research with specialized professionals. For mothers, their ability to assess hearing seems sufficient, through their empirical means, and believing that the child hears within the standards assessed by them as normal. It is suggested, therefore, that education and information are bases of a strategic plan that aims to transcend not only the resistance of individuals, but to encourage the active participation of users in health care.[10]

In this study, other factors were analyzed as possible interferences with the adherence to audiological monitoring, such as socioeconomic and demographic indicators, the presence of risk indicators or a 'failure' result in the hearing screening. Among these association verifications, the results indicated that only the demographic aspect 'area of residence' has influence in relation to adherence to audiological monitoring. This finding may suggest that lack of access to the Children's Hearing Health Programme may hinder the audiological diagnosis of infants, especially those families that reside outside metropolitan areas, as there is no adequate referral and counter-referral service.

Thus, one may suggest that the health system interferes with the process of accession to audiological monitoring, since the facilities for the hearing evaluation focus on the capital and on private services, which hinders the access of low-income population to the programmes.[6]

In most developed cities, as in the case of the city of Campinas, in São Paulo, the place of residence proved of little relevance in relation to adherence to audiological monitoring.[10]

A survey[6] conducted in the same region as this study points to the presence of risk indicators for hearing loss as one of the factors that seem to influence the adhesion of families to return to audiological monitoring. It also highlights the level of mother's education and number of children as factors that may be associated with this adhesion.

It is known that the introduction of Children Hearing Health Programmes in developing countries is still considered very low for a number of reasons, among them, the costs of hearing screening and audiological monitoring services[5]. Therefore, the offer of hearing screening in the Public Health System is still scarce, hampering people's access to this screening and audiological monitoring[6], even with the enactment of Law No. 12.303, which provides for the mandatory examination of EOAE in neonates and infants on the premises of public hospitals and maternity wards.[17]

Such a determination represents a major breakthrough in the hearing health of children. Thus, it is hoped that the auditory evaluation becomes an easily-accessible service to the entire community, with universal coverage.

Mothers whose children had a 'failure' result in the hearing screening could behave, in relation to adherence to audiological monitoring, differently to those whose children had a 'pass' result in the hearing screening, but who had risk factors for hearing loss, such that it could be that, by presenting a satisfactory result at the first examination, the neonate or infant would be free of hearing disorders. However it was noted that neither of these two cases was influencing the behaviour of mothers.

CONCLUSION

Adherence to audiological monitoring represents an important indicator of the effectiveness of Children's Hearing Health Programmes. In this study, the adherence of mothers to the audiological monitoring of neonates and infants was short of that

described in national and international literature.

As strategies to modify this reality, actions in hearing health education promoted by health professionals to attended mothers of newborns and infants were identified. In this study the actions of hearing health education were mostly realised by nurses. Despite interdisciplinarity being essential for the success of a Hearing Health Programme, we believe that professional nursing is a strong ally, owing to its primordial action in care.

Among the investigated factors that may influence adherence to audiological monitoring are the socioeconomic and demographic aspects of the population. The fact of residing in the metropolitan area in which the studied programme is implemented influenced adherence positively. The presence of risk factors and a 'failure' result in the hearing screening were not influencing the behaviour of mothers. However, regardless of these factors in this study, mothers who received educational actions adhered to audiological monitoring more often than mothers who did not. These results show that the actions of health education represent potential modifiers of population conduct regarding the hearing health of newborns and infants.

REFERENCES

1. Lewis DR, Marone SAM, Mendes BCA, Cruz OLM, Nóbrega M. Comitê multiprofissional em saúde auditiva - COMUSA. Braz J Otorhinolaryngol [Internet]. 2010 [cited 2011 Nov 15];76(1):121-8. Available from: http://www.saude.mg.gov.br/publicacoes/copy_of_treinapres/apresentacoes-do-ii-seminario-de-saude-auditiva-sus-mg/Comite%20multiprofissional%20em%20saude%20auditiv.pdf

2. Alvarenga KF, Bevilacqua MC, Martinez MANS, Melo TM, Blasca WQ, Taga MFL. Proposta para capacitação de agentes comunitários de saúde em saúde auditiva. Pró-fono (Online) [Internet]. 2008 [cited 2010 Dec 10];20(3):171-6. Available from: http://www.scielo.br/pdf/pfono/v20n3/06.pdf

3. Brasil. Ministério da Saúde. Portaria n. 2073 de 28 de setembro de 2004. Institui a Política Nacional de Atenção à Saúde Auditiva. [cited 2010 June 11]. Available from: http://dtr2001.saude.gov.br/sas/PORTARIAS/Port2004/GM/GM-2073.htm.

4. Joint Committee on Infant Hearing (JCIH). Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. Pediatrics [Internet]. 2007 [cited 2008 July 15];120(4):898-921. Available from: http://pediatrics.aappublications.org/content/120/4/898.full.pdf+html

5. Françozo MFC, Masson GA, Lima MCMP, Santos MFC. Adesão a um Programa de Triagem Auditiva Neonatal. Saúde Soc [Internet]. 2010 [cited 2009 June 10];19(4):910-18. Available from: http://www.revistas.usp.br/sausoc/article/view/29713/31588

6. Rangel SB, Ferrite S, Begrow DV. Fatores que influenciam a não adesão ao retorno para a triagem auditiva neonatal. Rev baiana saúde pública [Internet]. 2011 [cited 2010 Dec 11];35(4):948-65. Available from: http://inseer.ibict.br/rbsp/index.php/rbsp/article/viewFile/265/pdf_78

7. Yoshinaga-Itano C. Levels of evidence: universal newborn hearing screening (UNHS) and early hearing detection and intervention systems (EHDI). J Multiling Commun Disord [Internet]. 2004 [cited 2010 Jan 11]; 37: 451-65. Available from: http://lsl.usu.edu/files/Yoshinaga-levelsofconfindence.pdf

8. Alvarenga KF, Bevilacqua MC, Melo TM, Lopes AC, Moret ALM. Participação das famílias em Programas de Saúde Auditiva: um estudo descritivo. Rev Soc Bras Fonoaudiol [Internet]. 2011 [cited 2011 Dec 10];16(1):49-53. Available from: http://www.scielo.br/pdf/rsbf/v16n1/10.pdf

9. Alvarenga KF, Gadret JM, Araújo ES, Bevilacqua MC. Triagem auditiva neonatal: motivos da evasão das famílias no processo de detecção precoce. Rev Soc Bras Fonoaudiol [Internet]. 2012 [cited 2012 Nov 10];17(3):241-7. Available from: http://www.scielo.br/pdf/rsbf/v17n3/02.pdf

10. Fernandes JC, Nozawa MR. Estudo da efetividade de um programa de triagem auditiva neonatal universal. Ciên saúde coletiva [Internet]. 2010 [cited 2011 Feb 12];15(2):353-61. Available from: http://www.scielo.br/pdf/csc/v15n2/v15n2a10.pdf

11. Gopal R, Hugo SR, Louw B. Identification and follow-up of children with hearing loss in Mauritius. Int J Pediatr Otorhinolaryngol [Internet]. 2001 [cited 2011 Jan 15];57(2):99-113. Available from: http://www.alldissertations.com/full.php?id=92676

12. Schoeller SD, Leopardi MT, Ramos FS. Cuidado: eixo da vida, desafio da enfermagem. Rev enferm UFSM [Internet]. 2011 [cited 2011 Jan 15];1(1):88-96. Available from:

http://cascavel.ufsm.br/revistas/ojs-2.2.2/index.php/reufsm/article/view/2013/1515

13. Rangel RF, Fugali MM, Backes DS, Gehlen MH, Souza MHT. Avanços e perspectivas da atuação do enfermeiro em estratégia saúde da família. Cogitare enferm [Internet]. 2011 [cited 2011 Jan 15];16(3):498-504. Available from: http://ojs.c3sl.ufpr.br/ojs2/index.php/cogitare/article/view/24223/16236

14. Pinto JP, Ribeiro CA, Pettengill MM, Balieiro MMFG. Cuidado centrado na família e sua aplicação na enfermagem pediátrica. Rev bras enferm [Internet]. 2010 [cited 2011 Jan 15];63(1):132-5. Available from: http://www.scielo.br/pdf/reben/v63n1/v63n1a22.pdf

15. Munhoz SRM. Um programa de triagem auditiva neonatal: efetividade e ações educativas [dissertation on the internet]. Piracicaba (SP): Universidade Metodista de Piracicaba, Programa de Pós-Graduação em Educação. 2007 [cited 2011 Jan 15]. Available from: https://www.unimep.br/phpg/bibdig/pdfs/2006/PSIRUTVHVGJL.pdf

16. Hilú MRPB, Zeigelboim BS. O conhecimento, a valorização da triagem auditiva neonatal e a intervenção precoce da perda auditiva. Rev CEFAC [Internet]. 2007 [cited 2010 Feb 11];9(4):563-70. Available from: http://www.scielo.br/pdf/rcefac/v9n4/15.pdf

17. Brasil. Lei 12.303, de 02 de agosto de 2010. Dispõe sobre a obrigatoriedade de realização do exame denominado Emissões Otoacústicas Evocadas. Brasília, [Internet]. 2010 [cited 2012 Aug 04]. Available from: http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12303.htm

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