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Challenges of Screening and Early Detection of Hearing Impairment among Children in some selected hospitals in Kumasi Metropolis

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Abstract: Hearing plays a key role in learning to talk. Early screening of newborns for hearing impairment is essential as treatment is most successful when identified early. The study assessed the challenges associated with screening and early detection of hearing impairment among children in the Kumasi metropolis and focused on the services available for screening of hearing impairment among children and the effects of the challenges of screening and early detection of hearing impairment. The study employed a qualitative approach. Purposive and convenience sampling were used to select 15 participants. An interview guide was adopted to capture the responses of participants on voice recorder. Thematic content analysis was used to analyse themes generated from the data according to the objectives. The study found that, hearing screening services for children included OAEs, pure tone testing, behavioral assessment and school outreach programs but health personnel are faced with challenges in undertaking these services. Challenges such as lack of enough funds, insufficient tools and equipment, few numbers of health personnel and low patronage of hearing screening services limited health personnel's ability to provide effective hearing screening services to children. The study therefore recommends that the ministry of health constructs audiology units in every region in Ghana and supply the units with the tools and equipment needed for work. The study further recommends that, the ministry of health in collaboration with ministry of education should assist in training more audiologists and make school screening programs a long term national policy.

Keywords: Hearing impairment, children, early detection, screening, Kumasi Metropolis, otoacoustic emissions (OAEs), pure tone testing, school screening.

INTRODUCTION

Quality health care is becoming increasing accessible in most developing countries. However, the various health facilities such as hospitals, clinics, and maternity homes face great difficulty in early detection of "abnormal" conditions in children to avert permanent disabilities in the future [1].

Hearing plays a key role in learning to talk. Without speech and hearing, it is difficult to develop and thrive interpersonal relationships [2]. Hearing loss can be present at birth. This is termed as congenital hearing loss. Late identification of the congenital hearing loss causes risk of substantial delay in acquisition of language and communication skills, coupled with long term risk to educational achievement, mental health and quality of life [3]. It is vital that "abnormalities" are detected early enough so that appropriate measures can be taken to prevent permanent disabilities [4]. Health facilities can perform this function best, only when their capacities are expanded

and are well equipped with the requisite resources such as skilled health personnel, screening equipment/tools, and funds [5].

The early years in infancy are very crucial, specifically to developing language and communication. Since, it is the time when the brain is at its highest capacity of development and undergoes some structural changes in response to external stimulation [1]. The first three years in infancy is the time when children are exposed to and learn language. A study conducted by the American Academy of Otolaryngology showed that children begin learning speech and language in the first six months of life.

Early screening of newborns for hearing impairment is therefore necessary, since treatment is most successful when identified early. With the appropriate early intervention, they can be mainstreamed in education [6]. A study by Ptok [2] indicated that 1-2 out of 1000 newborns have markedly

impaired hearing therefore the need for early detection and screening of newborn babies within one month of life. In Ghana, it was found that of a total 5,391 children screened, 21 % were positive for disability including hearing impairment [7]. Although the importance of early identification and screening has been recognized for over 60 years now, due to poverty, inadequate technology and scanty statistical research and misconception, hearing impairment is becoming but a challenge in Ghana. This study sought to assess the challenges associated with screening and early detection of hearing impairment among children in the Kumasi metropolis. Specifically, the study assessed services available for screening of hearing impairment among children, challenges involved in the screening of hearing impairment and the effects of the challenges of screening and early detection of hearing impairment.

METHODS

Research setting

The study was conducted in the Eye, Ear, Nose and Throat (EENT) directorate of Komfo Anokye Teaching Hospital (KATH) and Suntreso Government Hospital in Kumasi, Ghana. KATH is the only tertiary hospital in Ashanti Region. KATH currently has 1200 beds and several departments which includes; anesthesia and intensive care, child health, surgery, emergency medicine, eye, ear, nose and throat (EENT), oral health, oncology, trauma and orthopedic etc.

The Suntreso Government Hospital is a secondary hospital located at North Suntreso. The Suntreso Government Hospital has the following department; paediatric, eye, surgery and ear, nose and throat. Both facilities are referral hospitals. The study was conducted from January to May 2017.

Research design and approach

Descriptive research design and qualitative approach was employed to investigate the challenges associated with screening and early detection of hearing impairment among children. The above stated philosophical design and approach helped to explore and understand the challenges associated with screening and early detection of hearing impairment among children by inquiring about participants' experiences on the subject.

Population

The population for the study consisted of health personnel at the audiology departments in the above cited hospitals. These health care providers were selected because they carry out hearing screening at the hospitals. Therefore, they are better equipped with information regarding challenges with screening of hearing.

Sampling method and sample size

The sampling methods used was purposive and convenience sampling techniques. Purposive sampling was used to select a particular group of health care providers who screen for hearing impairment and provide hearing services. These included audiologists, audiologists' assistants, otolaryngologists and ear, nose and throat (ENT) nurses. Convenience sampling was used to select participants who are readily available during the period of study. This sampling technique was used on the Otolaryngologists and the ENT nurses.

The study used a sample size of 15 participants. The sample size included 10 participants from KATH and 5 participants from Suntreso Hospital. More participants were purposively selected from KATH because, it is a tertiary hospital. The participants from the cited hospitals comprised of 2 audiologists, 3 audiologists' assistants, 4 otolaryngologists and 6 ear, nose and throat nurses.

DATA COLLECTION INSTRUMENT

The researchers adopted an interview guide to investigate challenges associated with screening and early detection of hearing impairment among children. This allowed in-depth exploration of respondents' experiences on the subject.

Data collection procedure

Audio-recorder was used to capture the responses of the participants with the aid of an interview guide designed by the researchers. The respondents were interviewed individually during working hours at their department. To ensure validity of this study, the researchers examined and evaluated the interview guide to help yield the study objectives. The audio-recording of the interviews with the respondents helped to avoid bias from recalling the conversations off head. This ensured reliability of the study.

Data analysis method

The data was analyzed using thematic content analysis. The recorded data was transcribed into written notes. The researchers read through the notes several times to get familiar with the content. Codes were assigned to the responses. Themes were then generated from similar codes. The themes were supported with direct quotes from the participants.

Ethical consideration

The procedures, risks and benefits of participation in the study were made known to the respondents. Respondents signed an informed consent form. The researchers ensured anonymity and confidentiality by not demanding for participant's identity and protecting their responses from any third party who was not directly involved in the study. Ethical clearance was obtained from KATH and the Suntreso hospital.

FINDINGS

Demographic characteristics of respondents

15 respondents participated in the study; 10 females (66.7%) and 5 males (33.3%). They comprised 2 audiologists (13.3%), 4 otolaryngologists (26.7%), 3 audiologists' assistants (20.0%) and 6 ENT nurses (40.0%). All audiologists in Kumasi participated in the study.

Themes of interview

The study explored the following themes during the interview; services available for screening hearing impairment among children, challenges involved in the screening services and effects of the challenges on the screening services.

Services available for screening hearing impairment among children

According to the respondents, the services available for screening of children are otoacoustic emissions (OAEs), pure tone testing, behavioral assessment and school screening programs.

(Respondent B) stressed that OAEs is performed on newborn babies referred from the child health unit with the risk of hearing impairment.

(Respondent I) said the OAEs can be used to detect blockage in the outer ear canal and damage to the outer hair cells in the cochlea of a baby.

(Respondent A) emphasized that pure tone testing is used to test the child's middle ear and to detect the faintest sound heard.

(Respondent H) explained that pure tone testing is performed on children of age two and above who can follow instructions because, it requires the child to raise a finger or hand when a sound is heard.

(Respondent J) stated that behavioral assessment is performed on children from 1-3 years of age. It involves hand claps, shaking of keys, flipping of the finger. The child responds to these sounds by turning to the direction of the sound.

(Respondent C) stressed on school outreach programs to screen school going children starting from kindergarten once every week.

Challenges involved in the screening of hearing impairment among children

The study identified several challenges that hinders screening and early detection of hearing impairment among children. These were financial difficulties, inadequate number of personnel, poor patronage of screening services and lack of right types of tools and equipment.

Poor patronage

(Respondent A) stressed that most people do not access the hearing screening services because they cannot afford the bill.

(Respondent B) also explained that people are reluctant in accessing these hearing services because of lack of information on hearing issues.

(Respondent H) said people do not patronize the services because of distance barriers, as there are three audiology units in three out of the ten regions in Ghana.

Financial constraints

(Respondent E) said there are not enough funds to purchase tools and equipment for hearing screening. (Respondent L) mentioned that sometimes I have to self-fund the outreach programs.

Insufficient tools and equipment

(Respondent F) "I sometimes have to find alternative tools for the screening services because the ear clinic lacks the right tools and equipment."

(Respondent J) "The tools available for screening are insufficient so I mostly share when all the personnel are using the same type of tool."

(Respondent G) "When the tools and equipment get spoilt, it is difficult to repair because there are few biomedical engineers in the country, so we often buy a new one."

Inadequate number of health personnel

(Respondent H) "The personnel are few, so it increases the workload on the personnel." (Respondent G) "Because the personnel are few, sometimes all the children cannot be attended to during outreach programs."

Effects of challenges on screening and early identification of hearing impairment among children

(Respondent N) "I am ready to go on school outreach programs and also attend to patients, but some of these challenges I face limits the provision of quality services to my patients".

(Respondent G) "The population is increasing and the screening programs are decreasing because of the challenges so late identification of hearing impairment will still exist which will increase the prevalence rate".

(Respondent B) "If the condition is not detected early because of any of these challenges mentioned, the child might develop some complications and no interventions can be provided".

DISCUSSIONS

The proportion of females being higher than the males in this study was not intentional. It was not surprising that few audiologists participated in the study because; there are few hearing specialists in the country.

The study revealed that, services for screening hearing impairment among children includes OAEs for newborns, pure tone testing for children 2 years and above, behavioral assessment for children who can follow instructions and school outreach programs for school going children. These services if executed effectively would help to reduce the prevalence rate of hearing impairments among children in Ghana. This is because, irrespective of the child's age, hearing impairment can be detected early and intervened. The school outreach program which incorporates hearing screening, corroborate a study by the American Speech-Language-Hearing Association [8] who found that school hearing screening is an integral tool in identifying children with hearing loss, who were not identified at birth, lost to follow up, or who developed hearing loss later on during childhood.

All the respondents acknowledged to having faced challenges in hearing screening among children. The root cause of most of the challenges in the screening and early detection of hearing impairment among children is lack of enough funding. Lack of enough funds to procure needed tools and equipment and to sponsor school outreach programs limited the personnel at the ear clinics from providing quality screening services to children. A study by Low *et al.* [9] also revealed similar trend where lack of enough tools and equipment due to poverty had been a leading challenge in hearing screening services.

The study also established insufficient tools and equipment to be another challenge hindering the screening and early detection of hearing impairment at the study settings and on outreach programs. A study by Kamal [10] remarked that challenges facing hearing screening among newborns in developing countries were acquiring the resources to implement solutions for detection and treatment of hearing impairments. The insufficiency of tools and equipment at the study settings resulted in health personnel using alternatives for hearing screening among children which are less effective. Studies by American Audiology Association [11] emphasized that regardless of the type of equipment used for screening, it is critical it performs as intended in order to avoid passing some children who have a hearing loss.

A study by Offei [10] identified the ratio of audiologists to the entire population of Ghana is 1:3,100,000. This study also revealed similar pattern

where few health personnel carry out hearing screening and outreach programs at the study sites and in schools respectively. This increases the workload on the personnel at the ear clinics and concurrently reduces the number of patients they can attend to.

Most of the respondents mentioned that low patronage arising from monetary issues, parents' reluctances and distance barriers hindered early identification of hearing impairment among children at the study sites. This validate a study by Asma *et al.* [11] which established that, the possible cause for high rates in hearing impairment could be due to the parent's ignorance on the importance of continuous assessment and the parent's impression that their baby has good hearing.

All the respondents had knowledge on the importance of early identification and intervention of hearing impairment, but the challenges they encounter in hearing screening among children reduce their efficacy in early identification and intervention. The repercussion of these challenges can be detrimental resulting in late detection of hearing impairment coupled with late intervention with little or no benefit to the child. Children are faced with the risk of living unfulfilled life if some of these challenges render them hearing impaired.

CONCLUSION AND RECOMMENDATION

The study concluded that, hearing screening services for children included OAEs, pure tone testing, behavioral assessment and school outreach programs but health personnel are faced with challenges in undertaking these services. Challenges such as lack of enough funds, insufficient tools and equipment, few numbers of health personnel and low patronage of hearing screening services limited health personnel's ability to provide effective hearing screening services to children. The study therefore recommends that the ministry of health constructs audiology units in every region in Ghana and supply the units with the tools and equipment needed for work. The study further recommends that, the ministry of health in collaboration with ministry of education should assist in training more audiologists and make school screening programs a long term national policy. Furthermore, the antenatal care unit should educate mothers on screening of their babies after birth and hearing screening should be covered by the national health insurance scheme.

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