

Hearing-screening record-keeping practices at primary healthcare clinics in Gauteng

Karin Joubert,¹ PhD; Aisha Casoojee,² MA (Audiology)

¹ Department of Speech Pathology and Audiology, University of the Witwatersrand, Johannesburg, South Africa

² Private practice, Johannesburg, South Africa

Corresponding author: A Casoojee (aisha.casoojee@gmail.com)

Objectives. As little is known about hearing screening practices at primary healthcare (PHC) clinics in South Africa, the study aimed to describe hearing-screening and record-keeping practices of nurses during typical immunisation sessions at PHC clinics in Gauteng, South Africa.

Methods. Data were obtained through observations ($N_2=80$) and questionnaires ($N_1=20$) which were then cross-checked with retrospective information collected from the Road-to-Health Charts and City of Johannesburg Child Health Services Blue Cards of children observed during typical immunisation sessions.

Results. A key finding of this study was that PHC nurses who participated in this study do not adhere to the hearing-screening record-keeping practices as outlined by the national Department of Health.

Conclusions. Poor record-keeping practices hinder the efficacy of hearing-screening programmes. Accurate record keeping is important in order to document outcomes which can be used to evaluate service delivery and the efficacy of hearing-screening programmes.

Keywords: hearing screening, primary healthcare, record keeping, nurses

S Afr J CD 2013;60:27-30. DOI:10.7196/SAJCD.233



Early hearing detection and intervention (EHDI) generally constitute programmes aimed at identifying hearing impairment in infants as early as possible. The Health Professions Council of South Africa (HPCSA) proposed universal newborn hearing screening (UNHS) as part of EHDI in South Africa as an integrated part of primary, secondary and tertiary levels of healthcare (HPCSA, 2007). These guidelines proposed that screening be conducted as soon as possible after birth but before 3 months of age, diagnosis made by 4 months of age and intervention started before 8 months of age (HPCSA, 2007).

Despite these guidelines, it is evident that EHDI in South Africa has yet to achieve these targets. This is mainly due to the prevailing adverse health and socio-economic conditions and restricted resources (Swanepoel, Störbeck & Friedland, 2009; Venter & Viljoen, 2008; Van der Spuy & Pottas, 2008). Health priorities in South Africa are mainly focused on the HIV/AIDS pandemic as opposed to individuals with hearing loss (Swanepoel, Hugo & Louw, 2006).

The average age of diagnosis of hearing impairment in Gauteng, South Africa, is 31 months, the average age of initial hearing aid fitting is 39 months, and the average age is 43 months for enrolment into an early intervention programme (Venter & Viljoen, 2008). Similar findings were reported for a larger-scale study conducted in the Western Cape, where the mean age of initial hearing aid fitting was reported as 28 months, and 31 months for the enrolment into an early intervention programme (Van der Spuy & Pottas, 2008). It is therefore evident that screening alone cannot ensure that a child with a hearing impairment will be identified early.

It has been found that a co-ordinated flow of activities that involves efficient tracking, reporting, and follow-up of children identified with hearing impairment will facilitate early identification and intervention (NCHAM, 2012). The implementation of tracking systems that allow for effective follow-up and referral systems will, however, ensure that those infants at risk of a hearing impairment are provided with appropriate services within the critical period for language development (Swanepoel et al., 2009). An integrated information system to manage data within each district health system in South Africa is recommended by the HPCSA (2007). Although a secure and comprehensive centralised database is required, South African EHDI programmes currently utilise manual reports to drive programme evaluation efforts.

With almost 90% of South African children fully immunised by the age of 1 year, it is recommended that infant hearing screening should be performed at immunisation clinics within the current primary healthcare (PHC) structures (Day, Barron, Monticelli & Sello, 2010;

Swanepoel et al., 2006). Within the South African healthcare sector, PHC nurses, who see the child most often, have the opportunity of monitoring auditory development of these children.

The PHC Package (DoH, 2002) stipulates that hearing screening should be conducted by PHC nurses using two hearing screening methods, the Swart Questionnaire (Swart, 1996) and the Voice Test (Pirozzo, 2003). The Swart Questionnaire comprises a series of questions to be asked for two different age groups (3 months and 6 months) in order to obtain information on the development of sound awareness in infants (Swart, 1996). The Voice Test is conducted on children from 12 months onward and is viewed as a simple yet accurate test of hearing impairment (Pirozzo, 2003). With the Voice Test the child is required either to repeat what is said or follow a simple one-part instruction in response to the nurse talking from behind the baby at an arm's length away (DoH, 2005).

Guidelines stipulate that PHC nurses record the results of the hearing screening conducted during a typical immunisation session on the Road-to-Health Chart (RtHC) and the City of Johannesburg (CoJ) Child Health Services Blue Card. The RtHC is a record of a child's health and development which remains in the possession of parents/caregivers. This card should be presented to the PHC nurse or health worker at every visit to the PHC clinic or other healthcare facility (Swart, 1996). The rationale for recording the details of a child's progress on the RtHC is to encourage a partnership between the health professional and parents/caregivers, promote effective decision making and to establish continuity of care (Swart, 1996). The same information is essentially recorded on the CoJ Child Health Services Blue Card, but is retained by the clinic. Both records include four sections, namely developmental, family, obstetric and pregnancy history. It includes space for recording immunisations, nursing care plans, child development and growth plotting. The child development chart guides the nurses to assess age-appropriate milestones (including hearing and speech) (Thandrayen, 2008).

The RtHC and CoJ Child Health Services Blue Cards provide an opportunity to facilitate a national information system that meets the requirements for hearing-screening record keeping, as recommended in the HPCSA (2007) Position Statement. These cards serve as means of record keeping for PHC clinics until such time as a national electronic information infrastructure is developed for the management of EHDI programmes which could provide data for audit and future service development decisions. It is, however, important for these records to provide accurate information that could assist in predicting the incidence of hearing impairment (Traynor, 2011).

Methods

Objective

The aims of the study were to describe the hearing-screening and record-keeping practices of nurses during typical immunisation sessions at PHC clinics in Gauteng, South Africa.

Study design

A descriptive, survey research design was implemented for the purposes of the study. Data were obtained through observations and questionnaires which were then cross-checked with retrospective information collected from the RthCs and CoJ Child Health Services Blue Cards.

Participants

Probability, simple random sampling was used to select the 20 PHC clinics in the CoJ Metropolitan Council included in the study. The participants comprised two groups:

- **Participant group 1: nurses.** Twenty nurses ($N_1=20$) employed at the selected PHC clinics were included in the study. They were required to be registered as a professional nurse or an enrolled nursing auxiliary as these are the categories of nurses who conduct immunisations at PHC clinics. They were further required to perform immunisations within their work contexts. On average participants had been qualified for 13.8 years (range: 1 - 40 years; standard deviation (SD) 11.41). They had worked as PHC nurses for an average of 4.97 years (range: 0.6 - 24 years; SD 5.82).
- **Participant group 2: child patients.** This participant group included the children ($N_2=80$) who were attended to by the nurses in participant group 1. Four immunisation sessions were observed for each of the nurses. A retrospective review of the RthC and CoJ Child Health Services Blue Cards records was conducted for each child. The average age of the children was 20.06 months (range: 6 - 62 months; SD 16.14). Thirty-five per cent ($n_2=28$) of the children in the sample were in the age group 6 - 11 months old, 37.6% ($n_2=30$) were aged 12 - 23 months old and 27.5% ($n_2=22$) were between 24 months and 6 years of age.

Materials

Three data collection tools (available on request) were developed for the purpose of the study: (i) nurses' observation form; (ii) nurses' questionnaire; and (iii) the retrospective data compilation sheet.

The *nurses' observation form* was developed for use during the observation of immunisation sessions performed by the nurse participants. The form consisted of 40 items in eight categories and aimed to identify the implementation of and adherence to protocols in a typical immunisation session, as well as to obtain information on how patient-specific administrative procedures are documented.

The *nurses' questionnaire* was completed by the nurse participants. This structured questionnaire probed nurses' self-reported adherence to guidelines and protocols used when conducting immunisation and hearing screening. For the purpose of this article, only the information obtained from the tracking and record-keeping systems employed at clinics will be reported.

The *retrospective data compilation sheet* was developed to review the hearing-screening result and proposed management plan documented on the RthC and CoJ Child Health Services Blue Cards of participants in group 2.

Procedures

Ethical considerations

Procedures followed were in accordance with the World Medical Association's Declaration of Helsinki (2008). Ethical approval for the study was obtained from the University Research Ethics Committee. Written informed consent was obtained from the CoJ Department of Health (DoH), clinic managers and all participants, using approved methods. All participants in the study were fully informed about the nature of the study, and assured of confidentiality and their right to withdraw from the study at any time, without any negative consequences.

Data collection

Data collection took place at a time that was proposed as most convenient by the clinic managers. The nurses' observation form was

completed while observing four immunisation sessions per participant. The records (RthC and CoJ Child Health Services Blue Cards) of children attended to by the nurses during observation sessions were then reviewed and recorded on the retrospective data compilation sheet. The nurses then completed the nurses' questionnaire independently while the researcher conducted the record review. The completed questionnaires were collected by the researcher immediately after completion. Lastly, a focus group was held with nurses to obtain more information on reasons for current record-keeping practices.

Reliability and validity

- **Reliability:** Twenty-five per cent of the records were reviewed by an interrater with 4 years' clinical experience in the field of audiology. The interrater agreement was 99.3%.
- **Validity:** Face and content validity of the data collection tools was established by conducting two pilot studies. The use of the simple random sampling strategy to select a representative sample for inclusion in the study enhanced the external validity of the study.

Data analysis

Data were documented on all relevant measuring instruments and encoded according to data definitions. The data were tabulated and analysed using the South African Statistics (SAS) Software, Version 9.1.3 for Windows (SAS Institute Inc, 2002 - 2003). Descriptive statistical measures (averages, means and standard deviations) were used to analyse the data.

Results

Retrospective record review

A retrospective review was conducted of immunisation information recorded by the PHC nurses on the RthC and CoJ Child Health Services Blue Cards of the participants in group 2 ($N_2=80$). The information reviewed included pre- and perinatal histories, birth weight, birth length, head circumference, Apgar scores and hearing-screening results. It is evident from the results presented in Table 1 that in the majority of cases PHC nurses did not record information obtained during typical immunisation sessions on the documents prescribed in the government policies and guidelines. This is especially true for the hearing-screening tests conducted by nurses.

For those children for whom the Swart Questionnaire was applicable at 3 months of age, it was found that results were recorded on 25% ($n_2=20$) of the RthC reviewed. In contrast, results were recorded on 65% ($n_2=52$) of the CoJ Health Services Blue Cards. In only 3 cases were the 3-month hearing-screening results recorded on both cards. Thirty-four per cent ($n_2=7$) of the children had no hearing-screening results recorded on either card.

It was found that for the 6-month hearing screening (using the Swart Questionnaire), results were recorded on 9% ($n_2=7$) of the RthC, and 69% ($n_2=55$) of the CoJ Health Services Blue Cards. In 7.5% ($n_2=11$) of the records reviewed, results were recorded on both cards. In 29% ($n_2=23$) of the cases, neither card was found to contain information regarding sound localisation at 6 months of age.

The Voice Test, conducted at 12 months of age, was applicable in only 69% ($n_2=55$) of the records reviewed. The Voice Test results were recorded on 11% ($n=6$) of the RthC and 65% ($n=36$) of the CoJ Health Services Blue Cards. The Voice Test results were not recorded on either of the cards in 41% ($n=23$) of the records reviewed.

Overall, of the records reviewed, 11% ($n_2=9$) of RthC and 66% ($n_2=54$) of the CoJ Health Services Blue Cards contained information on hearing-screening results, while in 4% ($n_2=3$) of the cases the hearing-screening results were recorded on both cards.

Conducting and recording hearing-screening results

Hearing-screening practices

Sixty-five per cent ($n_1=13$) of participants indicated that they conducted the Swart Questionnaire and 75% ($n_1=15$) indicated that they performed the Voice Test on all children. One participant (5%) indicated she does not do the Voice Test but conducts the Swart Questionnaire on all children. A variety of alternative hearing tests was indicated by the participants, including using noisemakers, knocking a

teaspoon against a cup, finger snapping, talking to the child, and hand clapping or squashing paper near the child's ear.

The immunisation sessions were observed by the second author to determine whether the DoH-stipulated hearing-screening procedures (Swart Questionnaire and Voice Test) were conducted, as well as whether the observed procedures were age-appropriate and procedurally correct. Of the nurse participants observed during the study, 5% ($n_1=1$) assessed all the children correctly in terms of both test procedures and age-appropriateness. Twenty-five per cent ($n_1=5$) of the participants conducted both the screening tests at an appropriate age but followed the incorrect procedure. Twenty-five per cent ($n_1=5$) of the participants conducted the test procedure appropriately but at an incorrect age. Forty-five per cent ($n_1=9$) of the participants did not conduct the Voice Test for children older than 12 months of age. Of the immunisation sessions observed, DoH-stipulated hearing-screening procedures were conducted in 51% ($n_2=41$) of cases. The results are presented in Table 2.

Recording of hearing-screening results

All nurse participants ($n_1=20$) reported that they recorded hearing-screening results on the clinic-retained CoJ Child Health Services Blue Card while 80% ($n_1=16$) reported that they recorded the results on the patient-retained RtHC. Forty-one hearing-screening tests were conducted during the immunisation sessions observed and contrary to nurses' reports, in 73% ($n=30$) of all cases screening results were not recorded on either of the cards.

Focus group results

Although the focus group participants reported that the RtHC and the CoJ Child Health Services Blue Card are equally important, they felt that the information to be recorded on each differs. In their view, immunisations are recorded on the RtHC while the results of the physical examination conducted on the children are recorded on the CoJ Child Health Services Blue Card. They further reported that because of staff constraints and the high patient load, they tend to record only the results that they deem most pertinent following a consultation.

Discussion

The retrospective record review confirms the feedback from the focus group participants that hearing-screening results were not deemed pertinent information. Results of the physical examination (e.g. birth weight, length and head circumference) were thus most often recorded on both the clinic- and patient-retained records. This was followed by pre- and perinatal history and the Apgar scores.

A key finding of this study is that PHC nurses who participated in this study do not adhere to the hearing-screening and record-keeping practices as outlined by the DoH (2002). It is postulated that the introduction of the prevention of mother-to-child transmission (PMTCT) guidelines, necessitated by the HIV/AIDS pandemic in South Africa, requires nurses, in addition to the current requirements, to obtain and record a comprehensive HIV/AIDS-related case history. This, combined with high patient loads, as specifically mentioned

during the focus group discussion, further limits the time available for nurses to conduct appropriate hearing-screening procedures.

It is hypothesised that the current system of keeping duplicate patient records (e.g. clinic- and patient-retained cards) at PHC level increases the workload of nurses in immunisation clinics, forcing them to limit their administrative responsibilities. The findings of the current study confirm this, and concur with the results of previous studies that found that hearing-screening results are more often recorded on the clinic-retained records than the patient-retained RtHC (Petrocchi-Bartal, 2011; Thandrayen, 2008).

Poor record-keeping practices may make it difficult to track patients who may have defaulted from clinics, or hamper the continuity of care for those patients who do return. Poor record-keeping practices hinder effective service delivery as they prevent early diagnosis and subsequent intervention for hearing impairment (Kanjji, 2010; Olusanya, 2007). Accurate record-keeping practices provide a means of recording outcomes measures of the efficacy of hearing-screening programmes (Johnson & Danhauer, 2002). Results of the current study elucidate the fact that there is no consistency across clinics despite the presence of the existing framework within the RtHC and CoJ Child Health Services Blue Cards that allow for record keeping of developmental milestones, including hearing.

Conclusion

The information yielded by this study contributes to the expansion of evidence-based data on the current hearing-screening practices at PHC clinics in South Africa. The context-specific barriers to the implementation of EHDI as it relates to record-keeping practices have been highlighted. Optimising the implementation of current governmental hearing-screening protocols, nurses' awareness and understanding of the importance of hearing screening will pave the way for more structured EHDI programmes in years to come. The adherence to the existing protocols by PHC nurses henceforth will provide relevant statistical data on the prevalence of possible hearing impairments, which would eventually justify the implementation of widespread universal hearing-screening programmes in South Africa.

The results of this study should be cautiously interpreted in the light of its exploratory nature, small sample size and context limitations. Future research should address the replication of this study with a larger sample size in a variety of provincial and municipal clinics in South Africa. The administrative responsibility of PHC nurses as a contributory factor to the quality control of hearing-screening programmes needs to be addressed. The recognition of the importance of accurate recording and collection of data from the various stakeholders is critical for the success and future of EHDI programmes in South Africa.

References

- Day, C., Barron, P., Monticelli, F. & Sello, E. (Eds). (2010). Department of Health District Health Information System database 2009. District Health Barometer 2008/09. Durban: Health Systems Trust.
- Department of Health. (2002). The primary health care package for South Africa – a set of norms and standards. Pretoria: Department of Health.
- Department of Health. (2005). Guidelines for the prevention of hearing impairment due to otitis media. Retrieved 21 August 2010 from: <http://www.doh.gov.za/factsheets/guidelines/hearing.pdf>.

Table 1. Retrospective record review of information on the RtHC and CoJ Child Health Services Blue Cards

	N	RtHC (%)		CoJ Blue Card (%)	
		Yes	No	Yes	No
Pre- and perinatal history	80	59 (74)	21 (26)	78 (97.5)	2 (2.5)
Birth weight, birth length and head circumference	80	80 (100)	0	76 (95)	4 (5)
Apgar scores	80	74 (92.5)	6 (7.5)	74 (92.5)	6 (7.5)
Swart Questionnaire					
3 months	80	20 (25)	60 (75)	52 (65)	28 (35)
6 months	80	7 (9)	73 (91)	55 (69)	25 (31)
Voice Test (12 months)	55	6 (11)	49 (89)	36 (65)	19 (35)

Table 2. Data comparison of hearing tests ($N_2=80$)

	Swart Questionnaire	Voice Test
Age-appropriate	0	15
Procedure-appropriate	10	0
Age- and procedure-appropriate	16	23
Previously conducted and recorded	30	9
Not conducted because of inappropriate age of child	11	20
Should have been conducted	13	13
Total	80	80

- Health Professions Council of South Africa (HPCSA). (2007). Professional Board for Speech, Language and Hearing Profession: Early Hearing Detection and Intervention Programmes in South Africa, Position Statement Year 2007, 1-42. Retrieved from: http://www.hpcsa.co.za/downloads/speech_education/early_hearing_detection_statement.pdf
- Johnson, C. E. & Danhauer, J. L. (2002). Handbook of outcomes measurement in audiology. Canada: Singular Publishing.
- Kanji, A. (2010). Audiological function in a group of very low birth weight neonates in a tertiary hospital in Johannesburg, Gauteng. (Masters dissertation). 2010. Retrieved from <http://www.wiredspace.wits.ac.za/bitstream/handle/10539/8464/Kanji>
- National Center for Hearing Assessment and Management (NCHAM). (2012). The NCHAM e-Book: A resource guide for early hearing detection and intervention. Utah State University. <http://www.infanthearing.org/ehdi-ebook/index.html>
- Olusanya, B. O. (2007). Addressing the global neglect of childhood hearing impairment in developing countries. PLoS Med 4(4): e74. doi:10.1371/journal.pmed.0040074
- Petrocchi-Bartal, L. (2011). Clinic based hearing screening protocols: The feasibility of implementing the Health Professions Council of South Africa Year 2007 guidelines. (Masters dissertation). Retrieved from <http://wiredspace.wits.ac.za/bitstream/handle/10539/10134/Petrocchi-Bartal>
- Pirozzo, S. (2003). Whispered voice test for screening for hearing impairment in adults and children: A systematic review. BMJ 327(7421), 967. doi:10.1136/bmj.327.7421.967
- SAS Institute Inc. (2002 - 2003). SAS Software, version 9.1.3 for Windows. Cary, NC: SAS Institute Inc.
- Swanepoel, D., Hugo, R. & Louw, B. (2006). Infant hearing screening at immunization clinics in South Africa. Int J Pediatr Otorhinolaryngol 70(7), 1241-1249. doi:org/10.1016/j.ijporl.2006.01.002
- Swanepoel, D., Storbeck, C. & Friedland, P. (2009). Early hearing detection and intervention in South Africa. Int J Pediatr Otorhinolaryngol 73(6), 783-786. doi:org/10.1016/j.ijporl.2009.01.007
- Swart, J. G. (1996). Hearing assessment in general practice – cradle to grave. CME 14(5), 649-665.
- Thandrayen, K. (2008). The quality of child health services offered at primary health care clinics in Johannesburg. Unpublished research report: University of the Witwatersrand.
- Traynor, M. (2011). Bibliometrics as politics: The case of emerging disciplines. Int Nurs Rev 58(1), 26-27. doi:org/10.1111/j.1466-7657.2010.00874.x
- Trochim, W. M. K. (2006). Research methods knowledge base. (2nd Ed.). Retrieved from: <http://www.socialresearchmethods.net/kb/>
- Van der Spuy, T. & Pottas, L. (2008). Infant hearing loss in South Africa: Age of intervention and parental needs for support. International Journal of Audiology, 47(suppl 1), S30-S35. doi.org/10.1080/14992020802286210
- Venter, C. & Viljoen, J. (2008). Children with hearing loss: Parental needs regarding diagnosis. 2008. Unpublished B. Communication Pathology research report. University of Pretoria.
- World Medical Association Declaration of Helsinki (2008). Ethical principles for medical research involving human subjects. Retrieved from: [http://www.wma.net/en/30publications/10policies/b3/index.html.pdf?print-media-type&footer-right=\[page\]/\[toPage\]](http://www.wma.net/en/30publications/10policies/b3/index.html.pdf?print-media-type&footer-right=[page]/[toPage])