

A preliminary report of the pattern of ear disease among students attending a school for people with disabilities in Samoa

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Abstract

Objectives: The Ear, Nose, and Throat Department of Samoa is developing a school outreach service, and the aim of this study is to determine the pattern of ear disease among students attending a school for people with disabilities in Samoa.

Methods: The study design is a prospective study of a 2-day outreach visit to a school for people with disabilities by the Samoan Ear, Nose, and Throat team who recorded their clinical findings (N=28). Two Ear, Nose, and Throat Specialists performed ear examinations for each student and recorded their diagnosis and recommendations as per routine Ear, Nose, and Throat Clinic protocols on a purposefully designed form based on the World Health Organization Ear and Hearing Survey. This information was entered into an Excel spreadsheet for descriptive statistical analysis.

Results: Results showed that 39% (n=11) of students passed their initial ear examination, while 61% (n=17) of students presented with at least one ear condition requiring Ear, Nose, and Throat intervention. The most common pathology was impacted wax (n=15 ears). Following the Ear, Nose, and Throat Clinic outreach visit, 21 students (75%) no longer required Ear, Nose, and Throat or medical services, five students (18%) required a medical prescription for the treatment of ear disease, and two students (7%) were referred to the Ear, Nose, and Throat Department for further review.

Conclusion: Students attending schools for people with disabilities are a priority population for the Ear, Nose, and Throat Clinical service outreach programme.

Keywords

Impacted wax, people with disabilities, Pacific Islands, otitis media, schoolchildren, survey

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Introduction

The United Nations' Sustainable Development Goal Agenda (2015–2030) highlights social inclusion as a guiding principle for international health development.¹ People with disabilities (PWDs) are identified as a vulnerable population requiring special attention, in particular as nations work towards universal health coverage (Goal 3), access to quality education (Goal 4), and reduced inequalities and inequities (Goal 10). The United Nations reinforced its commitment to the social inclusion of PWDs during their COVID-19 Response Document of April 2020.

The Sustainable Development Goal Agenda offers a platform for the development of ear and hearing health services for students attending schools for PWDs. A review of the audiology literature from low- and middle-income countries (LMICs) found a number of studies investigating the cause

of permanent hearing loss among students attending schools for PWDs.^{2–5} These early papers were the foundation of current public health initiatives aimed at reducing preventable sensorineural hearing loss in LMICs (e.g. routine childhood immunizations). The literature also revealed that ear disease and additional conductive hearing loss was high among these

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students and that it may go undetected or be masked by the disability(ies) of the student.^{6–11}

There is only one paper from the Pacific Island region which investigates hearing loss among students attending schools for PWDs. Published in 1994, McPherson and colleagues reported hearing levels among students attending the two schools for PWDs in Samoa.¹² There were 20 students assessed at the first school which included a unit for hearing-impaired students: hearing levels were normal (30%), mild (10%), moderately severe (5%), severe (10%), and profound (45%). There were 18 students assessed at the second school which focused on students with intellectual impairment: hearing levels were normal (70%), mild (11.8%), moderate (5.9%), severe (5.9%), and profound (5.9%). Although ear examinations were performed for these students, they were not reported in the paper.

The Pacific Islands are estimated to have among the highest rates of otitis media in the world,^{13,14} and recent studies from the Solomon Islands suggest that ear disease continues to be a significant public health issue among infants and school-aged children.^{15,16} It is likely that ear disease is higher among students attending schools for PWDs than among their counter-parts attending mainstream schools. Although Ear, Nose, and Throat (ENT) and audiology services are limited throughout the Pacific Islands,^{17,18} the Sustainable Development Goal Agenda offers a mandate and a platform for including students attending schools for PWDs in all public health and community-based ear and hearing health service initiatives.^{19,20} The World Health Organization (WHO) recommends school-based hearing screening, including otoscopic examination, to facilitate the identification and management of both ear disease and hearing loss, and students attending schools for PWDs should be a priority for these programmes.²¹

The ENT Clinic of the Tupua Tamamsese Meaole Hospital in Samoa is currently undertaking a project to develop ENT and Audiology community outreach services. The policy of the ENT Clinic is to include PWDs in all healthcare service delivery. Following promotional activities on World Hearing Day 3 March 2020, the ENT Clinic was approached by one of the two schools for PWDs in Samoa to perform ear health checks for their students. This provided an excellent opportunity to pilot a service for this special population of at-risk students. The visit was scheduled for late March 2020, but was delayed until June 2020 due to the State of Emergency in Samoa and COVID-19 preparedness efforts. Samoa managed to remain COVID-19 free during the first year of the pandemic, and we were able to perform this outreach service once the state of emergency was lifted.

The aim of this article is to perform a review of the June 2020 ENT Clinic outreach visit to a school for PWDs in Samoa. The results will provide information on the pattern of ear disease among this population of students and should consolidate the case for prioritisation of students attending schools for PWDs in the routine ENT Clinic outreach service

budget. The results may be translational to other Pacific Island countries and provide the incentive for routine ear health checks for students attending schools for PWDs in other Pacific nations.

Materials and methods

This study was approved by the Government of Samoa Ministry of Health Ethical Research Committee and the University of Queensland Medical Ethics Research Committee (Approval No. 2020000255). Gatekeeper approval was also obtained from the participating school for PWDs.

Only students with a signed consent form from their parents/guardians/caregivers were eligible for an ear examination and any interventions required. The consent form included a statement that de-identified summarised results from the ENT Clinic service may be used at a future time for reporting and publication in a research journal.

Clinical records

The study design is a prospective study of a 2-day outreach visit to a school of PWDs by the Samoan ENT team who recorded their clinical findings. De-identified clinical records were obtained from the 2-day outreach visit performed by the ENT Clinic team in June 2020. All clinical records from this outreach visit were eligible for inclusion in the present review, and there were no exclusion criteria.

A clinical record sheet had been specifically prepared for the outreach visit based on Section D (Ear Examination) of the newly published WHO Ear and Hearing Survey Handbook²² (Online Appendix A). On the day of the ENT Clinical outreach service, the audiologist (A.K.) registered each student (name, age, and gender) and ensured the parent/guardian consent form was signed. The ENT Specialists (S.P. and A.L.) performed the otoscopic examination and completed the clinical record sheet for the right and left ears of each student according to the diagnostic criteria of the WHO Ear and Hearing Survey protocol (Online Appendix B). Any procedures (i.e. wax removal) were performed by the ENT nurses (F.F. and M.F.). The ENT Specialists performed a second review of students following any ENT nurse interventions, and this was recorded as the second diagnosis.

Data entry

The audiologist entered the results for each student into an MS Excel spreadsheet designed for the purpose of this review: student age (years), student gender (male/female), right/left ear diagnosis (no abnormalities detected (NAD), wax, chronic suppurative otitis media (CSOM), otitis media with effusion (OME), acute otitis externa (AOE), acute suppurative otitis media (ASOM), foreign body, dry tympanic membrane perforation, and Other, nurse intervention (wax

Table 1. Age and gender distribution of student participants.

	Group 1 (10 years and younger)	Group 2 (11 years and older)	Total
Female	3	6	9
Male	9	10	19
Total	12	16	28

removed, foreign body removed, and otorrhoea removed), and action required (no action, medical prescription, and review at ENT Clinic).

Statistical analysis

Descriptive statistical analysis was performed in collaboration with the Hearing Research Unit for Children at the University of Queensland (Brisbane, Australia). Student demographic information was reviewed using descriptive statistics (i.e. mean, standard deviation, median, and range). For each ear, the ear examination diagnoses, nurse interventions, and action required were tallied.

Results

Clinical records were available for all 28 students seen by the ENT Clinic during their 2-day outreach to the school for PWDs in June 2020. The school enrolment was 35 students, and 7 students were absent on the days of the ENT Clinic visit. The demographic data for the students seen is summarised in Table 1. There were 9 females, and 19 males. The age range was 5–29 years (mean=12.4 years, median=13 years, SD=4.9 years). Excluding the 29-year-old student, the age range was 5–19 years (mean=11.74 years, median=13 years, SD=3.75 years). There were 12 students in the younger age group (10 years and below), and 16 students in the older age group (11 years and older).

Overall, 61% (N=17) of students presented with an ear condition in at least one ear that required ENT intervention: 36% (N=10) of students had unilateral ear pathology, and 25% (N=7) of students had bilateral ear pathology.

The most common pathology was impacted wax requiring removal: 8/28 (29%) of right ears and 7/28 (25%) of left ears (Table 2). Following successful wax removal for seven right ears and seven left ears, otoscopic re-examination found no further abnormalities in six right ears and six left ears. One student was re-assessed with bilateral OME following bilateral cerumen removal. Cerumen removal could not be performed for one right ear, and the student was advised to apply coconut oil in the ear canal to soften wax, prior to review at the ENT Clinic for removal. The ENT Specialists wrote no prescriptions for right ears, but five left ears required a medical prescription: three prescriptions for Ciprofloxacin (CSOM n=2; AOE n=1) and two prescriptions for amoxicillin (AOM n=2). Overall, following the

Table 2. Summary of initial ear examination diagnoses results.

Initial diagnosis	Right ear	Left ear
NAD	19	15
Wax	8	7
CSOM	0	2
OME	0	0
AOE	0	1
ASOM	0	0
Foreign body	0	1
Dry TM perforation	0	1
Other	1	1
TOTAL	28	28

NAD: no abnormalities detected; CSOM: chronic suppurative otitis media; OME: otitis media with effusion; AOE: acute otitis externa; ASOM: acute suppurative otitis media; TM: tympanic membrane.

2-day outreach visit, 21 (75%) students required no further action, 5 (18%) required a medical prescription, and 2 (7%) were referred to the ENT Clinic for review.

A summary of the outreach visit is provided (Figure 1).

Discussion

This preliminary report found that an ENT Outreach service to the school for PWDs was very beneficial. Initially, only 39% (n=11) of students passed their ear examination for both ears. Following the ENT Clinic school visit, 75% (n=21) of students were assessed as having normal ear examination results for both ears. The most common cause of ear disorder was impacted wax, which was successfully removed in almost all cases. Studies from other LMICs similarly report significant outer and middle ear disorders among students attending Schools for the Deaf, including high impacted wax rates of 26%–40%.^{6–8}

The ENT Clinic visit to the school for PWDs demonstrated the benefits of outreach services for this special population of students. Access to hospital-based services may be difficult in Samoa, and the school-based visit provided essential information to school carers and educators about the ear health of their students. Attending hospital-based appointments is also confronting for some of the students. Performing the ear examinations in a familiar and safe environment, with the assistance of beloved and trusted carers/teachers, enabled the ENT Clinic team to successfully evaluate all students.

The Samoan ENT Clinic is currently preparing a large-scale school ear and hearing programme as part of the development of their outreach service. They will be using the newly launched WHO Ear and Hearing Survey to enable submission of results to the WHO Global Hearing Database. The outreach to the school for PWDs enabled the team to become familiar with the ear examination section of the survey. For our context, the ENT Specialists recommended that

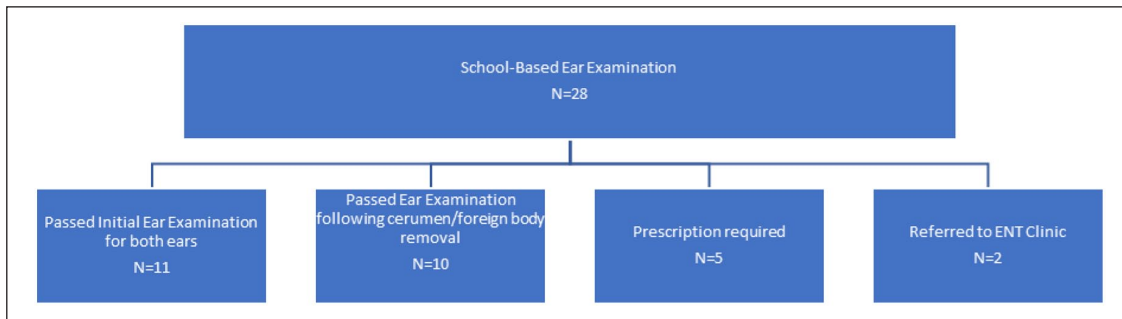


Figure 1. Summary of ENT Clinic outreach visit to school for PWDs.

‘otorrhoea treated’ and ‘effusion’ should be further included as additional options.

Our findings also reveal the advantage of including a team member(s) on outreach visits who is skilled at wax and foreign body removal. The provision of on-site aural toilet and other minor ENT procedures significantly reduced the number of students referred for follow-up at the hospital. A similar result was also reported in ENT outreach to mainstream schools in the Solomon Islands, another Pacific Island country.¹⁵

Our future visits to schools for PWDs may include hearing assessments. As previously mentioned, the school setting was amenable to ear examinations, and the option of auditory testing should be considered. Formal hearing test results may influence care of the student and would, therefore, be beneficial to this group of students for whom other disabilities may mask hearing status. Given the recent measles epidemic in Samoa, findings may highlight the importance of health promotion activities and public health initiatives to reduce preventable hearing loss.^{23,24} The ENT Clinic outreach programme to mainstream schools will include hearing screening if ambient noise levels meet the WHO Survey criteria of 40 dBA or softer. This should be possible if current plans to equip the ENT Clinic with a mobile sound-treated hearing booth are realised.

Future outreach visits to the school for PWDs may include collaboration with other departments, such as ophthalmology. Our visiting ENT Specialist from China (A.L.) is a rhinologist who recommends screening for hypertrophic adenoids: this may be achieved in this special group of students through a general health screen questionnaire to parents at the start of the year which includes the question ‘Does your child snore?’.

Limitations

This was only a small sample of students; however, it enabled us to highlight the importance of inclusion of these students in our outreach service. It also enabled our clinic to trial our protocols for our future large-scale school visit programme to mainstream schools.

A power analysis for sample size calculation was not performed, given the small eligible sample population size. All students enrolled in the school were eligible for the ENT clinical service, and therefore the medical records of all students who underwent an ENT examination were included in the review of clinical records.

Conclusion

High levels of impacted cerumen were documented in this population. Every effort should be made to ensure students attending schools for PWDs are prioritised in the ENT Clinic outreach service.

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Declaration of conflicting interests

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Ethics approval

This study was approved by the Government of Samoa Ministry of Health Ethical Research Committee and the University of Queensland Medical Ethics Research Committee (Approval No. 2020000255). Gatekeeper approval was obtained from the Ministry of Education, Sports, and Culture.

Informed consent

“Written informed consent was obtained from legally authorized representatives before the study”.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author, [AK]. The data are not publicly available due to restrictions (e.g. their containing information that could compromise the privacy of research participants).

Supplemental material

Supplemental material for this article is available online.

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