Aural Rehabilitation and Graduate Audiology Programs

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Abstract

The quantity and quality of aural rehabilitation training that audiology graduate students receive versus the current services available to those students regarding work with the hearing impaired, cochlear implant recipients, patients with vestibular disorders, patients with central auditory processing disorders, and patients suffering from tinnitus were examined. Forty ASHA-accredited colleges and universities were contacted by telephone and audiology faculty members were surveyed. The results of the survey may provide valuable information for identifying and addressing shortfalls in aural rehabilitation programs.

Key Words: Aural rehabilitation, central auditory processing disorders, cochlear implants, hearing aids, tinnitus

Abbreviations: ALD = assistive listening device, BTE = behind the ear, CAPD = central auditory processing disorder, CIC = completely in the canal, ENG = electronystagmography, ESB = Educational Standards Board

Obtaining and mastering skills in aural rehabilitation is essential to practicing audiologists. Consequently, audiology graduate students must receive adequate training in this area. The Educational Standards Board (ESB) of ASHA is responsible for the accreditation of undergraduate and graduate programs in audiology and speech-language pathology. The ESB is recognized by both the Commission on Recognition of Postsecondary Accreditation and the U.S. Department of Education. Accreditation by the ESB provides students with the assurance that the academic and clinical practicum experiences obtained in their educational program meet the nationally established standards (ASHA, 1995) so that upon graduation they will be able to meet the requirements necessary to obtain the Certification of Clinical Competency.

Currently, audiology graduate students in ASHA-accredited master’s degree programs are expected to receive at least 6 semester hours of course work in habilitative/rehabilitative procedures, including selection and use of appropriate amplification instruments, individual and group evaluation of instruments, evaluation of speech and language problems of the hearing impaired, and management procedures for speech and language habilitation and/or rehabilitation of the hearing impaired such as speechreading, auditory training, and manual communication (ASHA, 1995). These students also must have at least 20 clock hours of clinical experience in the treatment of hearing disorders in children and adults. According to ASHA, treatment of hearing disorders includes clinical management, counseling, auditory training, speechreading, and speech and language services for those clients with hearing impairment (ASHA, 1995).

There is, however, no provision for the training of graduate-level audiology students in the clinical management of clients with tinnitus, vestibular disorders, or central auditory processing disorders (CAPDs). Therefore, it is possible that many students will graduate from their audiology programs lacking knowledge of treatment and/or management plans for clients having these various disorders.

Since the 1980s, when quality assurance in health care and patient satisfaction became critical issues in the health care industry, decision making in rehabilitative audiology reached new levels of importance (McCarthy et al, 1990).
Traditionally, decision making in rehabilitative audiology has consisted of questionable assessment procedures and unproven treatment methods (McCarthy et al, 1990). Today, however, client input provides essential feedback to audiologists who are under pressure from managed health care organizations and the U.S. Food and Drug Administration (FDA) to provide high-quality services as well as products (Zarrella, 1995).

Many patients are now requesting that practicing audiologists provide them with more comprehensive rehabilitation services in their clinical practice. These services are extremely important and can significantly affect the patient's quality of life. It is the purpose of this study to identify potential strengths and weaknesses in the training of aural rehabilitation skills to graduate students in ASHA-accredited graduate programs in audiology.

**METHOD**

According to information received by the ESB of ASHA, there are currently 120 ASHA-accredited audiology graduate programs in the continental U.S. Of this total, 40 programs were randomly selected for study. The continental U.S. was separated into quadrants geographically—northeast, southeast, northwest, southwest—and the audiology programs were assigned to their appropriate geographical quadrants. Ten public or private universities/collages were randomly selected from each quadrant. One faculty member/clinic supervisor in the field of audiology from each program was contacted by telephone. The national office of ASHA provided a list of accredited graduate programs in audiology.

The format used in this study was a telephone survey. It consisted of 43 closed-ended questions and three open-ended questions (Appendix). The professors answering this survey received information regarding the purpose of the questions and the intent for the outcomes prior to responding to the questions. All faculty members who were contacted agreed to participate in the survey and each was asked questions in the same order.

Results of the survey were entered into a computer-based program through which quantitative statistical analysis of the data was accomplished.

**RESULTS**

The majority, 90 percent of the 40 programs selected for the study, were public universities with the remaining 10 percent being private colleges. Half of the schools were moderate in size, enrolling approximately 6000 to 15,000 undergraduate and graduate students. Forty-three percent of the schools were large universities, enrolling more than 15,000 students, and 7 percent were small colleges having less than 5000 students. The average number of audiology students trained each year in the 40 programs ranged from the categories of "from 1 to 5" to "more than 15," and the number of audiology faculty and staff at each program was at least two or more. The overall importance that the respondents felt that their program placed on teaching aural rehabilitation skills to their students varied greatly, ranging from "great importance" (60%), "some" (33%), to "very little" (7%).

One area of interest concerned the determination of the percentage of programs aligned with medical schools and university hospitals. Campus hospitals often provide students with exposure to ENT, surgical, and intensive care unit settings. Only 25 percent of the programs surveyed were affiliated with a medical school. Of these schools, 77 percent provide their audiology students with a clinical rotation in the campus medical setting.

All of the programs surveyed operate an audiology clinic on campus from which 75 percent of the programs dispense hearing aids. Of all of the programs dispensing hearing aids, 78 percent dispense behind-the-ear (BTEs) and in-the-ear (ITEs), 68 percent dispense completely-in-the-canal (CICs), and 70 percent dispense programmables. Only 28 percent of the programs surveyed participate in a cochlear implant program. Vestibular system disorders were evaluated by half of the campus audiology facilities in the programs surveyed. The majority of programs surveyed (88%) perform evaluations for CAPDs (Fig. 1).

The faculty surveyed report that of the clinical services provided on campus, those services that are strictly diagnostic comprise anywhere from 25 percent to 95 percent of the cases seen. Those services offered in the clinics that are strictly rehabilitary ranged from 0 percent to 75 percent.

Eighty-eight percent of the programs surveyed dispense assistive listening devices (ALDs) to their clients. In all of the programs surveyed, audiology graduate students participate in hearing aid orientation and counseling. Eighty-eight percent of the programs offered speechreading training, 75 percent offered training on listening skills, and 80 percent offered training of
Diagnostic Evaluations

Figure 1 The percentage of programs surveyed that offer these various diagnostic evaluations at their campus clinics: dispensing hearing aids, cochlear implants, ENG, computerized dynamic posturography, rotary chair, and central auditory processing evaluations.

ALD use in aural rehabilitation therapy offered to clients either individually or in group therapy sessions at their campus clinic.

In the few programs working with cochlear implants, only 23 percent of the graduate audiology students participate in preoperative cochlear implant work-ups. Also, only 25 percent of the students participate in the postoperative counseling and rehabilitation of the patients.

Ninety percent of the programs surveyed report providing information on causes and management strategies for tinnitus to their patients. The most common form of information provided to patients with complaints of tinnitus was pamphlets and literature about the condition. Sixty-three percent of the programs offer information on support groups to patients having tinnitus.

Twenty-five percent of all of the programs surveyed offer management strategies to patients having vestibular system disorders. However, none offer support groups for patients having vestibular disorders.

In the programs that evaluate patients for CAPD, clients and families are counseled by the audiology students concerning test results and remediation strategies in 80 percent of the programs. However, only a small percentage (25%) of the programs report offering phonemic synthesis therapy, with more (43%) offering auditory skills enhancement therapy to clients. School visits conducted by graduate students for children diagnosed with CAPD are made by only 28 percent of the programs.

Interviewees from 32 percent of the programs felt that “extreme importance” was placed on education and clinical use of aural rehabilitation strategies for the hearing impaired. Only 18 percent of the faculty members surveyed report that their programs place “extreme importance” on clinical use of aural rehabilitation for patients having cochlear implants, with 55 percent placing “importance” in this area. Responses from the faculty ranged from placing “extreme importance” (10%) to “importance” (48%) for the education of management strategies for the tinnitus sufferer. The faculty surveyed report placing anywhere from “extreme importance” (15%) to “importance” (65%) for teaching clinical use of vestibular testing and client rehabilitation. Finally, the faculty surveyed report placing anywhere from “extreme importance” (20%) to “importance” (45%) on evaluation and rehabilitation of patients having CAPD (Fig. 2).

DISCUSSION

One purpose of this research project was to determine whether weaknesses exist in the training of audiology graduate students in aural rehabilitation in ASHA-accredited audiology programs. Through the results obtained on our survey of 40 graduate programs in the U.S., we were able to identify the areas of aural rehabilitation in which students are receiving the most as well as the least training clinically.

Campus Clinics and Audiology Program Information

Only 23 percent of the programs surveyed had medical schools located within their university. The majority of these programs were in the southwest, and none of the programs sur-
veyed in the northwest were affiliated with medical schools. Audiology as a field is becoming more diverse and audiologists are offering more services to their clients. In many employment settings, audiologists are now expected to be able to provide advanced skills such as assisting in the operating room with interoperative evoked potential monitoring and extensively evaluating the integrity of the vestibular system. If more training programs are located at universities housing medical schools and hospitals, the students in these programs may have more and better opportunities to get hands-on experience in these aspects of the field. Of the 23 percent of schools that had aligned hospitals, only 77 percent rotate their students through these hospitals as internship sites.

Every program surveyed for this study operates an audiology clinic on campus. One of the most surprising findings of this survey is that the most commonly offered services provided by campus audiology clinics is evaluations for CAPDs. We consider this finding surprising because of the controversy that surrounds even the very existence of such a disorder. One faculty member surveyed reported that his program had a strong philosophy that CAPD should be viewed as a learning disability so they do not perform these evaluations. Yet other programs, such as our own, view CAPD evaluations as important, and we have seen the requests for these evaluations for adult and pediatric patients grow in demand every year. More programs located on small college campuses are evaluating patients for CAPD than medium and large campus programs. Also, more programs in the northwest are offering these evaluations than in any other geographic area surveyed (Fig. 3).

The second most commonly provided service in campus audiology clinics is hearing aid dispensing. We had anticipated that this would be the most common service provided by the clinics, but we had not anticipated the large percentage of programs involved in dispensing CIC and programmable hearing aids. This finding is encouraging and indicates that many students are receiving training on the latest advances in the hearing aid industry. Programs located in mid-sized university campuses are dispensing more hearing aids than other campuses, and more schools in the southwest, the area with the greatest concentration of medical school affiliations, are dispensing aids than programs in any other area. These southwestern programs are dispensing more of each type of hearing aid available on the market than the other programs as well (Fig. 4).

The two procedures lacking in adequate provision through on-campus clinics were vestibular testing and work with cochlear implant recipients. Only slightly more than half of the programs provide electronystagmographic (ENG) testing in their clinics, and only 8 percent offer rotary chair or computerized dynamic posturography. Only 28 percent of the audiology clinics work with cochlear implant programs to participate with pre- and postoperative evaluations of CI recipients. More small campus programs offer ENG testing than other sized campus programs, but none of these small campus programs surveyed offer CDP or rotary chair eval-
uations. Also, more northwestern programs offer ENG testing, but none of these schools are offering CDP or rotary chair testing. None of the small campus programs surveyed work with cochlear implant patients, but the majority of programs that do work with these patients are located on large campuses. More of the southwestern schools are working with cochlear implant patients, and these are the same schools that are more often affiliated with medical schools.

This minimal amount of on-campus clinical training in vestibular testing and testing of cochlear implant users was disappointing. Vestibular laboratories are becoming more common in hospitals and private practices, and adequate training in the use of the equipment is important. Also, with advancing technology, more hearing-impaired children and adults may be receiving cochlear implants. Audiology graduate students should be exposed to the test batteries used in evaluating candidates for cochlear implant devices. We feel that more emphasis should be placed in these areas.

**Perceived Importance of Aural Rehabilitation**

The findings in this section were of great interest to us, especially when placed side by side with the other data obtained in this survey. Of all of the procedures offered by the programs surveyed, evaluations and remediation of vestibular system disorders was perceived by the programs surveyed as having the most importance placed upon it. More of the southwestern programs perceive themselves as placing extreme importance on rehabilitation of vestibular system disorders than other programs, as did more of the programs located on mid-sized college campuses than other sized campuses. However, the vast majority of these programs do not have vestibular laboratories to evaluate clients having these disorders, and only 25 percent provide any rehabilitation to these clients. If this is the most important aspect of audiology being taught to students, then it follows that more should be receiving practical experience in vestibular diagnostic evaluations and rehabilitation.

Rehabilitation for patients wearing hearing aids was ranked second highest in perceived importance and highest in perceived extreme importance. The programs in the southeast and northeast report placing more extreme importance on this type of rehabilitation than the other programs, as did the programs located on large college campuses. The education and rehabilitation of cochlear-implant recipients was ranked third in perceived importance by the programs surveyed. However, only 28 percent of these audiology clinics even participate in cochlear implant programs. The programs located on small campuses and in campuses in the northeast perceived more extreme importance being placed on cochlear implant rehabilitation. There appears to be a discrepancy in the perceived importance placed upon the procedure and the actual teaching of diagnostic and rehabilitation skills.

We found the most common procedure provided in campus clinics was evaluations for CAPD. More southwestern programs and more small programs perceive themselves as placing extreme importance on rehabilitation of patients diagnosed with CAPD than any other programs. However, the least number of programs providing evaluations for CAPD are located in the southwest. When asked what importance was placed upon evaluation and management of CAPD, we found that it was ranked as having the least amount of importance placed upon it, even less than for the management of tinnitus. Only 20 percent of the faculty surveyed responded that extreme importance and 45% responded that importance was placed upon teaching these skills. Thirty-five percent responded that not much importance is placed on these skills. These feelings can certainly affect the delivery of clinical service and the attitudes of the students providing them. If a student is taught that what they are doing is of little importance, then perhaps that is how the evaluation and rehabilitation will be treated. Given the rise in the diagnosis of young children with learning disabilities, attention deficit disorder, and attention deficit hyperactivity disorder, future audiologists will need to be skilled in the evaluation of CAPD and in providing parents and school systems with information and coping strategies for students with this disorder.

The only areas that were perceived by any of the programs to have no importance placed upon them were evaluation and treatment of patients with tinnitus and cochlear implant recipients.

**Summary**

Results of this study reveal the lack of training in aural rehabilitation that graduate-level audiology students are receiving in their
programs. Colleges and universities that offer a graduate program in audiology may consider the implications of this lack of training and use it to make necessary changes in their curricula. In addition, ASHA may consider adding more exact requirements for clinical hours dealing with these topics. These findings also may be used to meet the criticisms of existing master's programs by the proponents for the Au.D. Those areas proven weak in existing graduate-level programs may be targeted for improvement.

One weakness that this study may have encountered results from the faculty surveyed having knowledge of the survey's purpose. They may have biassed their answers and reported more training than actually is occurring. However, it is the hope of those involved in this present study that the faculty members surveyed provided answers that are accurate representations of the training that they offer their students. Other weaknesses involve the addition of audiology staff in the question regarding the number of faculty in audiology for each program. It is felt that had only audiology faculty been included then numbers would have been much fewer. Also, a question pertaining to the school or department that the audiology program is under would have been of interest to the study.

Based on the results, it appears that audiology graduate students are exposed to a wide range of patients having various pathologies and complaints in clinic campuses around the nation. However, these same students are not always receiving hands-on participation in the remediation and management of these patient's disorders. More emphasis is being placed on management of the hearing-impaired clients and clients with vestibular disorders than any other impaired populations of clients seen in these campus clinics. Unless graduate students receive appropriate training in the management of a variety of auditory disorders, they may not be adequately prepared to work with these patients when they graduate and enter the work force.

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REFERENCES


Appendix

Aural Rehabilitation Experience
Offered to Audiology Students in ASHA-Accredited Training Programs

Please choose the response that most appropriately describes the classes and clinical experiences that your graduate school offers its audiology graduate students in the area of aural rehabilitation.

GENERAL INFORMATION REGARDING THE GRADUATE PROGRAMS SURVEYED:

1. What is the average total number of audiology graduate students trained each year in the last 5 years?
   A. 1–5 (15%)  B. 6–10 (68%)
   C. 11–15 (13%)  D. More than 15 (5%)

2. What is the number of audiology faculty in the program?
   A. 1 (0%)  B. 2 (18%)
   C. 3 (20%)  D. More than 3 (63%)

3. Is your audiology program affiliated with a medical school or hospital? If no, skip to #5.
   A. Yes (22%)  B. No (78%)

4. If you answered yes to #3, do the audiology graduate students rotate through the campus hospital?
   A. Yes (77%)  B. No (23%)

5. What is the approximate size of your university?
   A. Less than 5000 students (8%)
   B. 6000 to 15,000 students (50%)
   C. More than 15,000 students (42%)

6. Is your college or university a public or private school?
   A. Public (90%)  B. Private (10%)

7. Is your audiology graduate program accredited by ASHA?
   A. Yes (100%)  B. No

8. In your audiology graduate program, what is the importance placed on teaching aural rehabilitation skills?
   A. None (0%)  B. Very little (8%)
   C. Some (32%)  D. Great importance (60%)
HEARING AIDS:
9. Does your university offer a graduate level course in aural rehabilitation?
   A. Yes (93%)  B. No (14%)
10. Does your teaching facility operate an audiology clinic?
    A. Yes (100%)
    B. No (If no, skip to question #15)
11. Does your audiology clinic dispense hearing aids to clients?
    A. Yes (75%)
    B. No (25%) (If no, skip to question #13)
12. What types of hearing aids do you dispense?
    A. BTEs Yes (78%)  No (23%)
    B. ITEs Yes (78%)  No (23%)
    C. CICs Yes (68%)  No (32%)
    D. Programmables Yes (70%)  No (30%)
13. Does your campus audiology clinic currently assist hearing-impaired clients by ordering any necessary or desired ALDs?
    A. Yes (88%)
    B. No (12%)
14. Do audiology students participate in hearing aid orientation or in the counseling of clients about hearing aid use?
    A. Yes (100%)
    B. No
15. Does your audiology clinic offer aural rehabilitation therapy to hearing-impaired clients either individually or in group sessions?
    A. Speechreading
       Yes (88%)  No (12%)
    B. Listening skills (auditory training)
       Yes (75%)  No (25%)
    C. ALDs
       Yes (80%)  No (20%)
16. Do your audiology students participate with various support groups for hearing-impaired individuals (i.e., Self-Help for the Hard of Hearing [SHHH], the Alexander Graham Bell Association, etc.)?
    A. Yes (30%)
    B. No (70%) (If no, skip to question #18)
17. Please list the support groups with which your audiology graduate students participate.
18. How much importance does your graduate audiology program place on the education of and clinical use of aural rehabilitation strategies (i.e., speechreading, listening skills, coping strategies, etc.) for hearing-impaired clients?
    A. Extreme importance (33%)
    B. Importance (64%)
    C. Not much importance (3%)
    D. No importance (0%)

COCHLEAR IMPLANTS
19. Does your campus audiology clinic participate in a cochlear implant program?
    A. Yes (28%)
    B. No (72%) (If no, skip to question #22)
20. Do the audiology graduate students in your campus hearing clinic participate in the preoperative cochlear implant workup?
    A. Yes (23%)
    B. No (77%)
21. Do the audiology graduate students participate in the postoperative therapy (counseling, mapping, school visits) of cochlear implant clients?
    A. Yes (25%)
    B. No (75%)
22. How much importance does your graduate audiology program place on exposing students to pre- and postoperative counseling for cochlear implant clients?
    A. Extreme importance (18%)
    B. Importance (55%)
    C. Not much importance (18%)
    D. No importance (9%)

TINNITUS
23. Does your campus audiology clinic provide information to clients concerning the possible causes of and management strategies for tinnitus?
    A. Yes (90%)
    B. No (10%)
24. Does your campus audiology clinic offer a tinnitus support group or information concerning support groups to clients having complaints of tinnitus?
    A. Yes (63%)
    B. No (37%) (If no, skip to question #26)
25. If you answered yes to question #24, please briefly describe the support group or information concerning support groups given to clients complaining of tinnitus.
26. How much importance does your graduate audiology program place on the education of the graduate students on tinnitus management?
    A. Extreme importance (10%)
    B. Importance (48%)
    C. Not much importance (40%)
    D. No importance (2%)

DIZZINESS
27. Does your campus audiology clinic evaluate patients with complaints of dizziness or vertigo?
    A. Yes (50%)
    B. No (50%)
28. Does your audiology clinic presently have a vestibular laboratory to evaluate dizziness?
    A. Yes (38%)
    B. No (62%)
29. Does your campus audiology clinic offer the following testing for patients complaining of dizziness or vertigo?
   A. ENG Testing  Yes (55%)  No (45%)
   B. Posturography  Yes (8%)  No (92%)
   C. Rotary chair  Yes (8%)  No (92%)
30. If you answered yes to any of the tests in question #29, do your audiology graduate students participate in any of this testing?
   A. Yes (35%)  B. No (65%)
31. Do your audiology graduate students participate in rehabilitation therapy for clients having vestibular disorders?
   A. Yes (25%)  B. No (75%)  (If no, skip to question #33)
32. If you answered "yes" to question #31, please briefly describe the type of therapy provided by your clinicians.
33. Does your audiology clinic offer a support group for clients having vestibular disorders?
   A. Yes (0%)  B. No (100%)  (If no, skip to question #35)
34. Do your audiology graduate students attend these groups?
   A. Yes (0%)  B. No (100%)
35. How much importance does your graduate program place on education of and clinical use of vestibular testing and client rehabilitation?
   A. Extreme importance (20%)  B. Importance (45%)  C. Not much importance (35%)  D. No importance (0%)

**SUMMARY**

43. Overall, how much of the clinical services provided by your campus audiology clinic are diagnostic services (in estimated percent)?
   A. 0–25% (3%)  B. 26–50% (20%)  C. 51–75% (52%)  D. 75–95% (25%)  E. 95–100% (0%)
44. Overall, how much of the clinical services provided by your campus audiology clinic are rehabilitative services (in estimated percent)?
   A. 0–25% (25%)  B. 26–50% (50%)  C. 51–75% (25%)  D. 75–95% (0%)  E. 95–100% (0%)
45. Have you noticed a change in the amount of rehabilitation requested by your clients over the past 3 years?
   A. More (37%)  B. Less (13%)  C. Same (50%)
46. How much emphasis do you think should be placed on aural rehabilitation skills for graduate students in Au.D. programs?
   A. Same as master’s level requirements (40%)
   B. More than master’s level requirements (60%)

**CENTRAL AUDITORY PROCESSING DISORDERS**

36. Does your campus audiology clinic perform evaluations for CAPD?
   A. Yes (88%)  B. No (12%)
37. If you answered "yes" to question #36, please list the test protocol used by your campus hearing clinic in evaluating CAPD for adults and for children.
38. Do your audiology graduate students provide phonemic synthesis therapy to clients diagnosed as having CAPD?
   A. Yes (25%)  B. No (75%)
39. Do your audiology graduate students provide auditory skills enhancement therapy for clients diagnosed as having CAPD?
   A. Yes (43%)  B. No (57%)
40. Do your audiology graduate students counsel clients and/or family concerning CAPD and possible remediation strategies?
   A. Yes (80%)  B. No (20%)
41. Do your audiology graduate students participate in school visits for children diagnosed as having CAPD in order to make recommendations to parents and teachers regarding changes in the child's educational settings that may improve his/her school performance?
   A. Yes (28%)  B. No (72%)
42. How much importance does your graduate audiology program place on education of and clinical use of CAPD testing and rehabilitation?
   A. Extreme importance (20%)  B. Importance (45%)  C. Not much importance (35%)  D. No importance (0%)