Research Note

Promoting Hearing Health Collaboration Through an Interprofessional Education Experience

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Purpose: To enhance audiology and physician assistant (PA) student appreciation for collaboration/team-based care through an interprofessional educational activity focused on hearing assessments.

Method: A total of 18 students from Louisiana State University Health–New Orleans’s audiology and PA programs participated in an optional interprofessional education learning opportunity, which included a demonstration of hearing assessments. To assess student perspectives regarding interprofessional learning, the students completed pre- and post-surveys.

Results: Eighteen students completed a survey, including 5 questions using a Likert scale and 1 open-ended

question. Both audiology and PA students demonstrated significant statistical improvement in 2 interprofessional competencies: roles/responsibilities and interprofessional communication. Students also reported increased awareness and knowledge in the skills of the opposite professions as related to hearing assessments.

Conclusion: Integrating interprofessional education experiences within an audiology program promotes collaborative practice patterns and supports new educational accreditation standards.

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Age-related hearing loss or presbycusis can have a profound effect on healthy aging (Davis et al., 2016). Approximately 40% of older adults between the ages of 65 and 84 have hearing loss, and the prevalence increases to 66% for adults over the age of 85 (National Academy of Sciences, 2014). Most older adults consider loss of hearing as a normal aging process and do not seek treatment. Less than one in seven older adults in the United States who have hearing loss use hearing aids (Chien & Lin, 2012). Unfortunately, the current hearing health system in the United States is fragmented and lacks the coordination needed to support healthy aging (National Academy of Sciences, 2014).

Healthy People 2020, a U.S. Health and Human Services initiative, is focused on improving the health of all Americans. Healthy People 2020 has identified 42 core topic areas, each area having multiple health objectives and respective health targets (Healthy People 2020). Acknowledging common health concerns and establishing national health targets can assist the coordination among health professionals caring for older adults with hearing loss.

Specific to the practice of audiology, one of the Healthy People 2020 core topic areas is hearing and other sensory or communication disorders. Healthy People 2020 hearing health objectives specific to older adults include increasing the proportion of individuals who have a regularly scheduled hearing examination, providing hearing aids or cochlear implants for those who have hearing impairments, and increasing referrals from a primary care provider to an audiologist for hearing screen and treatment (Healthy People 2020).

Even though a referral is not required for audiology services in all states, a comprehensive team approach or interprofessional collaboration can assist in improving hearing health. Most primary care providers do not consistently assess hearing due to lack of time, other health concerns that take priority, and lack of reimbursement (Chou, Dana, Bougatsos, Fleming, & Beil, 2011). However, primary care providers can initiate a hearing assessment and

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support hearing health through a referral to an audiologist (Holliday, Jenstad, Grosjean, & Purves, 2015). Therefore, increasing primary care provider awareness of the roles and responsibilities of an audiologist could positively impact healthy aging, hearing health, and Healthy People 2020 objectives.

The World Health Organization (WHO) defines interprofessional collaborative practice (IPCP) as “when multiple health workers from different professional backgrounds work together with patients, families, carers [*sic*], and communities to deliver the highest quality of care” (WHO, 2010). However, health care providers in the United States lack the teamwork training that is needed to be members of effective teams (Interprofessional Education Collaborative [IPEC], 2011). Effective collaboration is not an inherent skill; it must be learned and practiced (Baker, Day, & Salas, 2006). Hence, the term interprofessional education (IPE) is foundational to IPCP.

IPE is defined as “when students from two or more professions learn about, from and with each other” (WHO, 2010). An increasing number of education accrediting bodies, including the Council on Academic Accreditation for Audiology and Speech-Language Pathology, are requiring IPE in health care curricula. Effective 2017, there will be new academic standards for audiology students. Audiology programs will be required to demonstrate how students are prepared to (a) understand how to work on interprofessional teams to maintain a climate of mutual respect and shared values, (b) understand the roles and importance of interdisciplinary/interprofessional assessment and intervention and be able to interact and coordinate care effectively with other disciplines and community resources, (c) understand how to perform effectively in different interprofessional team roles to plan and deliver care—centered on the individual served—that is safe, timely, efficient, effective, and equitable, and (d) understand how to apply values and principles of interprofessional team dynamics (Council on Academic Accreditation for Audiology and Speech-Language Pathology, 2016).

At Louisiana State University Health–New Orleans (LSUHNO), the Center for Interprofessional Education and Collaborative Practice (CIPECP) assists health care professional programs to achieve IPE academic accreditation standards. The goal of the CIPECP is to coordinate student education across all six schools by utilizing a team-based, patient-centered approach that delivers the highest quality of care resulting in improved health outcomes. With the goal of improving health care services to patients through a collaborative approach, a course director from the audiology and physician assistant (PA) program and a director from the CIPECP developed an IPE experience as a pilot project. The course directors’ intent was to determine the effectiveness of the IPE experience prior to curriculum integration.

The clinical focus of the case-based educational session was hearing assessments. Some adults with hearing impairments seek assistance from a general physician practitioner, an ear, nose, and throat physician specialist,

or a hearing-aid clinic (Levesque et al., 2012). Since adults enter the hearing health industry from different providers, this IPE experience provided students from each profession the time to demonstrate a standard hearing exam according to their academic training.

The IPE learning objectives included two IPEC competencies. IPEC is a national organization that supports and guides IPE and IPCP. In 2011, IPEC published four interprofessional core competencies that educational institutions and health systems can utilize to guide the development of IPE learning activities. The four competencies are values and ethics, roles/responsibilities (RR), interprofessional communication (CC), and teams and teamwork (IPEC, 2011). The IPE student learning objectives for the case-based activity were based on the following two IPEC subcompetencies:

1. Describe how professionals in health and other fields can collaborate and integrate clinical care and public health interventions to optimize population health (roles/responsibilities subcompetency [RR10]).
2. Communicate information with patients, families, community members, and health team members in a form that is understandable, avoiding discipline-specific terminology when possible (interprofessional communication subcompetency 2 [CC2]).

It is common to use the Kirkpatrick Model to evaluate the effectiveness of student IPE training (Kirkpatrick & Kirkpatrick, 2006). The Kirkpatrick Model includes four levels: (a) Reaction, (b) Learning, (c) Behavior, and (d) Results. Levels 1 and 2 are most commonly assessed in educational environments, as levels 3 and 4 require assessment in practice, which occurs after students graduate. Barr, Koppel, Reeves, Hammick, and Freeth (2005) expanded the original four-level model to six categories to distinguish outcomes related to people and outcomes impacting service delivery. Specific to the pilot project, the authors focused on assessing Level 1 (Reaction) and Level 2a (Learning)—Modification of perceptions and attitudes (Barr, Koppel, Reeves, Hammick, & Freeth, 2005). Therefore, an assessment tool was developed to measure student views on the IPE experience (Level 1) and changes in perceptions related to IPEC subcompetencies (Level 2a).

Method

Students engaged in the audiology and PA programs were asked by respective faculty members to participate in an optional IPE activity focused on hearing assessments. The entire length of the IPE learning experience was 2 hours and was scheduled during a time that did not interfere with regularly scheduled classes. Students were provided an IPE session document at the beginning of the class session. The IPE session document outlined information regarding the case, time schedule, learning objectives, demonstration activities, and stimulus questions (Supplemental Material S1). A grade was not associated with the learning activity.

The clinical paper-based case involved an older adult with chronic hearing loss. In eight groups with at least one student from each program, both audiology and PA students demonstrated their professional training related to a hearing assessment history and exam.

Participants

Student participants were enrolled in LSUHNO and represented the audiology and PA programs. Eighteen students participated in the 2-hr elective IPE opportunity: ten from the audiology program and eight from the PA program. The audiology students were in the third year of their 4-year program, and the PA students were in the first year of their 29-month program.

Study Design

Students were asked to complete pre- and post-surveys using an electronic device during dedicated classroom time. The surveys gathered student perceptions of achievement of IPEC subcompetencies RR10 and CC2, future application of the IPE experience, and evaluation of the IPE experience.

Data Analysis

In order to assess student perspectives, a survey was administered. The survey included five questions using a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Basic demographic data were collected, such as gender, program, year of study, and engagement in a previous IPE activity. On both pre- and post-surveys, two questions assessed perceptions of IPEC subcompetencies, and three questions on the post-survey targeted student perceptions of the IPE activity. An open-ended question was also included on the post-survey asking the students, “Once you graduate and enter your profession, how will this experience change how you interact with the other professions represented today?”

Prior to analysis of quantitative data, the data set was cleaned to include paired pre–post completed surveys. All analyses were performed using the Statistical Analysis System (version 9.4). The pre–post paired comparisons were carried out using the Wilcoxon signed-rank test. A point biserial correlation was used to measure the relationship between a previous IPE activity and IPEC subcompetency scores.

Results

Quantitative

Pre- and post-surveys were offered to 18 students in the audiology ($n = 10$) and PA ($n = 8$) programs. Seventeen female students and one male student completed both pre- and post-surveys. Twelve students had not previously engaged in an IPE activity, and six students had previously engaged in at least one IPE activity.

A statistically significant improvement in both IPEC subcompetencies was observed for all students, the audiology student group, and the PA group. A summary of the assessment of IPEC subcompetencies across student groups is provided in Table 1.

Table 2 provides means of student evaluation of the IPE exercise across all students. There was a more even distribution of responses (*agree* and *strongly agree*) for the question, “This IPE classroom experience provided sufficient time to learn from, about, and with other students.” However, student responses of *agree* and *strongly agree* for all three questions support the accomplishment of IPE activity objectives.

Open-Ended Question

On the post-survey, students were asked, “Once you graduate and enter your profession, how will this experience change how you interact with the other professions represented today?” Seventeen students responded to the question: nine audiology students and eight PA students. Student responses, one to two sentences in length, were analyzed for themes. The PA course director and the CIPECP director reviewed the data independently and identified predominant IPEC competency themes. A consensus was reached on themes. A thematic analysis of student statements supported learning in all four IPEC competencies. The majority of students noted improvement in their knowledge of the roles and responsibility competency. A couple of examples are noted as follows:

This experience enlightened me to the necessity of PA and their knowledge base. They do a lot of tests on the ears that would allow them to make the proper referral to audiologist or ENTs (Audiology student).

This experience has opened my eyes to the audiology profession. I know better when to appropriately refer to an audiologist as well as the extent of what they can do to treat a patient with hearing loss. This will allow for better collaboration between the two professions (PA student).

Discussion

Health care professional students who are trained in an interprofessional manner are more likely to form collaborative practice patterns after graduation (Pecukonis, Doyle, & Bliss, 2008). Therefore, it has become increasingly important to prepare health care professional students to collaborate and work in teams. There is a need for primary care providers and audiologists to work together to improve the hearing health in older adults (Jenstad & Donnelly, 2015). As PAs are trained as primary care providers, a team effort between audiologists and PAs can help increase community awareness about the benefits of audiological rehabilitation (Öberg, 2015).

In a recent workshop that gathered health professional educators, accreditors, and others to explore the role

Table 1. Assessment of IPEC subcompetencies across student groups.

IPEC subcompetency	Student group	Pre-survey mean (standard deviation)	Post-survey mean (standard deviation)	Post- minus pre-survey mean (standard deviation)	p Value
RR10	All students	3.05 (0.41)	4.11 (0.47)	1.05 (0.42)	<.0001 ^a
	Audiology	3.00 (0.47)	4.10 (0.31)	1.10 (0.32)	.0020 ^a
	Physician assistant	3.12 (0.35)	4.12 (0.64)	1.00 (0.53)	.0156 ^a
CC2	All students	3.52 (0.71)	4.33 (0.48)	0.82 (0.63)	.0005 ^a
	Audiology	3.66 (0.70)	4.40 (0.51)	0.78 (0.67)	.0313 ^a
	Physician assistant	3.38 (0.74)	4.25 (0.46)	0.87 (0.64)	.0313 ^a

Note. RR10 = roles/responsibilities subcompetency 10; CC2 = interprofessional communication subcompetency 2; IPEC = Interprofessional Education Collaborative.

^aDenotes statistical significance.

of health profession accreditation, a new vision for health profession education was proposed. The vision emphasized focusing health education on the overall health and well-being of individuals and the population instead of health care alone (National Academy of Sciences, 2016). The proposed IPE experience supported the new vision through the incorporation of Healthy People 2020 objectives.

Specific to Healthy People 2020 hearing objectives, this IPE experience has encouraged PA students to be more proactive in asking about and assessing hearing health, as noted in PA student responses to the open-ended survey question. Audiology students also provided a new perspective regarding additional questions that could be incorporated into an exam to warrant an audiology referral depending on patient answers to the questions posed. Audiology students discussed a basic audiological test battery and respective results that indicate hearing loss. This IPE experience promoted teamwork and improved communication among these student professionals.

It was evident that learning occurred beyond the targeted IPEC subcompetencies from the thematic analysis of the open-ended question. Due to the spontaneous nature of interprofessional experiences, learning beyond target outcomes is expected (Gunaldo, Brisolara, Davis, & Moore, 2017). Encouraging students to learn from, about, and with each other allows for the development of unique experiences within each group.

Increased knowledge of provider roles can assist in building trusting relationships. Students exposed to the roles and responsibilities of various health professionals while in school provides a foundation from which to build clinical relationships once in practice. In addition, increased awareness of national health goals provides students from different professions the opportunity to discuss how collaboration can help achieve better population health.

The limitations of the pilot project included using a small number of students, and all students were from one institution. However, the response from the students was overwhelmingly positive, with students requesting more time for discussion within small groups. Educators should be aware of the Dunning–Kruger effect when evaluating single IPE experiences, as students can assess their level of competence at a higher level than their ability (Kruger & Dunning, 1999).

Another limitation of the pilot project included the use of an institutional framework to assess student learning based upon the IPEC subcompetencies. There are reliable and valid IPE assessment tools that utilize a Likert scale to assess student attitudes or perceptions, such as the Readiness for Interprofessional Learning Scale (McFadyen, Webster, & Maclaren, 2006) or the Students Perceptions of Interprofessional Clinical Education–Revised (Zorek et al., 2016). However, these tools focus on general concepts related to IPE, such as patient outcomes, roles, and teamwork, whereas

Table 2. Student evaluation of the IPE activity.

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
This IPE classroom experience increased my knowledge of the hearing assessment conducted by an audiologist or physician assistant.	0%	0%	0%	23.53% (4)	76.47% (13)
This IPE classroom experience provided sufficient time to learn from, about, and with other students.	0%	0%	0%	47.06% (8)	52.94% (9)
This IPE classroom experience increased my appreciation of the collaborative efforts needed to improve Healthy People 2020 population health indicators, such as increasing the number of hearing screenings conducted by a health provider.	0%	0%	0%	33.33% (6)	66.67% (12)

Note. Number of students is in parentheses. IPE = interprofessional education.

LSUHNO's student learning assessment is directly aligned with IPEC subcompetencies. Recent research by Dow, DiazGranados, Mazmanian, and Retchin (2014) and Lockeman et al. (2016) have investigated the use of assessment tools related to IPEC competencies. Further research regarding the use of IPE assessment tools is needed in the United States.

This IPE experience could be improved by integrating the learning activity into existing courses, making participation a requirement for all audiology and PA students. In addition, increasing the number of academic programs, such as nurse practitioner and medicine, involved in the IPE experience can assist in promoting awareness of hearing health among various disciplines.

Conclusion

Offering IPE opportunities within the audiology curriculum is an effective method to improve health care students' perceptions of IPCP. Developing and implementing IPE experiences between audiology and PA students can influence practice patterns to improve healthy aging and hearing health for the communities the students will serve. Additional research and longitudinal studies are needed to draw conclusions regarding IPE and its impact on collaborative practice (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). However, collaborative practice is noted by international and national health organizations as a necessary component to effective and efficient health care delivery.

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