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RESEARCH ARTICLE

An interprofessional forum to improve students' empathetic awareness of experiences of people from different racial or ethnic groups

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Abstract

Background: This study aimed to measure the impact of a large-scale interprofessional forum on students' ethnocultural empathy and interprofessional competencies. **Methods:** The activity involved asynchronous pre-work and a live online discussion, which involved small groups of students guided by a faculty facilitator. The pre-work comprised reviewing a case of an individual with multiple chronic health conditions. After the experience, students self-assessed their interprofessional competencies and ethnocultural empathy using the Interprofessional Collaborative Competency Attainment Survey Revised (ICCAS-R) and the Scale of Ethnocultural Empathy (SEE) scales. **Results:** Of the 808 students who completed the experience, 700 (87%) completed the post-experience survey. Significant increases were found in students' self-assessed interprofessional competencies (M = 3.55 to M = 4.15; $p < .001$) and empathic awareness (M = 4.95 to M = 5.19; $p < .001$). **Conclusion:** A large-scale interprofessional education activity can increase self-assessed interprofessional competence and empathic awareness.

Introduction

Interprofessional competencies, defined as the "*integration of knowledge, skills, and attitudes that define working together across professions to improve equitable health outcomes*," are critical to developing health profession students' training programmes (Interprofessional Education Collaborative, 2023). These competencies describe compulsory topics for effective interprofessional collaborative practice.

Embedded within these competencies, health professionals should "*practise cultural humility in interprofessional teamwork*" and "*communicate clearly with authenticity and cultural humility…*" (Interprofessional Education Collaborative, 2023). Cultural humility is "*the ability to recognise limitations to avoid making assumptions about other cultures, admitting that one does not know and is willing to learn from a patient, person, client, consumer, or community about their experiences while being aware of one's embeddedness in culture(s).*" (Interprofessional Education Collaborative, 2023.

Cultural differences between patients and health workers could have implications for health outcomes (Saha, 2006). Therefore, health professions training programmes should aim to develop cultural humility in students.

Ethnocultural empathy, defined as "*empathy directed towards people from racial and ethnic cultural groups who are different from one's ethnocultural group*," has been suggested as a concept to promote understanding between various groups (Wang, 2023). Developing ethnocultural empathy can enhance one's cultural humility (Kapıkıran, 2021).

Research related to ethnocultural empathy in health profession students is limited. Studies, in general, have been limited to one profession, such as physician

assistant (Domenech Rodriguez *et al.,* 2019) or nursing (Butte & Hristova, 2024; Lalande, 2024). One study compared differences in ethnocultural empathy between health professions students and found that some students may have different ethnocultural empathic skills at baseline (Rasoal *et al.,* 2009). Data on specific educational interventions that impact a student's ethnocultural empathy are scarce and would be of interest to educators within health professions training programmes as they seek to develop ethnocultural empathy and, ultimately, cultural humility in their learners. Data comparing ethnocultural empathy between students from different health professions training programmes may also be of value for a better understanding of how to tailor education to meet the needs of specific groups.

This study sought to measure the impact of a large-scale interprofessional forum on students' interprofessional competencies and ethnocultural empathy. It was hypothesised that this forum would have a positive impact on both. While ethnocultural empathy feeds into overall interprofessional competencies, it was essential to measure both to understand how the interprofessional forum influenced both ethnocultural empathy and interprofessional competencies, which support collaborative, team-based care.

Methods

The interprofessional forum

The interprofessional forum consisted of two parts. Participating students were enrolled in an administrative (i.e. non-credit bearing) course using this university's learning management system, where they accessed asynchronous pre-work (part one) to help them prepare for the live, online small-group discussion (part two) that occurred two weeks after the asynchronous pre-work (part one) was released. Table I summarises the interprofessional forum's learning objectives.

The asynchronous pre-work consisted of three elements. First, students were asked to prepare a short (1-2 minute) introduction where they (1) introduce themselves, their programme, and why they chose their programme and (2) share something interesting they did, personally or professionally, in the past year. Second, students were asked to prepare for an icebreaker activity (the unique/common exercise) where they would be called upon to share the unique aspects of their profession and identify where there is common ground among the professionals on their team. Last, students were asked to prepare for a case discussion by watching a short film (~20 minutes) that depicted a patient with multiple chronic health conditions and psychosocial issues that affected their daily lives. The film also had a cultural component, highlighting the intersection of culture and health on an individual's health goals. Due to licensing restrictions, the film cannot be shared publicly; however, a detailed description of the film and its design has been published (Fusco *et al.,* 2020). Appendix A provides additional case information on the film.

Students were asked to view the film through their professional lens to identify the following: (1) observed strengths, (2) challenges or problems, and (3) potential interventions that members of the interprofessional team could provide to address these challenges. They were also asked to consider these factors from both the patient and system levels, including healthcare system challenges, social determinants of health, and institutional or systemic barriers.

Table I: Interprofessional forum's learning objectives

Learning objective	Description
1	Communicate with team members from diverse professions about health and healthcare issues, patients, and populations using understandable and respectful terminology
2	Collaborate with other professionals and use collective expertise and existing evidence to develop strategies to optimise health care that is culturally relevant and contextually appropriate
3	Discuss the roles, strengths, and limitations of diverse professions and how they can work collaboratively to ensure the best individual and population health outcomes and effective team performance
4	Discuss structural issues present in this case that prevent optimal health for all

In the live part (part two), students participated in a single, 90-minute, faculty-facilitated, small-group online discussion conducted on Zoom. Each group included six to seven students representing six to seven health profession programmes and one faculty facilitator who guided the session. The discussion was structured into three parts: an introduction (15 minutes), a unique and common exercise (15 minutes), and the case discussion per se (60 minutes). Whiteboard technology was used to document and organise the discussion. Students were encouraged to contribute directly on the whiteboard by listing the strengths, challenges, problems, and interventions they identified while the faculty facilitator organised and guided their conversation. The small-group discussion

concluded with a short (10-minute) debriefing where students were asked to answer the following questions: (1) what is something new you learned about another profession; (2) how will your new knowledge about another profession influence your clinical practice; and (3) how will you apply this new knowledge when caring for people with chronic physical and mental health conditions?

Study procedures

The study employed an observational retrospective pre/post-activity design and was conducted in March 2023 at one university located in an urban setting in the Northeast United States of America. Students participating in the interprofessional forum were from various health profession programmes: audiology and speech/language pathology, dental medicine, medicine, nursing, occupational therapy, physical therapy, pharmacy, public health, and social work. Students' years of study varied across programmes due to differences in programme lengths; however, students were neither in their first year nor in their final year of study. This selection ensured students had begun developing a professional identity, although it was not yet fully formed. For example, pharmacy students were in year two of a four-year programme. Students across the other health professions were similarly at or near the midpoint of their training programmes (e.g. year two of four).

After participating in the interprofessional forum, students were asked to complete an online, anonymous survey of multiple parts. The survey was voluntary and did not affect students' grades. First, students answered questions about their age, gender identity, and previous interprofessional experience. Next, students completed the Interprofessional Collaborative Competency Attainment Survey Revised (ICCAS-R). The reliability and validity of this instrument have been examined with participants from various health profession programmes, with evidence supporting its use for measuring self-reported retrospective pre- and post-interprofessional education collaborative abilities (Archibald *et al.,* 2014; Schmitz *et al.,* 2017). The ICCAS-R consists of 20 items rated on a five-point Likert scale, and evidence suggests that the use of a total average score is justifiable for assessment and evaluation (Schmitz *et al.,* 2017). The ICCAS-R was used to assess the forum's impact on students' interprofessional competencies. Last, students were asked to complete two subscales of the Scale of Ethnocultural Empathy (SEE) (Wang *et al.* 2003). This self-report instrument measures ethnocultural empathy, i.e. empathy towards people of different racial and ethnic backgrounds, and was developed based on a theoretical model of cultural empathy. Two subscales (acceptance of cultural differences and empathic awareness) were selected because they aligned with the learning outcomes of the intervention. The reliability and validity of the SEE were initially examined with undergraduate students (Wang *et al.,* 2003) and later used with healthcare students (Fleming *et al.,* 2015; Domenech Rodriguez *et al.,* 2019). The SEE consists of 31 items distributed on four subscales and rated on a 6-point Likert scale. The acceptance of cultural differences subscale includes five items, while the empathic awareness subscale encompasses four items. These subscales were administered as a retrospective pre- and post-assessment (like the ICASS-R). A mean score was calculated for each student (pre- and post-participation) on the acceptance of cultural differences and empathic awareness. The reliability of the pre- and post-experience scale scores was estimated using Cronbach's α (Kline, 2000). Ideally, Cronbach's α reliabilities of .90 or above are desired but not below .70, indicating that the items may not measure the same underlying construct.

A repeated measures analysis of variance (ANOVA) was conducted, with student programmes as a predictor variable, to examine the differences in mean scores between students of various programmes. The ANOVA results were statistically significant ($p < .05$), suggesting differences in change among the groups. Therefore, descriptive statistics were used to summarise mean scores by programme, both pre- and post-experience. Additionally, paired sample t-tests were conducted for each group using a Bonferroni adjustment. A p-value of $< .05$ was considered significant. Effect sizes (Cohen's d) were computed for each comparison to estimate the magnitude of the observed differences; they were interpreted as follows: values below 0.2 were considered very small and negligible, values between 0.2 and 0.5 were considered small but meaningful, values between 0.5 and 0.8 were interpreted as medium, and values above 0.8 were considered large (Cohen, 1988).

All statistical analyses were conducted using IBM Statistical Package for Social Science (SPSS) Version 26 software (IBM Corp, Armonk, NY). For all statistical tests, p-values of $< .05$ were considered statistically significant.

Results

A total of 808 students attended the forum and were invited to complete the survey. Of these, 700 (87%) responded and were included in the analyses. The distribution of students across programmes and their demographic characteristics are presented in Table II.

Table II: Students' self-reported characteristics according to the professional programme

Items	A&SLP (n=48)	DM (n=107)	M (n=159)	N (n=82)	OT&PT (n=75)	P (n=79)	PH (n=101)	SW (n=49)	Overall (N=700)
Age M (SD)	24.0 (3.2)	28.2 (6.1)	26.4 (2.5)	23.1 (4.8)	22.6 (1.9)	22.7 (3.1)	26.5 (6.9)	32.6 (11.0)	25.8 (5.9)
Gender[a]									
Male	1 (2.1)	54 (50.5)	68 (42.8)	16 (19.5)	22 (29.3)	24 (30.4)	18 (17.8)	10 (20.4)	213 (30.4)
Female	44 (91.7)	48 (44.9)	85 (53.5)	64 (78.0)	52 (69.3)	55 (69.6)	79 (78.2)	39 (79.6)	466 (66.6)
Non-Binary	1 (2.1)	0 (0.0)	3 (1.9)	2 (2.4)	1 (1.3)	0 (0.0)	1 (1.0)	0 (0.0)	8 (1.1)
Gender fluid	1 (2.1)	1 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	3 (0.4)
Prefer to self-describe	0 (0.0)	2 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	3 (0.4)
Missing	1 (2.1)	2 (1.9)	3 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	7 (1.0)
Interprofessional experiences[a]									
Previous academic experience	22 (45.8)	43 (40.2)	103 (64.8)	47 (57.3)	51 (68.0)	41 (51.9)	47 (46.5)	15 (30.6)	369 (52.7)
Work or clinical experience	15 (31.3)	39 (36.4)	123 (77.4)	60 (73.2)	28 (37.3)	37 (46.8)	46 (45.5)	25 (51.0)	373 (53.3)
Related to a health worker	27 (56.3)	43 (40.2)	66 (41.5)	42 (51.2)	39 (52.0)	43 (54.4)	35 (34.7)	17 (34.7)	312 (44.6)
Previous health professions degree	6 (12.5)	11 (10.3)	18 (11.3)	18 (22.0)	3 (4.0)	2 (2.5)	24 (23.8)	1 (2.0)	83 (11.9)
University at Buffalo interprofessional education curriculum	26 (54.2)	96 (89.7)	143 (89.9)	38 (46.3)	45 (60.0)	43 (54.4)	60 (59.4)	19 (38.8)	470 (67.1)
No prior experiences	7 (14.6)	3 (2.8)	2 (1.3)	11 (13.4)	7 (9.3)	10 (12.7)	15 (14.9)	11 (22.4)	66 (9.4)

[a] Presented as n (%)

A&SLP: Audiology and Speech Language Pathology; DM: Dental Medicine; M: Medicine; N: Nursing; OT&PT: Occupational Therapy & Physical Therapy; P: Pharmacy; PH: Public Health; SW: Social Work

Mean pre- and post-experience scores for each programme on the scales and subscales are reported in Table III, along with the mean difference and results from the paired sample *t*-tests. Visual representations of the mean pre- and post-experience scores for each programme are provided in Figures 1 (ICCAS-R), 2 (Empathic Awareness Subscale), and 3 (Acceptance of Cultural Differences Subscale).

Table III: Comparison of pre- and post-experience scale average means within programmes (N=700)

Subscale	Pre α	Post α	Pre M (SD)	Post M (SD)	Difference M (SD)[a]	Cohen's d	Magnitude of effect[b]
ICCAS-R overall[d]	.98	.98	3.55 (0.72)	4.15 (0.65)	0.60 (0.62)***	0.88	large
Audiology & speech and language pathology (n=48)	.96	.97	3.36 (0.61)	4.13 (0.56)	0.77 (0.59)***	1.31	large
Dental medicine (n=107)	.98	.99	3.43 (0.72)	3.99 (0.72)	0.55 (0.59)***	0.77	medium
Medicine (n=159)	.99	.99	3.87 (0.78)	4.16 (0.77)	0.29 (0.79)***	0.38	small
Nursing (n=82)	.97	.97	3.48 (0.67)	4.22 (0.55)	0.74 (0.49)***	1.21	large
Occupational therapy & physical therapy (n=75)	.97	.97	3.44 (0.69)	4.17 (0.57)	0.73 (0.39)***	1.16	large
Pharmacy (n=79)	.97	.98	3.24 (0.67)	4.01 (0.64)	0.77 (0.57)***	1.18	large
Public health (n=101)	.95	.96	3.65 (0.55)	4.32 (0.49)	0.68 (0.50)***	1.30	large
Social work (n=49)	.98	.98	3.49 (0.81)	4.22 (0.66)	0.73 (0.53)***	0.98	large
SEE - Empathic awareness[d]	.97	.98	4.95 (0.91)	5.19 (0.98)	0.23 (0.53)***	0.25	small

Subscale	Pre α	Post α	Pre M (SD)	Post M (SD)	Difference M (SD)[a]	Cohen's d	Magnitude of effect[b]
Audiology & Speech and language pathology (n=48)	.95	.96	4.99 (0.92)	5.26 (1.01)	0.27 (0.47)***	0.27	small
Dental medicine (n=107)	.98	.99	4.35 (1.21)	4.64 (1.43)	0.29 (0.60)***	0.22	small
Medicine (n=159)	.97	.98	5.13 (0.86)	5.24 (0.95)	0.11 (0.56)**	0.12	very small
Nursing (n=82)	.95	.96	4.85 (0.77)	5.10 (0.83)	0.25 (0.52)***	0.31	small
Occupational therapy & physical therapy (n=75)	.95	.95	5.20 (0.68)	5.53 (0.58)	0.33 (0.50)***	0.52	medium
Pharmacy (n=79)	.95	.96	4.82 (0.81)	5.09 (0.87)	0.26 (0.55)***	0.31	small
Public health (n=101)	.95	.95	5.24 (0.61)	5.45 (0.58)	0.22 (0.40)***	0.36	small
Social work (n=49)	.97	.97	5.11 (0.92)	5.41 (0.93)	0.30 (0.50)***	0.33	small
SEE - Acceptance of cultural differences[c,d]	.97	.98	5.71 (0.72)	5.76 (0.72)	0.05 (0.39)**	0.07	very small
Audiology & speech and language pathology (n=48)	.97	.92	5.94 (0.23)	5.97 (0.15)	0.03 (0.17)	0.17	very small
Dental medicine (n=107)	.97	.99	5.52 (0.86)	5.57 (0.96)	0.05 (0.41)	0.06	very small
Medicine (n=159)	.98	.96	5.61 (0.94)	5.67 (0.84)	0.07 (0.51)*	0.07	very small
Nursing (n=82)	.98	.99	5.70 (0.74)	5.71 (0.84)	0.01 (0.49)	0.01	very small
Occupational therapy & physical therapy (n=75)	.85	.64	5.90 (0.28)	5.95 (0.20)	0.06 (0.21)	0.23	small
Pharmacy (n=79)	.95	.97	5.66 (0.68)	5.78 (0.55)	0.12 (0.38)**	0.20	small
Public health (n=101)	.98	.99	5.84 (0.45)	5.82 (0.64)	-0.02 (0.24)	0.04	very small
Social work (n=49)	.95	.97	5.75 (0.61)	5.83 (0.49)	0.08 (0.36)	0.14	very small

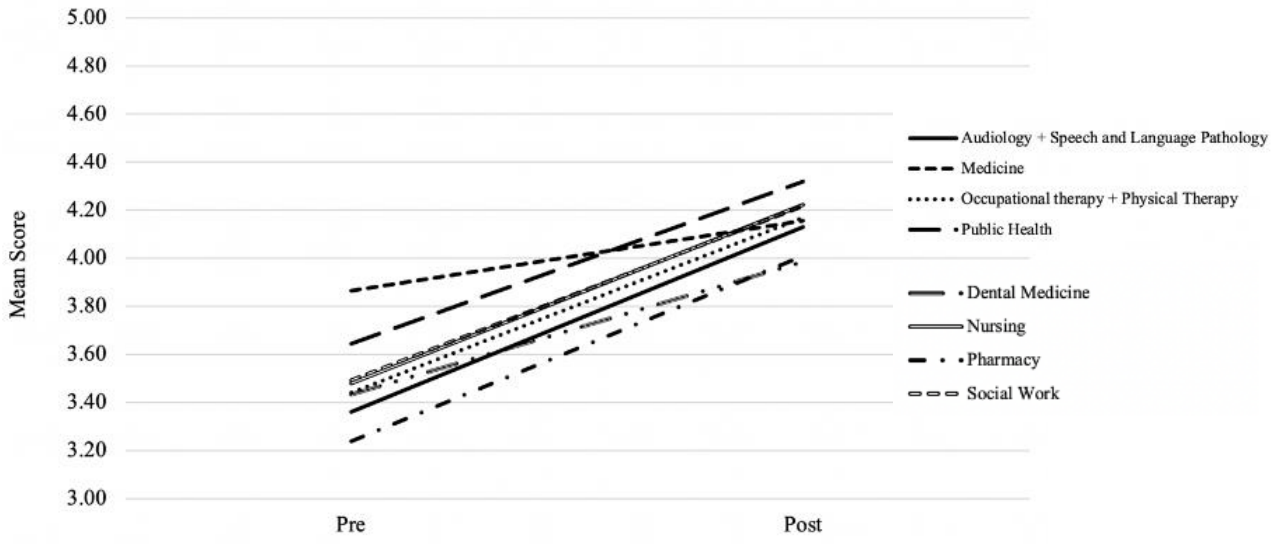
* $p < .05$; ** $p < .01$; *** $p < .001$

[a] Bonferroni-adjusted paired sample t-test was used to determine significance. Statistically significant results are denoted with *

[b] Cohen's $d < 0.2$ is considered a very small effect size; d between 0.2 and 0.5 is considered small, d between 0.5 and 0.8 is considered medium, and $d > 0.8$ is considered large

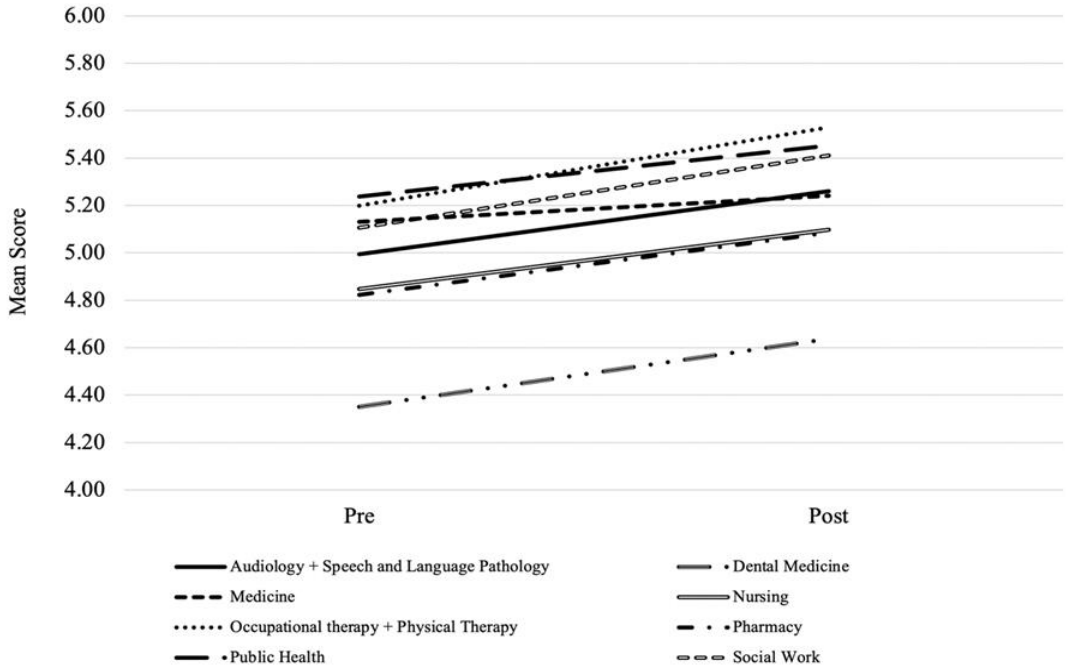
[c] Items of SEE - Acceptance of Cultural Differences subscale was reversely coded for analysis

[d] The range of means is 1-5 for the ICCAS scale, where 1=poor, 2=fair, 3=good, 4=very good, 5=excellent; and 1-6 for SEE subscales, where 1=strongly disagree that it describes me, 2=disagree that this describes me, 3=somewhat disagree that this describes me, 4=somewhat agree that this describes me, 5=agree that this describes me, 6=strongly agree that this describes me



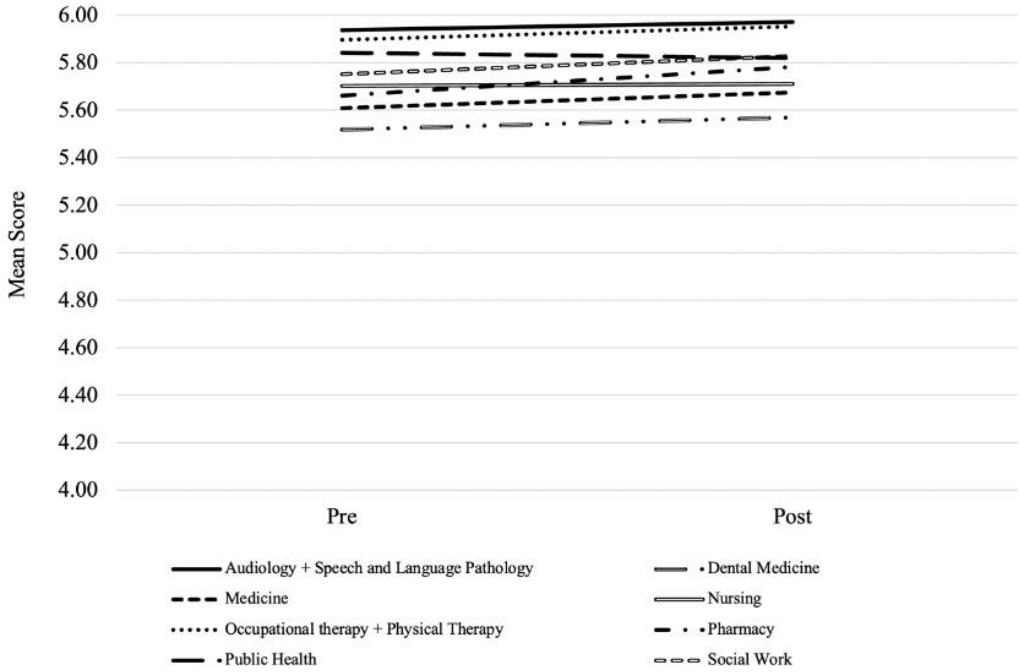
Mean scores at pre- and post-experience are plotted for each profession. The x-axis represents the pre- and post-experience time points and the y-axis represents mean score on the Interprofessional Collaborative Competency Attainment Revised (ICCAS-R) instrument.

Figure 1: Changes in mean ICCAS-R scores across professions



Mean scores at pre- and post-experience are plotted for each profession. The x-axis represents the pre- and post-experience time points, and the y-axis represents mean score on the Empathic Awareness Subscale of the Scale of Ethnocultural Empathy (SEE) Instrument.

Figure 2: Changes in mean empathic awareness subscale scores between professions



Mean scores at pre- and post-experience are plotted for each profession. The x-axis represents the pre- and post-experience time points, and the y-axis represents mean score on the Empathic Awareness Subscale of the Scale of Ethnocultural Empathy (SEE) Instrument

Figure 3: Changes in mean acceptance of cultural differences subscale scores between professions

The repeated measures ANOVA, taking programmes as predictors, was statistically significant (F = 5.04, $p < .001$) for the ICCAS-R scale. A statistically significant increase was observed in each programme. The effect

size was small for students in the medicine programme, medium for those in dental medicine, and large for all other programmes. It should be noted that the pre-ICCAS-R mean was the highest for the medicine programme (M = 3.87, SD = 0.78).

The repeated measures ANOVA, taking programmes as predictors, was statistically significant (F = 10.46, $p < .001$) for the SEE empathic awareness subscale. A statistically significant increase was observed in each programme. The effect size was generally small for the programmes, except for medicine (negligible effect) and physical and occupational therapy (medium effect).

The repeated measures ANOVA, taking programmes as predictors, was statistically significant (F = 3.53, $p = .001$) for the SEE acceptance of cultural differences subscale. A statistically significant increase was observed in medicine and pharmacy students only. Students in the medicine programme had a very small effect, and those in the pharmacy programme had a small effect.

Discussion

This quantitative study sought to measure the impact of a large-scale interprofessional forum, involving asynchronous pre-work and live online small-group discussions, on students' ethnocultural empathy and interprofessional competencies. The results support that this activity could increase self-assessed interprofessional competencies and empathic awareness.

The target audience for this educational programme consisted of students in health profession programmes with some degree of professional identity and clinical exposure (i.e., not first-year students). Research examining changes in ethnocultural empathy scores among first-year nursing students following a workshop aimed at improving participants' understanding of other racial groups has shown a significant increase from post-intervention (Fleming *et al.,* 2015). Similar changes were observed among undergraduate nursing students following remote training on cultural sensitivity (Butte & Hristova, 2024) and simulation (Lalande, 2024). The present findings add to these data by reporting on changes in ethnocultural empathy in a larger, diverse cohort of interprofessional students. Additionally, students in this cohort were beyond the first year of their training programmes, providing insights into the impact in an interprofessional activity on students with prior experience of interprofessional education or collaborative practice.

A study among a large cohort of health profession students (medicine, psychology, nursing, and social work) at the beginning and end of a four-year master's programme in health care showed differences between professions, with psychology students exhibiting significantly higher empathic skills. However, few differences were observed in early versus later semesters (Rasoal *et al.,* 2009). Similarly, differences in ethnocultural empathy were identified in a cohort of first-year physician assistant students; these differences were influenced by age, gender identity, and ethnic groups (Domenech Rodriguez *et al.,* 2019). These data are critical to understanding that baseline differences may exist between professions and students within the same profession. In the current study, a significant increase was observed in empathic awareness among all students, with negligible differences in the magnitude in some programmes (physical and occupational therapy). However, while students' acceptance of cultural differences varied significantly for the entire cohort, subgroup analyses revealed a significant difference in medicine and pharmacy students only. Mean pre-experience scores for this subscale were >5.5 out of 6 for all subgroups, indicating that students had very high levels of agreement in their acceptance of cultural differences at baseline. Therefore, although a significant difference was observed from pre- to post-experience for all students, this construct may be developed in students of health professions programmes, and future interprofessional education should target different areas, such as empathic awareness.

Data from the current study are further distinguished from previous studies as an evaluation of interprofessional competencies was included using the ICCAS-R. As described, it was essential to understand the impact of this interprofessional forum on the larger picture of interprofessional competencies, along with ethnocultural empathy. The findings show a significant increase in interprofessional competencies for all professions, consistent with data from other interprofessional education activities involving learners of similar experience levels at this institution (Fusco *et al.,* 2019; Fusco & Ohtake, 2022).

The IPEC core competencies highlight the need for cultural humility in interprofessional collaborative practice; therefore, it may be of interest to health profession educators to understand what educational interventions could help develop this competency (Interprofessional Education Collaborative, 2023). The present study included a large, diverse set of health profession students, which may reach a broader

audience of health profession educators. The study procedures also included two validated instruments to measure interprofessional competencies, i.e., ICCAS-R and two of the four subscales of SEE (the remaining two were irrelevant to the educational programme). The post-programme survey was administered immediately after the intervention, and questions remain about whether the programme's impact on interprofessional competencies and ethnocultural empathy will persist. While the researchers observed a significant increase in empathic awareness and acceptance of cultural differences for the entire cohort, the mean pre-experience scores were 4.95 and 5.71, respectively. At baseline, students reported high levels of agreement with these subscales. Students' prior experiences may impact these scores. Although the cohort of students in this study was large and diverse, prior experience was variable. Future research should explore this educational programme in groups of learners with similar experiences or those earlier in their training programmes.

Conclusion

A large-scale interprofessional education activity involving asynchronous pre-work and live, small-group discussions can lead to an increase in self-assessed interprofessional competencies and empathic awareness in a group of students from various health profession training programmes. Educators aiming to improve interprofessional competencies and empathic awareness could consider adopting a similar approach.

Ethics approval

The study was reviewed and determined to be exempt by the University at Buffalo Institutional Review Board (STUDY00001280).

Conflict of interest

The authors declare no conflict of interest.

Source of funding

The authors did not receive any funding.

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Appendix A: Additional case information

Fred Santiago is a 69 year old male who lives in Buffalo but is originally from Puerto Rico. He is a retired machinist and lives in a two story home with his wife who is also retired. His chronic medical conditions include type II diabetes (requiring insulin) with peripheral neuropathy, chronic obstructive pulmonary disease (COPD), coronary artery disease, cerebral vascular disease, hypertension, arthritis, and obesity. He has a poor fitting maxillary denture, an abscessed mandibular molar, numerous missing teeth and poor oral hygiene. Members of his extended family have experienced similar health issues.

For dinner, his wife does all the cooking and they rarely eat out. She will use boxed meals like Hamburger Helper about half the time and make meals such as pulled pork or beef with rice.

Fred had a stroke 2 years ago and no longer drives. His wife does not have a driver's license.

Fred weighs 235 lbs, his height is 5'10", and his BMI is 33.7 kg/m^2. His recent blood work showed his HgbA1C was 9.6% (goal for diabetics is 7.0 or below). His LDL cholesterol was 167 mg/dL (goal for diabetics with heart disease is 70 or below). His BP is 142/88 mmHg.

Fred's medications include:

Medication	Directions	Indication
Fluticasone 250 mcg/salmeterol 50 mcg	1 inhalation twice daily	COPD
Albuterol 90 mcg	2 inhalations every 4 to 6 hours as needed for shortness of breath	COPD
Metformin 1000 mg	1 tablet by mouth twice daily	Diabetes
Sitagliptin 100 mg	1 tablet by mouth once daily	Diabetes
Lantus (glargine insulin)	20 units sq every evening	Diabetes
Ibuprofen 600 mg	1 tablet by mouth three times daily	Arthritis
Lisinopril 40 mg	1 tablet by mouth once daily	Hypertension
Rosuvastatin 20 mg	1 tablet by mouth once daily	Hypercholesterolemia
Aspirin 81 mg	1 tablet by mouth once daily	Heart attack and Stroke Prevention

The Santiago's have health insurance through "Original Medicare" (hospital insurance and medical insurance), but are not enrolled in a Part D (drug coverage) plan. Social Security retirement benefits are the couple's only source of income, and they each receive about $1200 a month from Social Security. Part B coverage for physician and ambulatory care has a $134 monthly premium (deducted from his Social Security check) and a 20% co-pay on all inpatient and outpatient physician visits, mental health services, and outpatient therapy, at an average cost of $150/visit.