Check for updates

RESEARCH ARTICLE

Health profession readiness for interprofessional education in the Central Appalachia: a cross-sectional study [version 1; peer review: 2 approved with reservations]

Amanda Blankenship , George Asimellis , Bhargavi Joshi, Briana Rodriguez, Margaret Wright Sidle

Kentucky College of Optometry, University of Pikeville, Pikeville, KY, 41501, USA

V1 First published: 09 Jul 2021, 10:553
<https://doi.org/10.12688/f1000research.52906.1>

Latest published: 09 Jul 2021, 10:553
<https://doi.org/10.12688/f1000research.52906.1>

Abstract

Background: This study on interprofessional relationships took place in Eastern Kentucky analyzing optometry, medical and nursing students at the University of Pikeville. The Readiness for Interprofessional Learning Scale (RIPLS), regarding all three healthcare professional schools, was used to measure and determine students' views on working with one another. The purpose of the study was to examine similarities and differences in student attitudes across the three health professional programs within the same university.

Methods: Second year University of Pikeville (UPIKE) nursing, optometry, and medical students were given survey questions that followed the validated 19-item Readiness for Interprofessional Learning Scale (RIPLS).

Results: While the optometry and medical students demonstrated statistically similar attitudes, key statistical findings included that nursing students were more likely than medical students to believe that clinical problem solving can only be learned effectively with students/professionals from their own school/organization ($p = 0.015$); nursing students were more likely than medical students to welcome the opportunity to work on small group projects with other health and social care students/professionals ($p = 0.018$); and nursing students were more likely than both optometry and medical students to not be sure what their professional role will be/is ($p = 0.005$).

Conclusions: At the UPIKE, there is an observable difference between the attitudes toward IPE. Nursing students appeared to have a more positive attitude toward IPE than medical and optometry students, with the medical and optometry students having similar attitudes.

Keywords

Online questionnaire, interprofessional education, survey, IPEC

Open Peer Review

Approval Status ? ?

	1	2
version 1		
09 Jul 2021	view	view

1. **Takatoshi Makino**, Gunma University, Maebashi, Japan

2. **Joan Groessi** , University of Wisconsin Green Bay, Green Bay, USA

Any reports and responses or comments on the article can be found at the end of the article.

This article is included in the **Sociology of Health** gateway.

Corresponding author: George Asimellis (georgeasimellis@gmail.com)

Author roles: **Blankenship A:** Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Supervision, Validation, Visualization, Writing – Review & Editing; **Asimellis G:** Conceptualization, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing – Review & Editing; **Joshi B:** Data Curation, Methodology, Validation, Writing – Original Draft Preparation, Writing – Review & Editing; **Rodriguez B:** Data Curation, Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Wright Sidle M:** Data Curation, Formal Analysis

Competing interests: No competing interests were disclosed.

Grant information: This work was supported by the University of Pikeville.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Copyright: © 2021 Blankenship A *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Blankenship A, Asimellis G, Joshi B *et al.* **Health profession readiness for interprofessional education in the Central Appalachia: a cross-sectional study [version 1; peer review: 2 approved with reservations]** F1000Research 2021, 10:553 <https://doi.org/10.12688/f1000research.52906.1>

First published: 09 Jul 2021, 10:553 <https://doi.org/10.12688/f1000research.52906.1>

Introduction

Health care has become an integrated environment, consisting of a kaleidoscope of professions, working together for the goal of quality care and improved health care outcomes for patients. The importance of establishing a common structure early in a medical professional student's career is crucial in maintaining the integrity of this type of work environment. Interprofessional education (IPE) prepares health professional students with the skills for collaborating with various health professionals. Curriculum intervention through IPE training has had positive effects on the education of health professionals¹ Optometry students, at least in most of the US Schools, have IPE built into their curriculum during their third year. Medical school and nursing students have the option of joining a seminar to educate themselves further.

During the present time, when the world is facing a shortage of healthcare workers, global leaders in healthcare and policymakers are looking for innovative ideas and ways that can help solve the problem and develop programs to bolster the global health workforce. A key aspect of any solution in sight for solving such personnel and workforce issue is by developing collaboration across the various disciplines in healthcare. At present, patient care is a multidisciplinary approach with various teams focused on providing patient needs and improving quality of life during serious medical conditions. In any healthcare setup and at any given time, teams of doctors, social workers, nurses, and paramedics work in collaboration to provide medical and logistical support to everyone involved in patient care.

The delivery of effective and high-quality patient care tends to be demanding, requiring a good understanding between the team members and is a complex activity. But as seen in various situations, the understanding and collaboration between several healthcare givers can be difficult and problematic. IPE is a way to improve understanding and teamwork. It is not a new concept but has been known for over 50 years and has been endorsed by the World Health Organization for more than 20 years.² IPE is defined as educational experiences in which members or students of two or more professions learn with, from, and about each other to improve collaboration and the quality of care and services. In academics or universities, IPE is realized when students from two or multiple professional fields come together and learn from, about, and with each other collaboratively.³

IPE has the potential to improve health outcomes, could be a powerful tool to help students in professional courses to understand their importance on the team, and to provide them with their professional identity. At the same time, it could help them understand the importance of the roles others play within the healthcare provider's team.⁴

At present, IPE education is extremely single-tracked with emphasis on professional courses and making sure that students learn and understand the importance of one's course in isolation, while completely neglecting the importance and requirement of other professionals. Today, patients have complex health issues and typically require more than one healthcare provider to understand and address the full spectrum of their disease condition and treatment modalities. The delivery of such patient care occurs in compartmentalized silos and with many misunderstandings and significant miscommunication between different team members. With so much history, IPE is still a style of education that has remained obsolete, underutilized, and often misunderstood.

IPE can provide a practical framework for learning and clinical practice. This can help bridge the gap between several individuals by creating an environment where the primary focus is on patient care. Early implementation of IPE is important and may prevent the development of negative interprofessional attitudes.

Our school, the University of Pikeville, is located in central Appalachia, USA. It has the distinction of being the only school across a very large geographical area that has the combination of the three health professional schools that emphasize primary care, namely Osteopathic Medicine, Optometry, and Nursing. No such study has taken place either in the geographical area of our school or in the combination of medical, optometry, and nursing schools. Particularly considering the shift of optometry into primary care ophthalmology, the underlying trends about an interprofessional collaboration among the future health professionals are unknown. The purpose of this study was to assess and analyze the student's perception of interprofessional importance and respect for learners studying various professional courses. Thus, we evaluated how different medical professional school students view the importance and requirement of interprofessional care.

Methods

Setting

The study was designed and implemented at the University of Pikeville (UPIKE), due to the presence of three health professional colleges, the Kentucky College of Optometry (KYCO), the Kentucky College of Osteopathic Medicine (KYCOM), and the Elliot School of Nursing (ESN). UPIKE is unique in the greater Appalachian geographical area and

the Commonwealth of Kentucky for having the combination of these three different professional schools of optometry, medicine and nursing.

Study design

This is a cross-sectional descriptive study that was conducted in the spring of 2019 by using a survey questionnaire which was provided to students over a semester at the three different professional schools.

Participants

The students recruited were all second year students enrolled in optometry, osteopathic, and the nursing programs. There were no other inclusion or exclusion criteria used for the selection of the sample students for this research.

The study was extended to a total of 240 students across the three schools and was administered online via [surveyhero.com](#); a link to the survey was sent to the student's school email address. Due diligence was exercised to prevent any duplication of responses and any responder can fill the form only once by clicking the link provided. The surveys were sent to students with adequate time to respond at baseline with two subsequent weekly reminders.

Data collection

The survey questions were developed based on the KYCO objectives for IPE and included a few open-ended questions and a few questions involving the Likert scale for answering. Such questionnaires are used to explore the use of IPE as a strategy to reform health professional education to become more collaborative.^{5,6}

The survey questions followed the validated 19-item Readiness for Interprofessional Learning Scale (RIPLS).^{7,8} The questions were designed to study the perceptions of students regarding the knowledge and respect about students from other professional courses across various topics. The questions investigated the student's perception about how they feel about interprofessional learning, is teamwork essential, how will clinical problem solving get better with cross-professional collaboration and help them overcome their course limitations. The survey required a maximum of 5 to 10 minutes to complete. A copy of the questionnaire can be found in the *Extended data*.¹³

Data analysis

The statistical software SPSS v 26 was used to analyze the data from the study. The results were expressed as mean and standard deviation and any differences were considered as significant if the p-value for that determinant was greater than 0.05. Analysis of variance was used as the statistical test.

Ethical considerations

The study was approved by the institutional review board (IRB# IRB00009652IRB) of the University of Pikeville. Participation (i.e., responding to the request) was voluntary; completing the questionnaire was taken as consent to participate. The data were collected and processed anonymously, and consent was taken from the students to use their data for analysis.

Results

The survey for this study was administered to 240 students over a semester, of which 103 returned their response. In total, 61% of the total responders were female students with 38% being male students; 1% did not identify gender ([Table 1](#)).

Based on the data analyzed following the survey ([Table 2](#) and [Figure 1](#)), the nursing students were more likely than medical students to believe that clinical problem solving can only be learned effectively with students/professionals from their own school/organization ($p = 0.015$). The nursing students were also more likely than medical students to welcome the opportunity to work on small group projects with other health and social care students/professionals ($p = 0.018$) compared to optometry or osteopathic medical students. Also, the nursing students were more likely than both optometry and medical students to not be sure what their professional role will be/is ($p = 0.005$).

Discussion

The strength of this work is that it is the first study performed in our area attempting to measure the perceptions of IPE among health professional students. The survey measured and compared the attitudes of divergent healthcare professional students. Because IPE is influential to provide patients with the best care, the end goal is to provide knowledge about the attitudes of our professional medical students and to foster more research in this area.

In this study, the optometry and medical students did not demonstrate statistical differences in their attitudes toward IPE, while the nursing students had more positive attitudes. The statistical data supporting that fact could be influenced by the

Table 1. Study respondent population demographics.

	n	%
Gender		
Male	39	38
Female	63	61
Non identifying	1	1
Course		
Optometry	56	54
Medicine	36	35
Nursing	11	11

Table 2. Test sentence answer results mean (standard deviation) across the three scores. The maximum score was 10.

Sentence	Optometry Student	Medical Student	Nursing Student	Total Score	p-value
Communication skills should be learned with other health and social care students/ professionals.	8.3 (1.7)	8.7 (2.1)	9.3 (1.3)	8.6 (1.8)	0.240
Learning with other students/professionals will make me a more effective member of a health and social care team.	7.9 (1.8)	7.8 (2.8)	8.9 (1.4)	8.0 (2.2)	0.306
I am not sure what my professional role will be/is.	1.5 (2.3)	1.6 (2.7)	4.5 (4.4)	1.9 (2.8)	0.003
I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students/ professionals.	7.3 (2.4)	6.9 (2.9)	9.4 (1.0)	7.3 (2.6)	0.023
For small-group learning to work, students/ professionals need to respect and trust each other.	8.6 (1.6)	9.1 (1.9)	9.0 (1.5)	8.9 (1.7)	0.389

circumstance that nurses coordinate with physicians and other healthcare professionals more than the other professions surveyed within this study. It is noteworthy that optometry students and medical students shared similar results, although only the optometry students have IPE classes built into their curriculum. Nurses have diverse, important duties that allow them to work in different healthcare fields, and this, perhaps, explains similar findings in the literature that supports the nursing school program's higher IPE positive attitudes.⁶

Similar studies involving Physician Assistant professional school students⁹ indicated very positive attitudes toward IPE. Interestingly enough, these attitudes appear to decline between matriculation and graduation; such findings have also been reported among undergraduate students as well.⁶ It is important; therefore, that the strengthening of IPE in the health professional school's curricula will serve to make full use of the students' initial positive attitudes and focus on skill development for IPE competencies. A well-placed IPE curriculum, particularly during clinical training, can be associated with greater receptivity toward collaborative care.^{10,11}

We hope that the findings of this study will foster the determination of academic institutions to strengthen IPE in their curricula by instituting formal interprofessional educational activities that involve students across all programs for health professionals. The incorporation of IPE into the core curricula can be implemented at the singular level of each student and within the clinical setting as a whole, relying on faculty activities and coursework and collective activities at the school level exert influence in the health education and practice system.^{3,12} The valuable collaborative learning opportunities will enhance respect for other professionals and insight into the value of IPE in healthcare delivery.

Figure 1. Bar chart with sample answers comparing the three groups of students (data per Table 2).

Conclusion

This study revealed that, at UPIKE, nursing students had the best attitudes toward IPE compared to optometry and medical students. Nursing students also differed in their attitudes about clinical education involving interprofessional education techniques compared to optometry and medical school professional students.

This study showed that there is room for improvement for all UPIKE healthcare professional students. Because the data showed a discrepancy between professional students, another study discerning if the IPE course taught within the schools could have influenced this phenomenon will be conducted over the next couple of years at UPIKE.

Data availability

Underlying data

DANS: Interprofessional study questionnaire data, <https://doi.org/10.17026/dans-xe2-tufn>.¹³

Extended data

DANS: Interprofessional study questionnaire data, <https://doi.org/10.17026/dans-xe2-tufn>.¹³

This project contains the following extended data:

- IPE study questions

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

References

1. Wang Z, Feng F, Gao S, et al.: **A Systematic Meta-Analysis of the Effect of Interprofessional Education on Health Professions Students' Attitudes.** *J Dent Educ.* 2019 Dec; **83**(12): 1361–1369. [PubMed Abstract](#) | [Publisher Full Text](#)

2. World Health Organization: **Framework for action on interprofessional education and collaborative practice**. World Health Organization; 2010.
[Reference Source](#)
3. González-Pascual JL, Icaran E, Saiz-Navarro EM, *et al.*: **Impact of the first interprofessional education undergraduate program in Spain**. *J Interprof Care*. 2018 May 4; **32**(3): 374–377.
[PubMed Abstract](#) | [Publisher Full Text](#)
4. Méndez MJ, Armayor NC, Navarraz MT, *et al.*: **The potential advantages and disadvantages of introducing interprofessional education into the healthcare curricula in Spain**. *Nurse Educ Today*. 2008 Apr 1; **28**(3): 327–336. Epub 2007 Sep 18.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. Dow AW, DiazGranados D, Mazmanian PE, *et al.*: **An exploratory study of an assessment tool derived from the competencies of the interprofessional education collaborative**. *J Interprof Care*. 2014 Jul 1; **28**(4): 299–304.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
6. Coster S, Norman I, Murrells T, *et al.*: **Interprofessional attitudes amongst undergraduate students in the health professions: a longitudinal questionnaire survey**. *Int J Nurs Stud*. 2008 Nov; **45**(11): 1667–1681.
[PubMed Abstract](#) | [Publisher Full Text](#)
7. McFadyen AK, Webster VS, Maclaren WM: **The test-retest reliability of a revised version of the Readiness for Interprofessional Learning Scale (RIPLS)**. *J Interprof Care*. 2006 Dec; **20**(6): 633–639.
[PubMed Abstract](#) | [Publisher Full Text](#)
8. da Costa MV, Vilar MJ, de Azevedo GD, *et al.*: **Interprofessional education as an approach for reforming health professions education in Brazil: emerging findings**. *J Interprof Care*. 2014 Jul; **28**(4): 379–80.
[PubMed Abstract](#) | [Publisher Full Text](#)
9. Loherty K, Lie D, Fung CC, *et al.*: **Interprofessional Education: What Measurable Learning Outcomes Are Realistic for the Physician Assistant Profession?** *J Physician Assist Educ*. 2016 Jun; **27**(2): 63–67.
[PubMed Abstract](#) | [Publisher Full Text](#)
10. Pinto A, Lee S, Lombardo S, *et al.*: **The impact of structured interprofessional education on health care professional students' perceptions of collaboration in a clinical setting**. *Physiother Can*. Spring 2012; **64**(2): 145–156.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
11. Wellmon R, Gilin B, Knauss L, *et al.*: **Changes in student attitudes toward interprofessional learning and collaboration arising from a case-based educational experience**. *J Allied Health*. Spring 2012; **41**(1): 26–34.
[PubMed Abstract](#)
12. Ho K, Jarvis-Selinger S, Borduas F, *et al.*: **Making interprofessional education work: the strategic roles of the academy**. *Acad Med*. 2008 Oct 1; **83**(10): 934–940.
[PubMed Abstract](#) | [Publisher Full Text](#)
13. Asimellis G (University of Pikeville, Kentucky College of Optometry): **Interprofessional Study Questionnaire Data**. *DANS*. 2021.
[Publisher Full Text](#)

Open Peer Review

Current Peer Review Status: ? ?

Version 1

Reviewer Report 07 November 2022

<https://doi.org/10.5256/f1000research.56237.r153147>

© 2022 Groessl J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Joan Groessl

Social Work Professional Programs, University of Wisconsin Green Bay, Green Bay, WI, USA

In reviewing the article, it was unclear if this was meant to be a research brief or a thorough analysis of the results. The only data I was able to access was a bar chart of several of the questions. There was no evidence of the stated ANOVA or results with significance level. Having done research myself with this tool, the statistical strategies would seem appropriate, at least for the RIPLS portion. [This is why I put "not applicable" for the statement below related to the statistical analysis being appropriate.]

The conclusions outlined in the article were inconsistent with what appeared on the included Table. In both the abstract summary of the results and the results section, the authors note that "*nursing students were more likely than medical students to believe that clinical problem solving can only be learned effectively with students/professionals from their own school/organization*". The remainder of the sentence in the abstract (after the semi-colon) appears contrary to that statement and to findings of other research on the topic. In the table enclosed in the article, nursing students scored more positively on each dimension of the few prompts reported.

When discussing data collection, it would be helpful to know what questions were created to "*explore the use of IPE as a strategy to reform health professional education to become more collaborative*". [What kinds of questions would lead to determine this?] The statement would seem to be a conclusion rather than a focus of questions for student respondents. The article fails to address the results of these in the narrative.

In two areas of the introduction, this reviewer wonders if a different word might make the meaning of the declaration clearer. I underlined the word in question.

- "*At present, IPE education is extremely single-tracked with emphasis on professional courses and making sure that students learn and understand the importance of one's course in isolation*"
 - Emphasis is on professional skills/development, not the course per se.
- "*the underlying trends about an interprofessional collaboration among the future health professionals are unknown*"

- The authors are discussing a shift in one focus but linkage to the selected portion is unclear.
- Are the authors discussing attitudes? Response to IPE?

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

No

Are the conclusions drawn adequately supported by the results?

No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Interprofessional Education, Problem based learning, Scholarship of Teaching and Learning, Ethics.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 25 May 2022

<https://doi.org/10.5256/f1000research.56237.r136322>

© 2022 Makino T. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Takatoshi Makino

Associate Professor of Graduate School of Health Sciences, Responsible Person for Research of WHO Collaborative Centre for Research and Training on Interprofessional Education, Gunma University, Maebashi, Japan

Summary

The purpose of this study was to assess and analyze the student's perception of interprofessional importance and respect for learners studying various professional courses. As a result, nursing students were more likely than medical students in items 12, 14, and 18.

General comment

It is interesting the results found using the Readiness for Interprofessional Learning Scale (RIPLS) for undergraduate students. However, before accepting for indexing the authors should address the following points which are fundamental.

Specific comments

1. It should be integrated by either typing in "0" for all amount of statistics or typing in "0" for the amount of statistics that exceed "1" according to APA style. I recommend typing in "0" for all amount of statistics including Abstract. Because previous studies in this journal typed in "0" for all amount of statistics.
2. I'm confused about the purpose of your article. Because you wrote different purposes in Abstract and Introduction. Please write the same purpose of your article in both the Abstract and Introduction.
3. You set up the purpose to assess and analyze the student's perception of interprofessional importance, and to use RIPLS according to McFadyen (2006)¹. Please describe the effect of IPE used by RIPLS for undergraduate students in the Introduction to explain the association between the purpose of your article and the scale.
4. You didn't write the significance of the study in the Introduction. Please describe the significance of the study in the Introduction to explicitly understand the discussion points in the Discussion.
5. You state it was conducted in the spring of 2019. Please explicitly state the month in the Study design.
6. You didn't write the number of recruited students. Please explicitly describe the number of recruited students for each department in the Participants
7. You didn't write your IPE program as an intervention. Please describe the detail of the IPE program at your university. For example, the purpose, behavioral goal, students who take the course, contents, term, and credit (mandatory, select, transfer system) in Methods to understand the influencing factors in your article.
8. I am confused about the results in your article. Because you wrote a few open-ended questions, few questions, and RIPLS as the survey question in Data collection. However, I couldn't confirm all results for a few open-ended questions, a few questions, and RIPLS in Results. Please describe all survey questions in Data collection to understand the results related to the purpose of your survey.
9. Please describe in more detail the RIPLS in Data collection to understand evaluation content, likert, and score of analysis.

10. Please describe more specifically what data you used and how you analyzed it. In particular, please describe how you analyzed data to make Table 2.
11. You made Table 2 and Figure 1 in this article. However, I think it is the same data in Table 2 and Figure 1. Please select either one.
12. You made Table 2 for only 5 items. However, you should describe all 19 items in Table 2 to understand the influencing factor.
13. You wrote the response rate and the result of data analysis for only items 12, 14, and 18 in Results. However, you should describe all data analysis for all results for a few open-ended questions, a few questions, and RIPLS in Results to understand the influencing factor related to the purpose of your survey.
14. Please describe the discussion for the results which relate to the purpose of your survey in the Discussion to understand the significance of the study in the Introduction.

References

1. McFadyen AK, Webster VS, Maclaren WM: The test-retest reliability of a revised version of the Readiness for Interprofessional Learning Scale (RIPLS). *J Interprof Care*. 2006; **20** (6): 633-9 [PubMed Abstract](#) | [Publisher Full Text](#)

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

No

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research