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References with DOI

1. CAIPE. Interprofessional education- the definition [Internet]. [cited 2016 Nov 28]. Available from: http://caipe.org.uk/resources/defining-ipe/

2. ACPE. Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. 2016 [Internet]. [cited 2016 Nov 29]. Available from: https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf

3. LCME. A best evidence systematic review of interprofessional education: BEME Guide no. 9. Med Teach [Internet]. 2007;29(8):735–51. Available from: http://umsc.org.uic.edu/documents/LCME_standards.pdf https://doi.org/10.1080/01421590701682576

4. Hammick M, Freeth D, Koppel I, Reeves S, Barr H. A best evidence systematic review of interprofessional education: BEME Guide no. 9. Med Teach.2007;29(8):735-751. https://doi.org/10.1080/01421590701682576

5. Lumague M, Morgan A, Mak D et al. Interprofessional education: the student perspective. J interprofessional care. 2006;20(3):246–53. https://doi.org/10.1080/13561820600717891

6. Centers For Medicare & Medicaid Services. CAHPS survey for accountable care organizations Participating in Medicare Initiatives. [Internet]. [cited 2016 Nov 29]. Available from: acocahps.cms.gov

7. Marshall Medical Outreach. No Title [Internet]. [cited 2016 Nov 29]. Available from: https://jcesom.marshall.edu/students/student-organizations/marshall-medical-outreach

8. Marshall Physician receives national distinction for multiple sclerosis care. [Internet]. [cited 2016 Nov 29]. Available from: https://jcesom.marshall.edu/news/musom-news/marshall-physician-receivesnational-distinction-for-multiple-sclerosis-care

9. WV-GRIT [Internet]. [cited 2016 Nov 29]. Available from: https://sole.hsc.wvu.edu/Apps/News/Files/beafdfb1-da96-4689-b0a2-eb9f3840f6f8/GRIT Brochure 2015.pdf

10. Lash DB, Barnett MJ, Parekh N, Shieh A, Louie MC, Tang TT. Perceived benefits and challenges of interprofessional education based on a multidisciplinary faculty member survey. Am J Pharm Educ. 2014;78(10):180. https://doi.org/10.5688/ajpe7810180

11. Ho K, Jarvis-Selinger S, Borduas F et al. Making interprofessional education work: the strategic roles of the academy. Acad Med J Assoc Am Med Coll. 2008;83(10):934–40. https://doi.org/10.1097/acm.0b013e3181850a75

12. Olson R, Bialocerkowski A. Interprofessional education in allied health: a systematic review. Med Educ. 2014;48(3):236–46. https://doi.org/10.1111/medu.12290

13. Milburn PC, Hazel C. Professional knowledge and interprofessional practice. Radiography. 2008;14(4):318–22. https://doi.org/10.1016/j.radi.2007.09.003

14. The Interprofessional Education Collaborative. Core Competencies for Interprofessional Collaborative Practice [Internet]. [cited 2016 Nov 28]. Available from: http://www.aacn.nche.edu/educationresources/ipecreport.pdf

15. Dominguez DG, Fike DS, MacLaughlin EJ, Zorek JA. A comparison of the validity of two instruments assessing health professional student perceptions of interprofessional education and practice. J interprofessional care. 2015;29(2):144–9. https://doi.org/10.3109/13561820.2014.947360

16. Zorek JA, MacLaughlin EJ, Fike DS, MacLaughlin AA, Samiuddin M, Young RB. Measuring changes in perception using the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education (SPICE) instrument. BMC Med Educ. 2014;14:101. https://doi.org/10.1186/1472-6920-14-101

17. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: effects on professional practice and healthcare outcomes. Cochrane database Syst Rev. 2013;3(d002213). https://doi.org/10.1002/14651858.cd002213.pub3

18. Gilligan C, Outram S, Levett-Jones T. Recommendations from recent graduates in medicine, nursing and pharmacy on improving interprofessional education in university programs: a qualitative study. BMC Med Educ. 2014;14(1):14–52. https://doi.org/10.1186/1472-6920-14-52

19. One Health Initiave. About the One Health Initiative [Internet]. [cited 2016 Dec 29]. Available from: http://www.onehealthinitiative.com/about.php

20. Zeirler B. Interprofessional Education and the Affordable Care Act. Clin Sch Rev. 2014;7:96–7. https://doi.org/10.1891/1939-2095.7.2.96

21. IPEC. Core Competencies for interprofessional Collaborative Practice: 2016 update. [Internet]. [cited 2016 Dec 29]. Available from: https://ipecollaborative.org/uploads/IPEC-2016-Updated-CoreCompetencies-Report__final_release_.PDF.

22. WHO. Health education: theoretical concepts, effective strategies and core competencies. [Internet]. [cited 2016 Dec 29]. Available from: http://applications.emro.who.int/dsaf/EMRPUB_2012_EN_1362.pdf.

23. Centers For Medicare & Medicaid Services. MACRA - Delivery System Reform, Medicare Payment Reform [Internet]. [cited 2016 Dec 29]. Available from: https://www.cms.gov/Medicare/QualityInitiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-andAPMs/MACRA-MIPS-and-APMs.html

24. NACNEP. Incorporating Interprofessional Education and Practice into Nursing. Thirteenth Report to the Secretary of the Department of Health and Human Services and the United States Congress. [Internet]. [cited 2016 Dec 29]. Available from: https://www.hrsa.gov/advisorycommittees/bhpradvisory/nacnep/Reports/thirteenthreport.pdf

25. Leichliter M. . Creating Opportunities for Peer Leadership in Honors Education. (2013). Honors in Practice-Online Archive Paper 225 [Internet]. [cited 2016 Dec 29]. Available from: http://digitalcommons.unl.edu/nchchip/225/

26. Brandt B, Lutfiyya MN, King JA, Chioreso C. A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim. J interprofessional care. 2014;28(5):393–9. https://doi.org/10.3109/13561820.2014.906391

The development of a novel interprofessional education curriculum for third year medical and pharmacy students

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Abstract

Introduction:

The Liaison Committee on Medical Education and the Accreditation Council for Pharmacy Education, agencies responsible for the accreditation of medical and pharmacy schools respectively, require interprofessional education (IPE) to be integrated into both curricula. Institutions are given the autonomy to design and implement this requirement; research, however, is equivocal in regard to when and how best to implement IPE. The development of a new IPE curriculum is often met with a number of challenges, such as a lack of faculty support and resources.

Methods:

This study describes a newly created pilot IPE curriculum developed with minimal existing organizational IPE structure and resources, led by faculty champions from two complementary healthcare professions, Internal Medicine and Pharmacy. The validated 10-item Student Perceptions of Interprofessional Clinical Education- Revised (SPICE-R) instrument was used to assess the medical and pharmacy students' attitudes towards interprofessional healthcare teams and the team approach to patient care.

Results:

Overall, students demonstrated a statistically significant increase in their perception of interprofessional healthcare teams and team approach to patient care.

Conclusion:

Prior to this IPE curriculum, no formal IPE curriculum existed in this setting. This IPE curriculum was successfully implemented with minimal existing resources, the use of faculty champions and student's perception of IPE improved using the validated SPICE-R instrument. IPE curriculum integration at our institution is in various stages of development. As IPE integration moves forward this pilot can serve as one example of how IPE could be implemented.

Keywords

Interprofessional Education, curriculum development, faculty champions, complementary professions

Introduction

Interprofessional education (IPE), defined as occurring "when two or more professions learn with, from, and about each other to improve collaboration and quality of care", has gained momentum in health professional education curricula recently.[1] The Liaison Committee on Medical Education (LCME) and the Accreditation Council for Pharmacy Education (ACPE), agencies responsible for the accreditation of medical and pharmacy schools respectively, now

require IPE to be integrated into the students' education.[2,3] The actual requirement set forth by the LCME states that the medical school must "ensure that the core curriculum of the medical education program prepares medical students to function collaboratively on health care teams that include health professionals from other disciplines".[3] Multiple studies have shown that students have a positive reception to many different types of IPE training programs,[4,5] and institutions are given the autonomy to implement this requirement into their individual curricula as they see fit. However, IPE research is equivocal in regard to when and how to best implement it.

Additionally, the Center for Medicare and Medicaid Services (CMS) is incentivizing providers to work together to meet certain benchmarks in the delivery of patient care.[6] This is becoming a standard practice in the healthcare field and providers need skills to meet these demands and remain successful. IPE is key to the training of future healthcare professionals as they enter rapidly evolving, patient-centered medical professions with a new emphasis on teamwork and care coordination.

Opportunities to create formal interprofessional education and collaborative practice curricula exist naturally in many settings. Examples at our institution include the Marshall Medical Outreach (MMO) which is a medical student-led free mobile health clinic that provides medical care to the homeless,[7] our nationally recognized multidisciplinary care in multiple sclerosis,[8] and GRIT (Geriatric Retreat/Immersion Training) annual conference, which is a geriatric education program based on Boston University's successful CRIT (Chief Residents Immersion Training)[9]. However, there are many described barriers to implementing structured IPE programs for trainees. Scheduling conflicts between the programs and a lack of support resources are two of the most cited challenges.[10] Faculty "champions" of IPE seem to be essential to the initial stages of implementation,[11] but may not be immediately identifiable. Programs often lack monetary resources throughout the entire curriculum development process, and this may limit their success. There also may be a lack of clinical faculty participation early on, as well as differences in the preferred educational delivery methods.

Fortunately, individualization of curricula made possible by participation of faculty champions may prove unexpectedly beneficial.[12] Milburn and Colyer stipulate that there is no standard IPE curriculum design and that faculty champions must be employed in order to successfully fulfill this LCME and ACPE requirement.[13] They suggest that interprofessional practice would be most successful when complementary professions, with overlapping clinical responsibilities, collaborate together.[13] Our institution's IPE was initiated with these principles in mind, and the purpose of this study is to 1) describe our newly created pilot IPE curriculum developed with minimal existing organizational IPE structure and resources, led by faculty champions from two complementary professions (Internal Medicine and Pharmacy) and 2) evaluate students' perceptions of the IPE education experience.

Materials and Methods

This pilot curriculum study was a collaborative effort between the Joan C. Edwards School of Medicine (JCESOM) and the Department of Internal Medicine and School of Pharmacy (MUSOP) at Marshall University. The Institutional Review Board at Marshall University

approved the study protocol. The IPE development team consisted of the MUSOP Dean, MUSOP Assistant Dean of experiential learning, Internal Medicine clerkship director and an Associate Professor of Medicine from JCESOM. Faculty champions were identified early during the curriculum planning phase. This IPE curriculum was designed for implementation into any existing clinical curricula.

The pilot curriculum targeted third year medical students on their Internal Medicine clinical rotation and third year pharmacy students on their clinical experiential rotation. Prior to the implementation of this curriculum, no formal IPE of this type existed for our medical and pharmacy students in their clinical years. The duration of this pilot curriculum was from July 1, 2014 through June 30, 2015. Students attended between two and four sessions throughout their respective rotations. The sessions were held approximately twice a month on Friday afternoons, and lasted approximately 1.5-2 hours. Each session was designed to focus on an IPE topic in the

Table 1. Pre- and Post SPICE-R Survey Item Averages and Standard Deviations.

Survey item	**Pre-SPICE-R survey item average**	**Std. Dev.**	**Post- SPICE-R survey item average**	**Std. Dev.**
Working with another discipline of students enhances my education	4.51	.599	4.73	.511
My role within the interdisciplinary team is clearly defined	4.32	.703	4.66	.523
Health outcomes are improved when patients are treated by a team of professionals from different disciplines	4.64	.569	4.76	.434
Patient satisfaction is improved when patients are treated by a team of professionals from different disciplines	4.45	.658	4.65	.587
Participating in educational experiences with another discipline of students enhances my future ability to work on an interdisciplinary team	4.48	.635	4.64	.671
All health professional students should be educated to establish collaborative relationships with members from other disciplines	4.57	.600	4.74	.522
I understand the roles of other professionals within the interdisciplinary team	4.25	.772	4.60	.683
Clinical rotations are the ideal place within their respective curricula for medical and pharmacy students to interact	4.41	.688	4.63	.618
Physicians and pharmacists should collaborate in teams	4.66	.588	4.78	.485

During their education, medical and pharmacy students should be involved in teamwork in order to understand their respective roles	4.52	.611	4.72	.523

literature in which the two specialties intersected significantly, specifically: 1) transitions of care (TOC), 2) ethics (ETHICS), 3) best practices of medication reconciliation and history (BPMH), and 4) a practice-based learning session on anticoagulation (AC). Objectives followed the Interprofessional Education Collaborative (IPEC) Core Competencies for Interprofessional Collaborative Practice.[14]

For all sessions, students met in small groups of both pharmacy and medical students. Each IPE session began with a 20-minute didactic lecture to introduce the topic. This was followed by a 20-minute small group activity where case-based scenarios and questions were given for each group to work through and discuss. The cases and answers were discussed in a combined large group setting for about 30-40 minutes. Faculty champions from Pharmacy and Internal Medicine served as facilitators during all stages of the session. A minimum of one faculty champion from Pharmacy and Internal Medicine were present at each session. Important concepts were briefly summarized at the end of each session. See appendix for a complete example of one of our IPE sessions (the TOC session).

To determine the impact of IPE, the 10-item Student Perceptions of Interprofessional Clinical Education- Revised (SPICE-R) instrument was completed at the beginning and end of each IPE session (Table 1). This is a validated measurement to evaluate IPE curricula among medical and pharmacy students. Responses are captured via a five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).[15] The SPICE-R Instrument evaluates three factors of interprofessional education: interprofessional teamwork and team based practice (items 1, 5, 6, & 8-10), roles/responsibilities for collaborative practice (items 2 & 7), and patient outcomes from collaborative practice (items 3 & 4).[16] The SPICE-R score is the sum of the ten responses. The minimum SPICE-R score possible is 10 and maximum SPICE-R score possible is 50. Student completion of the SPICE-R instrument was voluntary. The exact number of surveys handed out is not known and therefore a response rate is unable to be calculated.

Statistics

Data analyses for the SPICE-R scores were calculated using SPSS Version 23.0. All of the collected pre- and post-SPICE-R scores were used for statistical analysis. Total average SPICE-R score was the outcome variable. Independent T-test assuming unequal variance was used to compare the mean pre- and post- SPICE-R score for all sessions. A p-value of <0.05 was considered significant.

Results

The total number of participants who completed the pre- and post- SPICE-R surveys per session is reported in Table 2. Numbers of participants varied between sessions due to an inconsistent number of students on both the medical and pharmacy rotations as well as differing lengths of

rotation. Differences in number of participants completing the Pre vs Post SPICE-R surveys are attributed to student tardiness or failure to complete both surveys administered per session.

Table 2. Number of participants completing the pre and post SPICE-R survey

SESSIONS	Number of PRE-SPICE-R instruments completed	Number of POST-SPICE-R instruments completed
TOC	106	109
ETHICS	75	75
BPMH	49	43
AC	31	31

SPICE-R Results

The independent t-test results comparing mean pre -and post-SPICE-R instrument scores for all sessions are reported in Table 3. The TOC, ETHICS and AC sessions all showed a statistically significant difference in the SPICE-R instrument scores. For these sessions, students' perceptions of IPE before and after the attended sessions were shown to have improved. Only the BPMH session failed to show a statistically significant increase.

Table 3. Independent Sample T-test Assuming Unequal Variances Comparing Mean Pre- and Post-SPICE-R Scores.

Session	Pre-SPICE-R mean score	Post-SPICE-R mean score	p-value*
TOC	44.62	46.61	.001
ETHICS	45.52	46.49	.015
BPMH	45.55	46.79	.256
AC	45.03	49.03	.001

*p-value considered significant at <0.05

Discussion

A small team of faculty champions designed and implemented a new IPE experience for medical and pharmacy students in their clinical years. For a majority of the sessions, there was a statistically significant improvement in students' perception towards IPE as assessed by the SPICE-R instrument (Table 3). Although the literature is limited, there are studies indicating that IPE can produce positive outcomes in patient care.[17] This is a difficult variable to define and measure, however, we are encouraged by our students' positive response to this new curriculum. We hope that future research will demonstrate improved coordination and care as IPE curricula is integrated into more patient care settings at our institution.

Students rotated through four sessions that highlighted important IPE topics (TOC, ETHICS, BPMH, and AC) throughout the year. The pre-test SPICE-R mean scores, as shown in Table 3, are high, ranging from 44.62 to 45.55 (out of a total possible score is 50) and are negatively

skewed. These high pre-test values could be explained by the fact that our medical and pharmacy students have had an introduction to IPE through a common educational experience in their preclinical years. The TOC, ETHICS and AC post-SPICE-R results have statistically significant p-values, demonstrating that students acquired further knowledge of interprofessional education in these three sessions.

No significant difference was seen in one session (BPMH). This may be attributed to the order in which the sessions were presented, as most students had already attended two sessions prior to the BPMH session. The BPMH session material also overlapped considerably with the TOC session material, which could have influenced the pre-session results. In addition, BPMH had a smaller number of participants, which also could have contributed to the results (Table 2).

There are a number of barriers to the design and implementation of a new IPE curriculum, including a lack of faculty and financial support as well as time constraints. To overcome some of these challenges, we used the momentum of our newly established School of Pharmacy to design and implement this pilot curriculum. We identified the necessary faculty champions early in the development process, which we feel was critical to our success. Medicine and pharmacy faculty collaborated to design sessions that highlighted topics of interest for both professions. Studies have shown that students prefer to have IPE integrated within the curriculum, rather than added on as a stand-alone activity.[18] Thus, we embedded this combined IPE curriculum into two existing, separate rotations (Pharmacy and Internal Medicine) and did not add to the students' existing academic responsibilities. In a review paper by Milburn and Colyer, it is noted that the organization of IPE is best when "driven by alliances of complementary professions in order to maximize its potential effectiveness and credibility with practitioners"[13] and we used this concept when we chose pharmacy and medical students for our IPE pilot.

The number of disciplines involved in IPE can vary widely, from collaborations between two health profession training programs such as in our pilot study to global platforms that bring human, animal and environmental health together.[19] The intended outcome of IPE is collaborative practice [20] which could translate into improved quality and efficiency of patient care. According to the updated IPEC (Interprofessional Educational Collaborative) Core Competency Report,[21] IPEC's decision to integrate an Interprofessional Collaborative Domain into the IPE competencies is a direct result of the increasing focus on CMS Triple Aim goals (improving experience of care, improving the health of populations, and reducing the per capita costs of health care) and the rollout of the Patient Protection and Affordable Care Act.

Student IPE from prelicensure to clinical practice is needed to achieve the CMS Triple Aim goals. While our study was limited to two health professions, the concepts and methods used to create our IPE pilot curriculum could be applied across the healthcare practice continuum to achieve CMS triple aim. Health education and health behavior models are instrumental in achieving this goal[22] and are important concepts to understand as CMS implements MACRA (Medicare Access & CHIP Reauthorization Act of 2015). MACRA is one of several CMS value based programs and will reward physicians for value over volume.[23] MACRA will require a more efficient, higher quality, and collaborative delivery model of health care that currently does not exist broadly. While IPE and intercollaborative practice are not new concepts, they are newly being recognized as a way to comply with health care reforms such as MACRA.[24]

We must provide our health professional students the skills to master these team based and collaborative care concepts. One way to provide students these skills is through a peer leadership model.[25] Our IPE sessions utilized peer leadership concepts using students as leaders. Our IPE sessions require collaborative efforts and appreciation of others knowledge to successfully work through the proposed patient care scenarios. As stated previously, we are encouraged that our students acquired knowledge in team base and collaborative care concepts, but it is important to take this concept beyond the classroom and into the clinic setting. According to Brandt et al., more research is needed to assess IPE's influence on population health or patient health outcomes.[26] This is an important point since one of CMS triple aim goals is population health.

A logical next step in applying concepts from our IPE experience more broadly could be in the area of Chronic Care Management (CCM). A CCM IPE curriculum would take advantage of professions (clinicians, nurses, social workers, chronic care navigators, pharmacists and dieticians) that currently practice in our primary care clinics. Students could collaborate to complete a needs assessment (understanding of medications, disease processes, barriers to care etc.) of the patient and develop a comprehensive care plan. Multiple health behavioral models to affect patient change are available and one that could be applied to a CCM IPE initiative is the stages of change model.[22] This model recognizes that people have special informational needs at each stage of behavioral change and is able to offer the most effective intervention strategies at each of these stages. Research measuring patient success via outcome measures using this model could provide useful insights as to what methods work well for our patient population.

We acknowledge a number of limitations with our study. IPE has been introduced in a much larger group setting in both schools early in their education. This pre-exposure to an IPE experience could have affected our results. Scheduling differences did not allow for all students to attend all four sessions and the smaller sample size in certain IPE sessions could have resulted in statistical bias. Additional statistical bias could have resulted from students knowing they were part of a pilot study. Lastly, since our surveys were anonymous, we cannot assess differences between medical and pharmacy students.

Conclusion

LCME and other credentialing bodies require IPE. The literature offers little guidance for how to proceed with its implementation, however. Before educators can provide quality IPE experiences, barriers to its implementation must be overcome. In this study, faculty champions of complementary professions implemented a pilot IPE curriculum into existing curricula. The curriculum successfully increased students' perception of interprofessional teamwork and team approach to care. This IPE curriculum was developed with minimal use of existing resources and can easily be modified to include any healthcare profession. As a result of this pilot study, IPE has been successfully integrated into our medical and pharmacy students' respective curricula where none existed before. As integration moves forward, it is our hope this pilot can serve as an example of how IPE can be implemented. Lastly, as the delivery of healthcare moves toward team work and care coordination, it is essential that educators provide students the skills they need to be successful health care providers in the future.

References

1. CAIPE. Interprofessional education- the definition [Internet]. [cited 2016 Nov 28]. Available from: http://caipe.org.uk/resources/defining-ipe/
2. ACPE. Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. 2016 [Internet]. [cited 2016 Nov 29]. Available from: https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf
3. LCME. A best evidence systematic review of interprofessional education: BEME Guide no. 9. Med Teach [Internet]. 2007;29(8):735–51. Available from: http://umsc.org.uic.edu/documents/LCME_standards.pdf
4. Hammick M, Freeth D, Koppel I, Reeves S, Barr H. A best evidence systematic review of interprofessional education: BEME Guide no. 9. Med Teach. 2007;29(8):735=751.
5. Lumague M, Morgan A, Mak D et al. Interprofessional education: the student perspective. J interprofessional care. 2006;20(3):246–53.
6. Centers For Medicare & Medicaid Services. CAHPS survey for accountable care organizations Participating in Medicare Initiatives. [Internet]. [cited 2016 Nov 29]. Available from: acocahps.cms.gov
7. Marshall Medical Outreach. No Title [Internet]. [cited 2016 Nov 29]. Available from: https://jcesom.marshall.edu/students/student-organizations/marshall-medical-outreach
8. Marshall Physician receives national distinction for multiple sclerosis care. [Internet]. [cited 2016 Nov 29]. Available from: https://jcesom.marshall.edu/news/musom-news/marshall-physician-receives-national-distinction-for-multiple-sclerosis-care
9. WV-GRIT [Internet]. [cited 2016 Nov 29]. Available from: https://sole.hsc.wvu.edu/Apps/News/Files/beafdfb1-da96-4689-b0a2-eb9f3840f6f8/GRIT Brochure 2015.pdf
10. Lash DB, Barnett MJ, Parekh N, Shieh A, Louie MC, Tang TT. Perceived benefits and challenges of interprofessional education based on a multidisciplinary faculty member survey. Am J Pharm Educ. 2014;78(10):180.
11. Ho K, Jarvis-Selinger S, Borduas F et al. Making interprofessional education work: the strategic roles of the academy. Acad Med J Assoc Am Med Coll. 2008;83(10):934–40.
12. Olson R, Bialocerkowski A. Interprofessional education in allied health: a systematic review. Med Educ. 2014;48(3):236–46.
13. Milburn PC, Hazel C. Professional knowledge and interprofessional practice. Radiography. 2008;14(4):318–22.
14. The Interprofessional Education Collaborative. Core Competencies for Interprofessional Collaborative Practice [Internet]. [cited 2016 Nov 28]. Available from: http://www.aacn.nche.edu/education-resources/ipecreport.pdf
15. Dominguez DG, Fike DS, MacLaughlin EJ, Zorek JA. A comparison of the validity of two instruments assessing health professional student perceptions of interprofessional education and practice. J interprofessional care. 2015;29(2):144–9.
16. Zorek JA, MacLaughlin EJ, Fike DS, MacLaughlin AA, Samiuddin M, Young RB. Measuring changes in perception using the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education (SPICE) instrument. BMC Med Educ. 2014;14:101.
17. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: effects on professional practice and healthcare outcomes. Cochrane database Syst Rev. 2013;3(d002213).
18. Gilligan C, Outram S, Levett-Jones T. Recommendations from recent graduates in medicine, nursing and pharmacy on improving interprofessional education in university programs: a qualitative study. BMC Med Educ. 2014;14(1):14–52.
19. One Health Initiave. About the One Health Initiative [Internet]. [cited 2016 Dec 29]. Available from: http://www.onehealthinitiative.com/about.php
20. Zeirler B. Interprofessional Education and the Affordable Care Act. Clin Sch Rev. 2014;7:96–7.
21. IPEC. Core Competencies for interprofessional Collaborative Practice: 2016 update. [Internet]. [cited 2016 Dec 29]. Available from: https://ipecollaborative.org/uploads/IPEC-2016-Updated-Core-Competencies-Report__final_release_.PDF.
22. WHO. Health education: theoretical concepts, effective strategies and core competencies. [Internet]. [cited 2016 Dec 29]. Available from: http://applications.emro.who.int/dsaf/EMRPUB_2012_EN_1362.pdf.

23. Centers For Medicare & Medicaid Services. MACRA - Delivery System Reform, Medicare Payment Reform [Internet]. [cited 2016 Dec 29]. Available from: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-MIPS-and-APMs.html
24. NACNEP. Incorporating Interprofessional Education and Practice into Nursing. Thirteenth Report to the Secretary of the Department of Health and Human Services and the United States Congress. [Internet]. [cited 2016 Dec 29]. Available from: https://www.hrsa.gov/advisorycommittees/bhpradvisory/nacnep/Reports/thirteenthreport.pdf
25. Leichliter M. . Creating Opportunities for Peer Leadership in Honors Education. (2013). Honors in Practice-Online Archive Paper 225 [Internet]. [cited 2016 Dec 29]. Available from: http://digitalcommons.unl.edu/nchchip/225/
26. Brandt B, Lutfiyya MN, King JA, Chioreso C. A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim. J interprofessional care. 2014;28(5):393–9.