

Change in Self-Reported Interprofessional Behaviors of Undergraduate Health Professions Students after Participating in Interprofessional Training

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Abstract

INTRODUCTION Interprofessional educational opportunities are becoming more common in training of undergraduate, prelicensure health profession students. Recent reviews note some effectiveness of these programs in collaborative practice skill and behavior improvement. The purpose of this study was to assess the effect of an interprofessional, team-based, elder-home- visiting program on undergraduate health profession students' self-reported interprofessional behaviors.

METHODS A semester-long, interprofessional elder-home-visiting program was conducted for 79 upper-level undergraduate health professions students (nursing, public health, athletic training, speech-language pathology), along with medical and dental students. Only the undergraduate health professions student participants were surveyed to examine their self-reported pre/post program change in collaborative competency behaviors.

RESULTS Statistically significant differences in all pre/post total and subscale mean scores were found. By health profession, only public health and nursing students reported significant collaborative competency behavior changes in all subscales.

DISCUSSION This interprofessional program proved highly successful in improving participants' perceived levels of collaborative competency behaviors. Structuring the program experience to require reliance on a broad spectrum of skills and knowledge can assist health professions students in understanding and demonstrating the core collaborative competencies.

CONCLUSION Evidence to support interprofessional understanding and practice of collaborative competency behaviors, particularly for public health and nursing students, can be obtained through interprofessional educational experiences.

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Implications for Interprofessional Practice

- The elder-home-visiting program was comprehensive, and multiple aspects of the program may have led to its success. When designing future interprofessional training opportunities, educators should incorporate such elements as team teaching, review sessions, and, when possible, real world scenario-based learning.
- Results of this current study add to the evidence in support of self-perceived collaborative competency behavior improvement in short-term interprofessional education interventions.
- Significant differences in improvements in patient-centered approach and team functioning between nursing and public health participants indicates a greater need for public health students to participate in experiences like this to gain a better understanding of team-based concepts in patient care.

Introduction

The necessity for collaboration among healthcare professionals for the furtherance of patient care is undeniable, and no single profession can supply practitioners with the knowledge and skills necessary to maintain the entire health and well-being of patients (Bosch & Mansell, 2015). Thus, it is necessary to seek assistance from colleagues across healthcare disciplines.

Interprofessional education programming in the university setting is viewed as an effective and feasible way to train health professions students for this type of collaborative, team-based patient care so they can enter the healthcare workforce well-prepared (IPEC, 2016). It is hoped that when various health professions students learn with and about each other in prequalification, university-based, interprofessional education programs, team-based knowledge, attitude, and skills learned will transfer to their future healthcare practices. Bosch and Mansell (2015) have identified five characteristics that are necessary for the success of interprofessional teams including “role clarity, trust and confidence, the ability to overcome adversity, the ability to overcome personal differences, [and] collective leadership” (pp. 176–178). Gaining knowledge of team roles, shared decision-making, and shared leadership—as well as learning to value differing expertise—are important components of effective interprofessional education and practice (Lampkin, Levett-Jones, & Gilligan, 2013).

Core competencies and subcompetencies for interprofessional practice, a professional framework for curriculum development, were established to assist in the educational progression from health professions student to healthcare practitioner. From prequalification through clinical practice, the population-based and patient-centered “core competencies” include “Values/ethics for Interprofessional Practice, Roles/Responsibilities, Interprofessional Communication, [and] Teams and Teamwork” (IPEC, 2016, p. 10).

Literature Review

In systematic reviews on the effect of these purposive interprofessional education intervention programs, health and allied health profession student attitudes toward the interprofessional process and team-based decision-making seemed to improve (Lampkin et al., 2013), and collaborative knowledge improvements were also reported (Nelson, White, Hodges, & Tassone, 2017). Most prelicensure, early education studies report generally positive outcomes in regard to improved interprofessional beliefs and knowledge. Although knowledge gains and positive attitudes toward interprofessional teamwork are important, additional research has been called for to determine if interprofessional education may lead to effective collaborative behavior change (Mishoe et al., 2018).

Some positive effects on short-term interprofessional skill improvement, as well as possible enhancement of collaborative practice behaviors, have started to

be reported (Reeves et al., 2016; Reeves, Palaganas, & Zierler, 2015). Student team training in the core competencies for interprofessional practice using interprofessional simulation has shown some promise in improved student perceptions of their collaborative behaviors in all four interprofessional competency domains (Reed et al., 2017). In a semester-long, free-clinic, service-learning and workshop program, health profession student participants also self-reported improvements in all four core collaborative competencies (Sevin, Hale, Brown, & McAuley, 2016). Additionally, through an interprofessional blended clinical simulation experience, health and social professions participants self-reported significantly improved interprofessional competence (Reisen, Morley, Clendinneng, Oglivie, & Murray, 2012). When graduate health professions students participated in a short, half-day interprofessional program, they too met minimum competence levels (Knecht-Sabres et al., 2016). Longitudinally, those health and health-care professionals who participated as undergraduates in a semester-long interprofessional education curriculum that emphasized teamwork behaviors continued to report positive collaborative behaviors in their current postgraduation practices. By profession, though, public health professionals from that program reported significantly higher perceived collaborative behaviors than nursing professionals from that program (Ketcherside, Rhodes, Powelson, Cox, & Parker, 2017).

More research, however, needs to be conducted on interprofessional behaviors all along the learning continuum—from prelicensure through professional practice. It is recommended that researchers more thoroughly evaluate the association between interprofessional education and interprofessional behaviors in the collaborative competencies, especially as it concerns teamwork skills in practice. Early assessment of this association in prequalification health profession students, including undergraduates, should fall to researchers in the university setting (Cox, Cuff, Brandt, Reeves, & Zierler, 2016). Therefore, the purpose of this study was to assess the effect of an interprofessional, team-based home visiting program on undergraduate health profession student participants' self-reported interprofessional behaviors.

Methods

Sample

A total of 79 upper-level undergraduate health professions students (37 nursing, 30 public health, 6 athletic training, 6 speech-language pathology) enrolled with medical and dental students in a semester-long interprofessional, elder-home-visiting program were asked to take part in the study. With study focus on early pre-professionals, only the undergraduates were asked to participate. In addition, the medical and dental schools would not allow graduate participation. All undergraduates were enrolled in an elective course in their major. They knew in advance from the syllabus that the course included participation in the interprofessional program and that participation in the study portion was voluntary. Appropriate ethics board (IRB) approval was obtained, and all completed the consent form and took part in the study. To avoid any possible instructor coercion, during the consent process, the course instructor stepped out of the room as the researcher collected consent forms.

Instrument

The Interprofessional Collaborative Competencies Attainment Survey (ICCAS) was used to assess participants' pre/post program change in self-reported collaborative competency behaviors (Archibald, Trumpower, & MacDonald, 2014). Used as a retrospective pre/post assessment, the ICCAS is valid and reliable for use as a self-assessment instrument for collaborative competency practice. The instrument, with a foundation based on IPEC core competencies, was tested on students and professionals using exploratory factor analysis. The instrument demonstrated high internal consistency for two factors (own team role/collaboration: Cronbach's alpha = 0.96; team involvement: Cronbach's alpha = 0.94) on the presurvey. The instrument attained a Cronbach's alpha of 0.98 for postsurvey total of all items (Archibald et al., 2014). In another test by Schmitz et al. (2017) using factor analysis, similar findings were reported for prelicensure health professions students. Both tests concluded that the instrument was thorough for assessing interprofessional collaborative behaviors, and there was overlap among the constructs. However, Schmitz et al. did not support subscale use.

The survey contained 20 items worded as positive behaviors in six categories of interprofessional collaborative competencies: “Communication, Collaboration, Roles and Responsibilities, Collaborative Patient/Family Centered Approach, Conflict Management/Resolution, and Team Functioning” (Archibald et al., 2014, pp. 553–554). The Communication scale included five statements about effective, nonjudgmental speaking and listening. The Collaboration scale included three statements about effective teamwork to enhance patient care. The Roles and Responsibilities scale consisted of four statements about discipline-specific contributions of self and team. The Collaborative Patient/Family Centered Approach scale comprised three statements about using a team approach that included the patient. The Conflict Management/Resolution scale included three statements about addressing team conflict, and the Team Functioning scale included two statements about care planning and practice scope negotiation. Items were arranged on a 7-point Likert-type scale with a “Not Applicable” option (Archibald et al., 2014).

Procedure

Overview: An interprofessional, team-based, elder-home-visiting program was conducted over one semester to provide a short interprofessional education opportunity to health professions students. Coordinated by health professions faculty members from neighboring medical and health science schools, student program participants included undergraduate students from nursing, public health, athletic training, and speech-language pathology from a midsized public university as well as graduate medical and dental students from a local medical school. Interprofessional student teams made three home visits to an elder in the local community over the semester to conduct standardized health-related physical and mental health assessments. Based on the results of the assessments, teams provided their elder with appropriate patient education and health education materials and resources at the next visit. Teams also participated in large-group case-review sessions between visits to demonstrate case-based presentation skills, collaborate interprofessionally between teams for more assistance, and learn from faculty member facilitators about interprofessional core competencies and team-based care.

Program preparation: In preparation for the program, interprofessional student teams were created by the program administrator, a registered nurse, with the intent to mix students of various disciplines depending on the ratio of students in the participating disciplines. Teams included three to four participants, all with members from different disciplines. Each interprofessional student team was then assigned an elder in the local community as their home-visit “patient.” All elder volunteers had been asked to participate in the program by the program administrator. The administrator recruited volunteers by visiting local senior citizen and faith-based groups to promote the program to relatively healthy individuals living in their own homes or in senior living facilities. Interested elders were informed of the program rationale and timeline, as well as their role and responsibilities, and then signed a consent form and waiver. Specifically, elders who volunteered understood that the program was to assist students in improving knowledge and skills in team-based care, that they were to be visited three times by a team, and that they were to participate at the level they were comfortable with in answering psychosocial assessment questions and allowing teams to conduct physical assessments. Elders would receive copies of all assessment results at each visit and were encouraged to share results with their primary care provider. If any significant health issues were found, teams were to contact the program administrator who would follow up with the elder. If there was conflict among the team or between the elder and the team, elders were also to contact the program administrator for follow-up and resolution.

Program orientation: At the beginning of the program, all student participants attended an evening-long orientation session led by health professions faculty members. After they were oriented to their teams, student participants were then introduced to the concepts and competencies of interprofessional education and team-based/patient-centered care. Common geriatric health issues were described, standardized assessment instruments were reviewed, and a program website housing program schedule, procedures, and all program materials and assessment details was provided.

Program visits: Teams then worked together on their own time to make appointments with the elder for the visits, plan and coordinate the content of their visits,

conduct their visits and assessments, and record assessment results. During the first visit early in the semester, teams introduced the elder to the general process to be followed. Visits would usually include vital sign assessment; updates on any health, medication, or medical changes the elder has experienced since the last visit; team sharing of health education information and materials based on the previous visit; and new assessments to be conducted by the team. At that first visit, teams conducted an overall health screening assessment including vital signs, a brief medical/social history, and a current medication list. A falls risk assessment (BrightStar Home Safety Checklist), nutrition screening (American Dietetic Association), and health literacy assessment (Newest Vital Sign) were also completed. The second visit, held mid-semester, included provision of educational materials to meet elder-health needs and wants according to previous assessment results. Assessments of oral health (Oral Health Assessment Tool for Dental Screening, OHAT), vision (Snellen Vision Chart/Age-Related Macular Degeneration, AMD; Amsler Grid), and hearing (National Institutes of Health), as well as a measure of independence (Centers for Disease Control and Prevention/Stay Independent) were conducted. At the last visit, toward the end of the semester, additional educational materials to meet elder-health needs and wants based on prior assessment results were provided, and a battery of psychosocial assessments (Two-Question Depression Screen, Duke Social Support Survey, HOPE Spiritual Assessment, St. Louis University Mental Status Examination) were conducted.

Program review sessions: Facilitated by the faculty members, a large-group review session for all teams was held during a scheduled evening session one week after the deadline for making each of the three visits. Teams presented their patient case to the group, discussed assessment results and rationale for selected educational material provision, and reviewed how well the team demonstrated interprofessional competency behaviors as they planned, implemented, and evaluated their visits.

Assessment: All undergraduate health professions student participants completed the ICCAS in paper-pencil format during their next discipline-specific class period following the final interprofessional program large-group review session. Participants assessed themselves twice on the interprofessional collaborative competencies: once before the program and once after program

completion (Archibald et al., 2014). Again, course instructors stepped out of the room as surveys were placed in a clasp envelope and collected by the researchers.

Analysis

Subscale scores were computed for each subscale (“Communication, Collaboration, Roles and Responsibilities, Collaborative Patient/Family-Centered Approach, Conflict Management/Resolution, and Team Functioning”) by summing the responses for each item in the given subscale (Archibald et al., 2014, pp. 553–554). Total scale scores were computed by summing the responses for all 20 items. A series of paired t-tests ($n = 7$) were computed to compare retrospective presurvey and postsurvey scores for each of the subscales and total scale. Subsequently, the same series of paired t-tests were repeated four times, each time including data from only one of the four professions under study.

Results

Retrospective presurvey grand mean scores for the six subscales ranged from 5.50 (“Team Functioning”) to 5.89 (“Conflict Management/Resolution”) with possible scores ranging from 1 to 7 (Archibald et al., 2014, pp. 553–554). The total scale retrospective presurvey mean score was 112.52 ($SD = 17.90$) with possible scores ranging from 20 to 140. Post-grand-mean scores for the subscales ranged from 6.44 (“Collaboration”) to 6.64 (“Conflict Management/Resolution”) (Archibald et al., 2014, pp. 553–554). The total post-mean-score scale was 130.48 ($SD = 11.66$). Paired samples t-tests revealed statistically significant differences in all of the subscale pre/post mean scores and the total scale pre/post mean scores when examining all of the professions together (See Table 1).

Examination of pre- and postscores by profession reveals that the scores of nursing students and public health students were statistically significantly different for all six subscales and the total scale. Athletic training students’ scores were statistically significantly different on the “Collaboration” subscale only, while speech pathology students’ scores were significantly different on all subscales except for the “Collaborative Patient/Family-Centered Approach” subscale, but they were significantly different on the total scale for speech pathology students (See Table 2).

Subscale***	n	Possible Scores	Retrospective-	Postmeasures		Mean	Grand Mean**	Std. Deviation	df	t	p
			Premeasures	Mean	Std. Deviation						
“Communication” (5 items)	78	5–35	28.42	5.68	4.81	32.37	6.47	3.32	77	-9.10	0.00*
“Collaboration” (3 items)	75	3–21	16.63	5.54	3.20	19.33	6.44	2.12	74	-8.48	0.00*
“Roles and Responsibilities” (4 items)	79	4–28	22.42	5.61	3.80	26.11	6.53	2.56	78	-9.22	0.00*
“Collaborative Patient/Family-Centered Approach” (3 items)	74	3–21	16.63	5.54	3.32	19.34	6.45	2.02	73	-7.97	0.00*
“Conflict Management/Resolution” (3 items)	76	3–21	17.67	5.89	3.10	19.93	6.64	1.74	75	-7.55	0.00*
“Team Functioning” (2 items)	79	2–14	10.99	5.50	2.32	13.06	6.53	1.35	78	-9.35	0.00*
Total ICCAS Score (20 items)	67	20–140	112.52	5.62	17.90	130.48	6.52	11.66	66	-9.57	0.00*

*p < 0.01
**Grand means are computed by dividing the mean by the total number of items in the given subscale or total scale.
*** Subscales derived from Archibald et al., 2014, pp. 553–554

Table 1. Paired *t*-test results for retrospective premeasures and postmeasures for subscales and total scale of ICCAS for all professions combined

Subscale***	n	Possible Scores	Retrospective	Postmeasures		Mean	Grand Mean**	Std. Deviation	Mean	Grand Mean**	Std. Deviation	df	t	p
			Premeasures	Mean	Grand Mean**									
“Communication” (5 items)														
Nursing	37	5–35	29.51	5.90	4.11	32.81	6.56	2.89	36	-6.03	0.00*			
Public Health	27	5–35	28.07	5.61	4.73	32.96	6.59	2.49	26	-6.38	0.00*			
Athletic Training	7	5–35	26.43	5.29	4.76	28.86	5.77	4.53	6	-1.29	0.25			
Speech Pathology	7	5–35	26.00	5.20	7.53	31.29	6.26	5.09	6	-3.37	0.02*			
“Collaboration” (3 items)														
Nursing	34	3–21	17.53	5.84	2.53	19.62	6.54	1.75	33	-5.32	0.00*			
Public Health	27	3–21	15.78	5.26	3.87	19.33	6.44	2.25	26	-5.38	0.00*			
Athletic Training	7	3–21	15.29	5.10	2.50	17.43	5.81	3.05	6	-4.22	0.01*			
Speech Pathology	7	3–21	16.86	5.62	3.18	19.86	6.62	1.46	6	-3.07	0.02*			
“Roles and Responsibilities” (4 items)														
Nursing														
Public Health	36	4–28	23.50	5.88	3.24	26.33	6.58	2.24	35	-6.25	0.00*			
Athletic Training	29	4–28	21.62	5.41	4.51	26.59	6.65	1.80	28	-6.30	0.00*			
Speech Pathology	7	4–28	20.71	5.18	2.75	23.71	5.93	4.39	6	-2.05	0.09			
	7	4–28	21.86	5.47	3.29	25.43	6.36	3.55	6	-3.00	0.02*			
“Collaborative Patient/Family-Centered Approach” (3 items)														
Nursing														
Public Health	34	3–21	17.85	5.95	2.56	19.56	6.52	1.80	33	-5.15	0.00*			
Athletic Training	26	3–21	15.07	5.02	3.77	19.42	6.47	1.81	25	-6.38	0.00*			
Speech Pathology	7	3–21	14.86	4.95	3.13	17.29	5.76	3.25	6	-2.00	0.09			
	7	3–21	18.29	6.10	1.71	20.00	6.67	1.29	6	-2.30	0.06			
“Conflict Management/Resolution” (3 items)														
Nursing														
Public Health	35	3–21	18.54	6.18	2.39	20.09	6.70	1.44	34	-5.25	0.00*			
Athletic Training	28	3–21	17.00	5.67	2.57	20.07	6.69	1.14	27	-5.75	0.00*			
Speech Pathology	7	3–21	15.71	5.24	4.07	17.86	5.95	3.29	6	-1.20	0.28			
	6	3–21	18.00	6.00	1.90	20.83	6.94	0.41	5	-3.40	0.02*			
“Team Functioning” (2 items)														
Nursing	36	2–14	11.61	5.81	1.92	12.92	6.46	1.36	35	-6.10	0.00*			
Public Health	29	2–14	10.38	5.19	2.76	13.24	6.62	1.06	28	-6.76	0.00*			
Athletic Training	7	2–14	9.71	4.86	2.14	12.29	6.15	2.43	6	-2.47	0.05			
Speech Pathology	7	2–14	11.57	5.79	1.51	13.86	6.93	0.38	6	-4.04	0.01*			
Total ICCAS Score (20 items)														
Nursing	32	20–140	118.72	5.94	15.50	132.59	6.63	9.80	31	-6.67	0.00*			
Public Health	22	20–140	106.91	5.35	19.80	131.55	6.58	8.86	21	-6.59	0.00*			
Athletic Training	7	20–140	102.71	5.14	17.65	117.43	5.87	20.10	6	-1.95	0.10			
Speech Pathology	6	20–140	111.50	5.58	14.10	130.50	6.53	10.63	5	-3.63	0.02*			

*p < 0.05

**Grand means are computed by dividing the mean by the total number of items in the given subscale or total scale.

*** Subscales derived from Archibald et al., 2014, pp. 553–554

Table 2. Paired *t*-test results for retrospective premeasures and postmeasures for subscales and total scale of ICCA by profession

Discussion

In this study, over the course of a semester, 79 undergraduate health professions students from four different disciplines were assessed after they worked in interprofessional healthcare teams with elders in the community. In the process of that experience, undergraduate participants self-reported their collaborative behaviors and understandings of their counterparts on the team. Significant perceived improvements were seen across all interprofessional collaborative competency behavior areas. Self-assessed improvements were significant in communication, cooperative skills, understanding of the patient education process in a team environment, and conflict management (Archibald et al., 2014). Results of this study provide evidence to support recent literature that notes self-perceived and self-assessed collaborative competency behavior improvement in short-term interprofessional education interventions (Knecht-Sabres et al., 2016; Sevin et al., 2016).

A possible explanation for the significant self-reported behavior improvements is the program's focus on and repetition of core interprofessional competencies, especially team-based practice and communication practices. Not only were the behavioral competencies introduced didactically at the first orientation meeting, but they were also emphasized and repeatedly practiced by participants during three home visits over the course of a semester, and then reinforced during each of the three review sessions. Shared decision-making and shared leadership skills and behaviors were needed to successfully plan and conduct each visit as well as to decide what health education materials to provide the patient at the next visit. In addition, as teams presented their patient case to the larger group, they reviewed how well the team demonstrated interprofessional competencies as they planned, implemented, and evaluated their visits. Another potential explanation for the success of this program was the designed need to rely on others in the team during elder assessments. The breadth of assessments being conducted required team members to collaborate, as each person with the specific assessment expertise would need to explain how to implement and interpret that assessment to the rest of the team.

An interesting outcome exists in the significant differences in improvements by profession in all subscales for nursing and public health participants only. This

concept is central to the training of nursing students and is starting to be emphasized in the standard training of undergraduate students in public health. Population health is the focus of the updated core competencies (IPEC, 2016), and the public health program in this study focused on bio-behavioral health education and population health promotion. Students were being prepared as health promotion program planners/evaluators for individual and population-based disease prevention programming and as health administrators and policy makers for both public and private sectors. National program accreditation standards and professional certification for undergraduate public health programs state that curricula include experiences working with partner organizations (Council on Education for Public Health, 2016; National Commission for Health Education Credentialing, Inc., 2015).

This study demonstrated positive changes in participant perceived, self-reported collaborative competency behavior changes; however, it cannot be implied that perceptions result in tangible behavior changes that may lead to improved patient outcomes in the future. It is hoped that when health professions students learn and work with each other in prelicensure interprofessional clinical education programs, improvements in teamwork and collaborative competency behaviors will carry over into their future clinical practice (Lampkin et al., 2013).

Limitations

Although the results of this study provide evidence for the effectiveness of purposeful interprofessional education on collaborative behavioral competency among health profession students, certain limitations should be noted. The most significant limitation of this study is that it does not address whether perceived changes translate into real behavior changes, and if so, whether these changes exist after graduation. A longitudinal study is recommended as follow-up.

The participants in this study were students attending school in a single, midwestern state. While the extent to which geographic location should be considered a factor when interpreting results of this study is unknown, the data may not be generalizable to all students. In addition, this study did not utilize a control or comparison group, which would be necessary to verify whether

or not the results were truly due to the elder-home-visiting program. Further, the use of a retrospective pretest, although considered acceptable, is not without shortcomings. Factors such as recall bias may have impacted results, and findings from future studies using a more traditional pre/post design should be compared to those found in this study to validate the findings.

Although the elder-home-visiting program described in the present study was multifaceted, it was certainly unique given the collaboration between students and faculty from two institutions and the resources available. It is important to establish the effectiveness of other interprofessional educational programs that can be implemented with fewer or alternative resources, as other institutions of higher learning may have limited assets. Establishing a known evidence base of effective interprofessional training characteristics will set a framework for best practices. Along with addressing the noted limitations, in future studies, it will also be important to determine the long-term effectiveness of collaborative trainings after students graduate. As the ultimate goal is to increase collaboration among healthcare professionals, longitudinal studies designed to assess collaborative behaviors will be necessary. The extent to which these trainings have a positive impact on professional practice is currently unknown.

Conclusion

By demonstrating perceived behavior changes that hopefully will lead to future interprofessional practice, the results of the present study show that interprofessional education and collaborative opportunities can be successful. However, more research is needed to examine any longitudinal behavioral practice changes that can be attributed to interprofessional education. It would behoove all institutions that train health professionals to actively imbed interprofessional education opportunities within the existing curriculum or create opportunities for interprofessional training outside of the classroom. The elder-home-visiting program was comprehensive, and multiple aspects of the program may have led to its success. When designing future interprofessional training opportunities, educators should incorporate such elements as team teaching, review sessions, and, when possible, real-world scenario-based learning.

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