

Attitudes and Perceptions of Non-Clinical Health Care Students Towards Interprofessional Learning

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Abstract

BACKGROUND Research on interprofessional learning and education has primarily focused on undergraduate programs, intervention-based programs and clinical programs. Efforts should also be made to examine attitudes of graduate students who are enrolled in non-clinical health profession programs.

PURPOSE The purpose of this study was to explore attitudes of non-clinical graduate health care students towards interprofessional learning and to examine differences in these attitudes and perceptions among students from differing university health programs.

METHODS A quantitative survey adapted from the Readiness for Interprofessional Learning Scale survey was sent to students enrolled in non-clinical graduate health programs at a university. A demographic section was added to collect information about the participants.

RESULTS Two hundred and ninety six students from eight different health programs participated in this study, representing an 85.54% completion rate. Of the total respondents, 47.6% were enrolled in the Doctor of Health Science program, and 55.5% worked in health organizations. Findings suggested that students in different health programs considered teamwork and collaboration important to function in health care. Students felt that focus on interprofessional learning may lead to improvement in communication and problem-solving abilities.

CONCLUSION Implementation of interprofessional learning curricula may enhance understanding of the work of other health professionals which could result in better patient care. These findings could help educational institutions as they advance towards implementing interprofessional educational curricula.

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Implications for Interprofessional Practice

- This research suggests that interprofessional learning may lead to enhanced teamwork, collaboration, and communication among team members. The ability to understand each other's roles and proper communication may also lead to better patient care and improved quality of care.
- Knowledge of team members' roles and responsibilities improves problem-solving skills and may lead to better coordination between care providers.
- Because graduate students appreciate the opportunity to learn from each other, efforts should be made to change and/or revise current curricula and include learning modules with content in interprofessional practice and patient-centered care.
- Incorporation of the interprofessional learning framework across academic disciplines will help students in understanding the work of other health professionals. This may result in improved clinical and administrative practices within health care settings upon graduation from such programs.

In the United States and across the world, there has been an increasing recognition that individuals from different disciplines in health care often lack understanding of each other's roles in the patient care process. Focus on interprofessional learning may enhance understanding of different health professions, which can promote better understanding and teamwork among these individuals (Olson & Bailocerkowski, 2014; Sanson-Fisher, Baitch, & Peterson, 2005). The World Health Organization (WHO) and agencies that work closely with WHO recognize interprofessional learning and collaboration as a potential solution that could help in the reduction of workforce problems in health care organizations across the world. Interprofessional learning interventions allow students from different disciplines to work together and develop skills needed to communicate effectively in a multidisciplinary environment. This may lead to reductions in adverse events and medical errors in health care settings (Brock et al., 2012). It has also been suggested that a focus on interprofessional learning fosters teamwork and collaboration in health care settings (Barwell, Arnold, & Berry, 2013; Darlow et al., 2015; WHO, 2010).

Background

Rising health care costs, poor patient outcomes, shortage of health professionals, and lack of integrated systems creates multiple challenges for the health care

system in the United States and globally (Institute of Medicine [US] and National Academy of Engineering [US], 2011; Suter, Oelke, Adair, & Armitage, 2009). Additionally, lack of understanding of team members' roles, and errors in communication during the patient care process, not only affects the quality of patient care, but can also lead to serious adverse events (Beuzekom, Boer, Akerboom, & Hudson, 2010; Sevdalis, Hull, & Birnbach, 2012). It has also been suggested that highly coordinated teamwork is required to serve complex patients as no single discipline is prepared to deliver all of the needed care (Darlow et al., 2015). Effective collaboration can lead to better outcomes for patients who suffer from conditions such as depression, heart ailments, cancer, and diabetes (Darlow et al., 2015).

Greater emphasis on interprofessional learning and education is needed to prepare health professionals who demonstrate increased understanding of roles and responsibilities of colleagues from different disciplines (Darlow et al., 2015; Park, Hawkins, Hawkins, & Hamlin, 2013; Robben et al., 2012). The Center for the Advancement of Interprofessional Education (n.d.) stated that opportunities for interprofessional education occur when students learn from each other and work collaboratively to achieve better patient outcomes. There is an increased emphasis to incorporate content on interprofessional education in learning activities at institutions of higher education.

Because of increased focus on interprofessional learning, academic institutions have started exploring innovative methods so that these concepts can be included in educational programs and/or appropriate changes can be made to existing curricula (Barwell et al., 2013; Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011). For example, faculty members at the University of South Carolina redesigned their IPE course to include both clinical and non-clinical health care students. Concepts related to patient safety, social determinants of health, systems in health care, and health disparity were also included in the course. This course modification allowed students from different disciplines to see how health care professionals work together to provide care to patients and community (Addy, Browne, Blake, & Bailey, 2015). A similar approach has been put into practice at the University of Kansas Medical Center (KUMC) where students from a non-clinical health program participated in IPE activities with students in clinical disciplines. The aim of these activities was to emphasize the importance of teamwork in health care settings. These activities allowed non-clinical students to learn about health care operations, examine how team members work together, observe different processes and work on quality improvement projects in collaboration with students in clinical programs (O'Dell, Belz, Folck, Moqbel, & Pulino, 2015).

Rationale

In the United States and globally, research on interprofessional learning and education has primarily focused on undergraduate programs, intervention-based programs (pre- and post-test), and clinical programs (Bridges et al., 2011; Hayahi et al., 2012; Poling, Labarbera, & Kiersma, 2015; Saini et al., 2011; Wang, Shi, Bai, Zheng, & Zhao, 2015; Wakely, Brown, & Burrows, 2013). Much research has also been conducted where students are required to engage in clinical training with students from different health care disciplines. While it is important to understand the perceptions of undergraduate students and of those who are enrolled in clinical programs (Hayahi et al., 2012; Tan, Jaffar, Tong, Hamzah, & Mohamad, 2014), efforts should also be made to examine attitudes towards interprofessional learning of graduate students who are enrolled in non-clinical master's or doctoral health care programs. It is important to focus on non-clinical health programs as students in these programs also have a major role

in patient care processes in health care facilities. This could also help educational institutions as they work on including interprofessional learning curricula in non-clinical graduate-level programs.

Significance

Because there is still a scarcity of research on interprofessional education and learning, this research could both contribute to the academic knowledge base and have wide practical applications. Dissemination of findings could help non-clinical graduate health care programs and educational institutions as they advance towards implementing interprofessional educational curricula. Implementation of interprofessional learning modules may also enhance understanding of the work of other health professionals which could result in better patient care (Bridges et al., 2011). The purpose of this quantitative descriptive study was to explore attitudes of non-clinical graduate health care students towards interprofessional learning and to examine differences in these attitudes and perceptions among graduate students from differing university health programs.

Methods

Research Design

This study utilized a quantitative descriptive cross-sectional study research design where participants were requested to answer a brief electronic survey aimed at assessing readiness towards interprofessional learning. This survey was open for 2 months, and efforts were made to examine differences, descriptively, in attitudes of students who were enrolled across several health professions programs.

The sample for the study was drawn from the students who were enrolled in the non-clinical master's and doctoral health profession programs at a leading health sciences university in USA. The university offers several non-clinical doctoral and masters programs in online format. It is important to note that IPE activities are integrated throughout the curriculum of health professions programs at the university. The students also participate in several projects that allow them to work with professionals across different clinical and non-clinical disciplines in health care. The electronic survey was

open from August, 2016, to October, 2016. Of the total 346 students who were eligible to participate in the study, 50 students were not included in the analysis as they did not complete the majority of the survey. There were 296 usable cases (85.54% completion rate). Graduate students' email addresses were obtained from the registrar's office, and a link to the survey was included in an invitation email sent to the potential participants.

Inclusion/exclusion criteria

Students enrolled in non-clinical master's and doctoral programs at the university were included in the study. These programs include Doctor of Health Administration (DHA), Doctor of Health Sciences (DHSC), Doctor of Health Education (DHED), Master of Health Administration (MHA), Master of Public Health (MPH), MPH with Dental Emphasis, MPH with Dental Emphasis with Dental Public Health Residency certificate, Master of Science in Kinesiology, and Master of Science in School Health Education. Because there is a scarcity of research that aims to examine attitudes of non-clinical graduate students towards interprofessional education, we focused our attention to students in non-clinical programs.

Sampling Methodology

Nonprobability consecutive sampling was used for this research study. Usage of consecutive sampling helped in reaching out to maximum numbers of participants who met inclusion criteria and had an interest in participating in the study.

Ethical considerations/Institutional Review Board approval

This study commenced after approval from A.T. Still University's IRB was obtained. Approval for recruiting participants and permission to access student email addresses was also sought and received from the dean of the school prior to data collection.

Survey Development

The Readiness for Interprofessional Learning Scale (RIPLS) was used to collect data for this study (McFadyen et al., 2005). A demographic section was added

to collect information about the study participants.

Demographics

Items such as gender, race, ethnicity, academic program, type of organization of work, age, length of time in the academic program, and total number of years of professional experience were added to collect demographic information about participants.

Readiness for Interprofessional Learning Scale survey

Permission to use the RIPLS was sought and received prior to beginning the study. This scale consists of 19 items, divided into four subscales: (a) *teamwork and collaboration* (items 1-9), (b) *negative professional identity* (10-12), (c) *positive professional identity* (13-16), and (d) *roles and responsibilities* (17-19; Hertweck et al., 2012; Wilhelmsson, Ponzer, Dahlgren, Timpka, & Faresjo, 2011). With a highest possible score of 45, the *teamwork and collaboration* subscale examines students' attitudes (who engage in interprofessional learning) regarding collaborative learning, trust, respect, and professional limitation. A higher score on this subscale demonstrates that students consider these skills appropriate to function in a team environment (Hertweck et al., 2012). The second subscale, *negative professional identity*, examines negative perceptions about working with students who may be from different areas of expertise. The items in this subscale are reverse coded; an increase in scores on this subscale reflects that student do not value opportunities for shared learning with students who are from different health professions (Hertweck et al., 2012). The third subscale, *positive professional identity*, evaluates items such as communication skills, problem solving abilities, and teamwork, as students engage in shared learning endeavors. Obtaining a high score on this subscale would indicate that students appreciate these learning experiences (Hertweck et al., 2012). The fourth subscale, *roles and responsibilities*, examines whether students have an understanding of their individual roles and those who are working in health care settings. The items in this subscale are reverse coded, with a higher score indicating that students lack clarity regarding their roles and the roles of others who are working in a team (Hertweck et al., 2012).

Reliability and validity of RIPLS

Researchers have also successfully demonstrated test-retest reliability, internal consistency, face validity, and construct validity of the instrument (Hertweck et al., 2012; Reid, Bruce, Allstaff, & McLernon, 2006). Norgaard, Draborg, and Sorenson (2016) confirmed strong internal consistency in three RIPLS subscales (*teamwork and collaboration, negative professional identity, and positive professional identity*). It is also important to note that the instrument was found to be stable when analysis of test-retest reliability was conducted (weighted kappa scores between 0.27- 0.70).

Data Collection

Contact information for potential participants was obtained from the registrar's office and an electronic survey was sent, via email, to all the eligible students who met inclusion criteria. This email also included information about the purpose of the study, research procedures, and benefits and risks (if any) associated with the study. Notification regarding voluntary participation and total estimated time to complete the survey was also included in the email. This survey was open for 2 months, and reminder emails were sent every 14 days. Data were downloaded and stored in a Statistical Package for Social Sciences (SPSS) database.

Data Analysis

The data analysis program, IBM SPSS Statistic version 23.0, was used for storing data, tabulation, and computing descriptive statistics. The data were cleaned, organized, coded, and checked; descriptive statistics were used to analyze demographic variables. For each subscale (i.e., *teamwork and collaboration, negative professional identity, positive professional identity, and roles and responsibilities*), items were summed and scores were calculated. Subscale scores were tested for normality via Shapiro-Wilk test ($p < .05$) and appropriate measures of central tendency and dispersion were reported, both in text and in tabular form. Finally, descriptive comparisons were made between student groups from differing health care programs who participated in the study.

Results

Description of Sample

A total of 346 students were eligible to participate in the study. Of the total respondents, 50 students were excluded from the analysis because they did not complete the majority of the survey. Thus, the total number of usable cases was 296 which represented an 85.54% completion rate. The majority (63.4%) of participants were females. The Shapiro-Wilk (SW) revealed that age was not normally distributed ($p = .00$). The median age of the participants was 38 years ($IQR = 18$) and ranged from 22 to 65 years (see Table 1).

Normality testing was also conducted on the length of time in an academic program and years of professional experience ($p = .00$ for both variables). The median length of time spent by participants in their graduate health programs was 23 months ($IQR = 23$), and ranged from 1-84 months. The majority of students had completed one year in their academic program. The median length/duration of professional experience was 12 years ($IQR = 15$), and ranged from 1- 40 years. Respondents were predominantly Caucasian/white ($n = 224$; 76.5%) and non-Hispanic or Latino ($n = 256$; 91.1%) (see Table 1).

Most respondents were enrolled in the Doctor of Health Science (DHSC) program ($n = 141$; 47.6%), while only a few ($n = 5$; 1.7%) students from the Master of Public Health- Dental Emphasis with Dental Public Health Residency Certificate participated in the research study. Of the total respondents, 55.5% ($n = 162$) worked in health care, while 30.1% ($n = 88$) worked in educational settings (see Table 1). Other participants ($n = 42$; 14.4%) worked in organizations that included, but were not limited to, military, management consulting, professional sports, U. S. Food and Drug Administration, athletic training, aerospace industry, biotechnology firm, and a corporate fitness group.

Findings

Research question 1

The attitudes and perceptions of students from non-clinical graduate health care programs towards inter-

Characteristic	<i>Mdn</i>	<i>IQR</i>	<i>f(n)</i>	%
Age (years)	38.00	18		
Length of time in academic program (in months)	23.50	24		
Years of professional experience	12.00	15		
Sex				
Male			108	36.6
Female			187	63.4
Race				
American Indian or Native American			2	0.7
Asian			21	7.2
Black or African American			35	11.9
Native Hawaiian or Pacific Islander			2	.7
White/Caucasian			224	76.5
Race Other			9	3.1
Ethnicity				
Hispanic or Latino			25	8.9
Non-Hispanic or Latino			256	91.1
Academic Program				
DHA			9	3.0
DHED			63	21.3
DHSC			141	47.6
MHA			10	3.4
MPH			21	7.1
MPH - DE			22	7.4
MPH – DE with DR			5	1.7
MS in Kinesiology			25	8.4
MS in School Health Ed.			0	0
Type of Organization				
Health care			162	55.5
Education			88	30.1
Other			42	14.4

Table 1. *Characteristics of Sample (N = 296)*

Note. DHA = Doctor of Health Administration; DHED = Doctor of Health Education; DHSC = Doctor of Health Sciences; MHA = Master of Health Administration; MPH = Master of Public Health; MPH – DE = Master of Public Health- Dental Emphasis; MPH-DE with DR = Master of Public Health- Dental Emphasis with Dental Public Health Residency Certificate; MS in Kinesiology = Master of Science in Kinesiology; and MS in School Health Ed. = Master of Science in School Health Education.

professional learning were examined. The four subscales, *teamwork and collaboration*, *negative professional identity*, *positive professional identity*, *roles and responsibilities*, and total RIPLS score were tested for normality via the Shapiro-Wilk (SW) test ($p=.00$ for all variables). The median score on *teamwork and collaboration* (subscale 1) was 38; minimum and maximum scores were 9 and 45, respectively. The median score on *negative professional*

identity (subscale 2) was 12 with a minimum score of 3 and a maximum score of 15. The median score on the third subscale, *positive professional identity*, was 16 and ranged from 4-20. The median score on the fourth subscale, *roles and responsibilities*, was 11; minimum and maximum scores were 3 and 15, respectively. Additionally, the total score of RIPLS was also calculated. The median score for this scale was 78 and ranged from 43-95 (see Table 2).

Subscales	<i>Mdn</i>	<i>IQR</i>	<i>Min/Max</i>
Teamwork and Collaboration	38.00	8	9/45
Negative Professional Identity	12.00	3	3/15
Positive Professional Identity	16.00	3	4/20
Roles and Responsibilities	11.00	4	3/15
RIPLS Total Score	78.00	3	43/95

Table 2. Readiness for Interprofessional Learning Scale Subscale Scores ($N = 296$)

Research Question 2

This research also descriptively examined differences in attitudes and perceptions towards interprofessional learning among students from differing non-clinical graduate health care university programs. Results provided a descriptive summary of attitudes and perceptions of graduate students from different non-clinical health profession programs towards interprofessional learning.

Teamwork and collaboration

The *teamwork and collaboration* subscale examines students' (who engage in interprofessional learning) attitudes regarding collaborative learning, trust, respect, and professional limitation. The result of the Shapiro-Wilk test revealed that data were normally distributed for DHA, MHA, MPH, and MPH with DE-DR programs. Other programs such as DHED, DHSC, MPH-DE, and MS in Kinesiology had non-normal distributions. Compared with DHA students and MPH students, MHA students scored lower on the *teamwork and collaboration subscale*. The median score of students enrolled in the DHED program was 39.00 and ranged from 25-45, while similar results were found for the DHSC program and ranged from 9-45 (see Table 3).

Negative professional identity

The second subscale, *negative professional identity*, ex-

amines negative perceptions about working with students who may be from different areas of expertise. The result of the Shapiro-Wilk test revealed normal distributions for the DHA, MHA, MPH-DE, and MPH-DE-DR programs. It is also important to note that other graduate programs did not follow a normal distribution. Compared with MHA students and MPH-DE students, DHA students scored lower on the second subscale. The median score of students enrolled in the DHED program was 12.00 and ranged from 3-15. Similar results were found for the DHSC program, ranging from 4-15, and the MPH program, ranging from 3-15 (see Table 3).

Positive professional identity

The third subscale, *positive professional identity*, evaluates items such as communication skills, problem-solving abilities, and teamwork, as students engage in shared learning endeavors. Review of the results of the Shapiro-Wilk test and plots revealed that DHA, MHA, and MPH-DE programs followed a normal distribution while other program scores did not. Regarding *positive professional identity*, Table 3 shows a significant difference between scores among different groups. DHA students showed positive attitudes and had slightly higher scores than MHA students and MPH-DE students. The median score of students enrolled in the DHSC program was 16.00 and ranged from 4 – 20. Similar results were found for the MPH program (see Table 3).

	<i>M</i>	<i>SD</i>	<i>Mdn.</i>	<i>IQR</i>	<i>Min/Max</i>
DHA					
Teamwork and Collaboration	38.33	4.95			
Negative Professional Identity	10.67	3.84			
Positive Professional Identity	16.44	3.16			
Roles and Responsibilities	9.67	3.39			
RIPLS Total	75.11	10.19			
DHED					
Teamwork and Collaboration			39.00	7.00	25/45
Negative Professional Identity			12.00	4.00	3/15
Positive Professional Identity			16.00	3.00	6/20
Roles and Responsibilities	11.32	2.04			
RIPLS Total	76.94	10.53			
DHSC					
Teamwork and Collaboration			39.00	8.00	9/45
Negative Professional Identity			12.00	3.00	4/15
Positive Professional Identity			16.00	5.00	4/20
Roles and Responsibilities			12.00	3.00	6/15
RIPLS Total			78.00	14.00	43/95
MHA					
Teamwork and Collaboration	37.10	3.60			
Negative Professional Identity	12.00	2.21			
Positive Professional Identity	15.00	3.26			
Roles and Responsibilities	11.40	2.71			
RIPLS Total	75.50	6.04			
MPH					
Teamwork and Collaboration	39.19	4.22			
Negative Professional Identity			13.00	2.00	3/15
Positive Professional Identity			17.00	4.00	12/20
Roles and Responsibilities			11.00	3.00	3/14
RIPLS Total	78.95	6.20			
MPH-DE					
Teamwork and Collaboration			36.00	8.00	29/45
Negative Professional Identity	11.59	2.46			
Positive Professional Identity	15.45	3.49			
Roles and Responsibilities			10.00	2.00	8/14
RIPLS Total	74.59	9.69			
MPH-DE with DR					
Teamwork and Collaboration	34.00	5.70			
Negative Professional Identity	11.40	2.51			
Positive Professional Identity			16.00	4.00	12/16
Roles and Responsibilities			9.00	3.00	9/12
RIPLS Total	69.80	11.28			
MS in Kinesiology					
Teamwork and Collaboration			40.00	7.00	13/45
Negative Professional Identity			14.00	3.00	7/15
Positive Professional Identity			16.00	3.00	4/20
Roles and Responsibilities	10.84	1.97			
RIPLS Total			83.00	13.00	43/88
MS in School Health Education^a					

Note. ^aNo responses from students in MS in School Health Education program.

Table 3. Descriptive Comparison of RIPLS Scores by Academic Programs (N = 296)

Roles and responsibilities

The fourth subscale, *roles and responsibilities*, examines whether students have an understanding of their individual roles and those who are working in health care settings. The result of the Shapiro-Wilk test revealed normal distributions for DHA, DHED, MHA, and MS in Kinesiology programs. Students in the MHA program and DHED program scored slightly higher than students in the DHA and MS in Kinesiology programs (see Table 3). Similar results were reported for the DHSC program and MPH program (see Table 3).

Total RIPLS score

The Shapiro-Wilk test was conducted on the total score of the RIPLS questionnaire, and the results revealed that only DHSC and MS in Kinesiology programs did not follow normal distributions. Compared to students in the MPH program and MS in Kinesiology program, students in the DHA program and DHED program scored lower on total scores of the RIPLS scale. The median score for students enrolled in the DHSC program was 78.00, and ranged from 43-95 (see Table 3).

Discussion

This study goal was to examine the attitudes of students from non-clinical graduate health professions programs towards interprofessional learning. Additionally, efforts were made to examine differences in attitudes and perceptions towards interprofessional learning among students from different university programs. It is important to note that there are several studies that have examined IPE in clinical programs. However, there is a paucity of research that has focused on students enrolled in non-clinical doctoral or masters' programs in health disciplines. Findings suggest that both doctoral and master's students valued shared learning opportunities and felt that working in teams will improve decision-making, problem-solving, and communication skills. Additionally, students felt that shared learning opportunities helped them in thinking positively about other members of the patient care team.

These results are in agreement with the study conducted by Woodroffe, Spencer, Rooney, Le, and Allen (2012) who suggested that interprofessional education can positively affect students' perceptions regarding collaboration, teamwork, and process of care delivery to patients.

These findings are also consistent with the mixed method study conducted by Temple and Mast (2016) where they demonstrated that undergraduate nursing and health administration students not only understood importance of interprofessional practice but were also able to learn from another discipline when they engaged in IPE projects in a team-based setting.

The findings of this research also suggest that shared learning opportunities help in improving communication, clarifying the nature of patient problems, and enhancing understanding of the roles of team members involved in the patient care process. These results are also in agreement with the findings of the study conducted with students enrolled in health programs at the University of Kentucky and Eastern Kentucky University (Myers & O'Brien, 2015). However, researchers noted that including interprofessional education in online modules can be challenging as it requires instructors to explore highly structured online options to engage students. Further, establishing strong social presence in online environment can pose additional challenges while delivering content on interprofessional education in online format (Myers & O'Brien, 2015).

Examination of scores on first sub-scale suggests that students in the doctoral programs and the MPH program not only scored higher but also considered these skills appropriate to function in a team environment. While students in the MHA program scored lower, it is important to note that their scores are more consistent when compared to other programs (less variability). Collectively, lower scores on second and fourth subscale suggest that students valued shared learning opportunities and did not lack clarity regarding their roles and the roles of others who are working in a team. Findings also suggest that students in the MPH program and the DHA program demonstrated stronger appreciation for shared learning experiences when compared to other programs. However, graduate students, across all the programs, felt that interprofessional learning improves problem solving skills and team-work abilities (as indicated by scores). No significant difference was found between scores on different subscales.

Among professional groups/academic disciplines, median scores of students enrolled in DHA, DHED, DHSC, and MPH programs were higher on the teamwork and collaboration subscale. Students in the MHA program scored lower but had more consistent scores

when compared to other students in graduate programs. Furthermore, lower scores were reported on the *negative professional identity* subscale. Notably, doctoral students scored lower when compared to students enrolled in master's programs. Higher scores on negative professional identity suggest students do not value opportunities for shared learning with others from different health professions (Hertweck et al., 2012). Students in doctoral programs, MS in Kinesiology, and MPH programs scored higher on the third subscale (*positive professional identity*) when compared to MHA students. Findings suggest that students across all the programs acknowledged that interprofessional learning improves problem-solving skills and teamwork abilities (despite low scores). With regard to scores on the fourth subscale, *roles and responsibilities*, DHA students scored lower when compared to students enrolled in other doctoral programs. Additionally, students in MPH-DE with DR scored lower than students in other master's programs. A higher score indicates that students lack clarity regarding their roles and the roles of others who are working in a team (Hertweck et al., 2012). While there was variation in scores between different groups/programs, it is important to note that, collectively, all the programs had low scores on this subscale. This indicates that students (in general) across all the programs do not lack clarity regarding their roles and the role of their team members. It is noteworthy, while there was a variation in subscale scores, overall response was not significantly different between students who belonged to a different program of study at the university (master's or doctoral).

Because there is a scarcity of such research, this project provides useful insights regarding attitudes and perceptions of graduate students (in non-clinical programs) towards interprofessional learning especially in online programs. The findings from this research can also be used to make curriculum changes in the non-clinical graduate health professions programs. Instructors and course designers can build classes (elective or core class) that allow students from both clinical and non-clinical disciplines to work on IPE activities in a team-based setting. Inclusion of virtual simulation scenarios, clinical cases, cases related to health systems improvement and patient safety, public health scenarios will not only allow students from different programs to work together but may also enhance understanding of each other's work.

Limitations of the Study

One of the limitations of this study was that the survey was sent to students enrolled in online graduate programs at one academic institution. This may have affected the total number of students who participated in the study (sample size). Inclusion of other universities may have helped in reaching out to graduate students (on-campus and online programs) who are enrolled in other academic disciplines not currently represented in the study sample. Another limitation of this study was the exclusion of students who were enrolled in clinical programs. Inclusion of these students would have increased the number of participants and allowed for comparison between students enrolled in clinical and non-clinical programs (attitudes and perceptions). Lastly, students from the MS in School Health Education program did not participate in the study. Additional reminder emails would have encouraged participation from the students enrolled in this MS program.

Recommendations for Future Research

This research intended to examine attitudes and perceptions of non-clinical health care students towards interprofessional learning at one academic institution. Inclusion of other universities and other academic settings will help in examining what students across several institutions think about interprofessional learning opportunities. Furthermore, attention could also be focused on faculty members who wish to integrate interprofessional learning modules in their classes and course work. This will help in exploring challenges that faculty face as they implement interprofessional learning in the curricula.

Conclusion

The aim of this study was to explore attitudes of non-clinical health care students towards interprofessional learning and to examine differences in these attitudes and perceptions among students from differing university health programs. Findings suggest on-line students in non-clinical programs see the value of interprofessional practice/education. The students in doctoral and master's programs considered teamwork skills important to function in the health care environment. Additionally, non-clinical graduate students (both master's and doctoral) valued shared learning opportunities and felt that interprofessional learning will add to clarity on

roles of different health professionals who work to provide patient care in a team-based setting/environment. Further studies are needed to investigate perceptions and attitudes of faculty members and students across different universities so that critical success factors and barriers can be identified.

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