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Evaluating Communication and Collaboration Among Healthcare Students

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Abstract

The purpose of this pilot study was to determine if the Interprofessional Collaborator Assessment Rubric (ICAR): Communication and Collaboration Dimensions would demonstrate good inter-rater reliability and be a useful and efficient tool to evaluate professional communication and collaboration between occupational therapy (OT) and physician assistant (PA) students. An additional aim of this study was to assess students' thoughts, perceptions, and perceived value regarding these types of interprofessional opportunities. A sequential explanatory mixed methods design was used. An interclass correlation coefficient (ICC) examined the inter-rater reliability of the instrument for both faculty raters (n = 7) and standardized patient (SP) raters (n =5). Qualitative data was gathered from focus groups to assess the utility of the ICAR: Communication and Collaboration. Quantitative and qualitative data were also gathered from a convenience sample of student participants (n =19) to investigate the perceived value of this interprofessional experience. Quantitative data revealed that there was moderate inter-rater reliability for four out of five of the subscales. Three themes emerged from the rater and student focus groups. Students found the interprofessional education (IPE) opportunity to be valuable. They also felt that it enhanced their understanding of the OT/PA profession, as well as their comfort and ability to collaborate and communicate with other professionals. The results of this study suggest that the ICAR: Communication and Collaboration Dimensions has the potential to maintain inter-rater reliability among healthcare students. The results of this study also indicate that healthcare students view IPE events as being highly valuable and beneficial.

Keywords

Interprofessional education, interprofessional communication and collaboration, occupational therapy, physician assistant, ICAR (Modified)

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ABSTRACT

The purpose of this pilot study was to determine if the Interprofessional Collaborator Assessment Rubric (ICAR): Communication and Collaboration Dimensions would demonstrate good inter-rater reliability and be a useful and efficient tool to evaluate professional communication and collaboration between occupational therapy (OT) and physician assistant (PA) students. An additional aim of this study was to assess students' thoughts, perceptions, and perceived value regarding these types of interprofessional opportunities. A sequential explanatory mixed methods design was used. An interclass correlation coefficient (ICC) examined the inter-rater reliability of the instrument for both faculty raters (n = 7) and standardized patient (SP) raters (n =5). Qualitative data was gathered from focus groups to assess the utility of the ICAR: Communication and Collaboration. Quantitative and qualitative data were also gathered from a convenience sample of student participants (n =19) to investigate the perceived value of this interprofessional experience. Quantitative data revealed that there was moderate inter-rater reliability for four out of five of the subscales. Three themes emerged from the rater and student focus groups. Students found the interprofessional education (IPE) opportunity to be valuable. They also felt that it enhanced their understanding of the OT/PA profession, as well as their comfort and ability to collaborate and communicate with other professionals. The results of this study suggest that the ICAR: Communication and Collaboration Dimensions has the potential to maintain inter-rater reliability among healthcare students. The results of this study also indicate that healthcare students view IPE events as being highly valuable and beneficial.

Introduction

One of the major purposes of healthcare education is to develop future practitioners who can provide high-quality services in their respective fields. The Institute of Medicine (2015; 2018) has proclaimed that all health professionals should be educated to deliver patient-centered care as part of an interdisciplinary team. Directives such as this have led to the promotion of interprofessional education (IPE) across many healthcare colleges. In fact, in 2016, the Interprofessional Education Collaborative (IPEC) officially expanded its membership to include the following institutions: American Association of Colleges of Podiatric Medicine (AACPM); American Council of Academic Physical Therapy (ACAPT); American Occupational Therapy Association (AOTA); American Psychological Association (APA); Association of American Veterinary Medical Colleges (AAVMC); Association of Schools and Colleges of Optometry (ASCO); Association of Schools of Allied Health Professions (ASAHP); Council on Social Work Education (CSWE); and Physician Assistant Education Association (PAEA) (Interprofessional Education Collaborative, 2016). There is now sufficient evidence to indicate that IPE enables effective collaborative practice, which has been shown to optimize health services, improve health outcomes, decrease length of hospital stay, decrease hospital admissions and re-admissions, decrease complications, decrease mortality rates, decrease staff turnover, reduce cost of care, and increase patient satisfaction (World Health Organization [WHO], 2019).

The World Health Organization (2019) defined IPE as occurring “when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcome” (p. 7). Interprofessional education is a necessary step in preparing future healthcare workers to be “collaborative practice-ready” (WHO, 2019). Collaborative practice-ready health workers are individuals who have learned how to work in an interprofessional team and are able to competently work with multiple health workers from different professional backgrounds to provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings (WHO, 2019).

Interprofessional communication is one of the four core competencies for interprofessional collaborative practice as established by the Interprofessional Education Collaborative (2016). Effective communication among healthcare providers and patients is essential for optimal outcomes (O’Daniel & Rosenstein, 2008). Because healthcare delivery is increasingly team-based, learning to communicate and collaborate interprofessionally is fundamental to patient safety and a patient-centered approach (O’Daniel & Rosenstein, 2008).

While the IPE literature has described many instruments for the self-assessment of attitudes and perceptions toward other professional disciplines, few studies have addressed interprofessional collaboration. The Interprofessional Collaborator Assessment Rubric (ICAR) was developed for use in the assessment of interprofessional collaborator competencies (Curran et al., 2011). The ICAR has been

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validated through several methods, including a typological analysis of national and international competency frameworks, a Delphi survey of experts, and interprofessional focus groups, including students and faculty (Curran et al., 2010).

The ICAR is a 31-item competency-based assessment tool that evaluates the following six dimensions: (1) communication; (2) collaboration; (3) roles and responsibility, (4) collaborative patient/client-family centered approach; (5) team functioning; and (6) conflict management/resolution (Curran et al., 2016). This tool uses a rubric to assess interprofessional collaborator competencies. The ICAR defines each of the six dimensions and lists a set of performance criteria for each skill. Each of the 31 items is rated on a 4-point scale to identify the level of skill: *1 = minimal; 2 = developing 3 = competent; and 4 = mastery*. Aspects of the ICAR that could limit its practical application in academia include its length and the number of dimensions assessed. Thus, the purpose of this pilot study was to assess the feasibility and inter-rater reliability of using the communication and collaboration dimensions of the original ICAR, which will be referred to as the ICAR: Communication and Collaboration Dimensions, throughout this manuscript. Since the ICAR: Communication and Collaboration Dimensions is more concise than the original, the researchers in this study are hopeful that it may allow for a more efficient way to evaluate communication and collaboration in both simulated and on-site patient encounters during clinical training and provide enhanced practicality for educators and clinicians.

There is evidence to suggest that a shorter, modified version of the original ICAR is valid and can be used reliably (Hayward et al., 2014). However, Hayward's (2014) modified ICAR utilized 17 questions taken from all six dimensions of the original tool. Since the researchers in this study were specifically interested in assessing interprofessional communication and collaboration skills, the primary purpose of this study was to evaluate the feasibility and inter-rater reliability of utilizing an even more condensed, 10-question version of ICAR, which focused solely on interprofessional communication and collaboration skills (i.e., ICAR: Communication and Collaboration Dimensions). More specifically, the purpose of this study was to determine if the ICAR: Communication and Collaboration Dimensions would still demonstrate good to high inter-rater reliability among occupational therapy (OT) faculty, physician assistant (PA) faculty, and standardized patient (SP) raters. SPs were included in this study because the affiliated university hires people who have been professionally trained to portray various patient roles during different clinical case scenarios for both teaching and learning opportunities (e.g., laboratory experiences), as well as for examination purposes (e.g., clinical skill tests, lab practicums, etc.). In addition to the SPs depicting realistic patient interactions and presentations of various clinical conditions, the SPs are trained and experienced in evaluating and giving feedback to the healthcare students on their interpersonal communication skills. Thus, the researchers in this study were not only interested in knowing if the OT and PA faculty demonstrated good to high inter-rater reliability with the ICAR: Communication and Collaboration Dimensions tool, but were also interested in knowing if the SPs demonstrated good to high inter-rater reliability with the ICAR: Communication and Collaboration Dimensions tool since they are typically involved in providing feedback after student and SP encounters. Additional

aims of this study were to determine if the OT, PA, and SP raters viewed the ICAR: Communication and Collaboration Dimensions as an efficient, effective, and useful measure to assess communication and collaboration skills among OT and PA students during a simulated patient encounter. Lastly, this study aimed to assess the OT and PA students' thoughts, perceptions, and perceived value regarding interprofessional opportunities, such as the experience provided as part of this study. All study procedures were completed in compliance with the affiliated university Institutional Review Board.

Methods

Participants

The participants of this study consisted of OT faculty (n = 4), PA faculty (n = 3), and SPs (n = 5) who utilized the ICAR: Communication and Collaboration Dimensions to rate the communication and collaboration skills of the OT and PA students during a simulated patient encounter. The majority of these 12 raters were female (n = 8). The OT and PA faculty raters were a convenience sample of faculty with interest and experience with IPE who collectively applied for an internal grant at the affiliated university. The SP raters were a convenience sample of SPs, employed by the affiliated university, who indicated that they were available during the scheduled time for the offered IPE event. They were selected on a first-come, first- served basis.

A convenience sample of twenty graduate-level students agreed to participate in this pilot study to enable an interprofessional encounter for the raters (faculty and SPs) to assess the student participants' communication and collaboration skills using the ICAR: Communication and Collaboration. The student participant group consisted of 10 first-year OT students and 10 first-year PA students. The OT and PA students were recruited via email announcements and were informed that involvement in this activity was completely voluntary. The selection was based on a first-come, first- served basis. A $20 gift card was awarded to the participants to facilitate recruitment and to compensate student participants for their time. The 20 student participants were randomly placed in 10 different teams consisting of one OT student and one PA student. On the day of the event, one PA participant unexpectantly became ill prior to the event. To prevent canceling one of the OT/PA encounters, one of the PA students volunteered to participate twice and was paired up with two different OT students for two different interprofessional encounters with a SP.

Research Instrument

The ICAR: Communication and Collaboration Dimensions consisted of a total of six items under the *Communication* dimension of the original ICAR tool and included three items related to *Respectful Communication* and three items related to *Communication Strategies*. The three items associated with *Respectful Communication* rated mastery level of skill as: (1) consistently communicates with others in a confident, assertive, and respectful manner; (2) consistently communicates opinion and pertinent views on patient care with others; and (3) consistently responds or replies to request in a timely manner. The other three items under the *Communication* dimension on the ICAR:

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Communication and Collaboration Dimensions were related to *Communication Strategies* and had a mastery level of skill designated as: (1) consistently uses communication strategies (verbal and non-verbal) appropriately in a variety of situations; (2) consistently communicates in a logical and structured manner; and (3) consistently explains discipline-specific terminology/jargon. The remaining four items used on the ICAR: Communication and Collaboration Dimensions were under the *Collaboration* dimension of the original ICAR tool and included: (1) a *Collaborative Relationship*, with mastery level of skill as consistently establishes collaborative relationships with others and (2) *Integration of Information from others*, with mastery indicated as consistently integrates information and perspectives from others in planning and providing patient/client care. The last two items in the ICAR: Communication and Collaboration Dimensions under the *Collaboration* dimension were associated with *Information Sharing*, with mastery as (1) consistently shares information with other providers that is useful for the delivery of patient/client care and (2) consistently seeks approval of the patient/client or designated decision maker when information is shared. One of the items on the original ICAR under *Communication Strategies* was deleted because it was irrelevant to the case scenario used in the interprofessional encounter for this study, and because none of the raters in the pre-pilot study scored this item. For this particular (deleted) item, *mastery* level of skill is indicated by consistently using strategies that are appropriate for communicating with individuals with impairments (e.g., hearing, cognitive). This item was irrelevant and was not scored by any of the raters since the SP acting out the case scenario for this encounter did not have or exhibit any hearing or cognitive impairments.

Pre-Pilot Study

Prior to this study, a pre-pilot study was completed to help inform the researchers regarding the logistics of the interprofessional event (e.g., amount of time needed to train the SPs, adequate amount of time allotted for the IPE encounter, etc.). The pre-pilot study also investigated the inter-rater reliability of the tool with *faculty* raters and inter-rater reliability as it pertained to both faculty and SP ratings. Since the interclass correlation coefficient was reasonably high (.961 for faculty only, .968 for faculty and SPs), the researchers proceeded to this study. The pre-pilot portion of this study was conducted in-person in July 2019.

This study was scheduled to begin in March of 2020 but was delayed due to COVID-19 restrictions with in-person events. In order to continue with this study during the pandemic, the OT and PA student encounters with SPs were conducted remotely via Microsoft Teams in March of 2021.

IPE Event

The SPs were provided a case scenario of a common medical complaint that was comparably applicable to OT and PA practice. The SP raters participated in a 30-minute preparation session immediately prior to the event to introduce them to the ICAR: Communication and Collaboration Dimensions and to train them in their roles as patient and rater. Faculty raters met prior to the pre-pilot study to review the ICAR: Communication and Collaboration Dimensions and to train them on their roles as a

rater. Each student team of one OT and one PA student participant was instructed to jointly interview a SP for approximately 20-30 minutes. More specifically, the PA student participants were expected to complete a basic medical history, and the OT student participants were expected to complete a basic occupational profile interview. After the interview with the SP, the OT and PA participants were given an additional 10-20 minutes to communicate with each other regarding the information gathered from the interview and to identify their joint recommendations for their SP. An additional 10-20 minutes was allotted for the OT and PA team to share their suggested therapeutic intervention(s) with the SP. Due to the COVID-19 pandemic, these interactions were virtual and recorded. At the conclusion of the interaction, the SP raters used the ICAR: Communication and Collaboration Dimensions to evaluate each student participant on the team. After all of the students' encounters with the SPs, faculty raters utilized the recordings to rate the student participants on the ICAR: Communication and Collaboration. Since many of the faculty participants were opening virtual rooms for the encounters and/or running focus groups, the use of the recorded encounters allowed all OT and PA raters to score every OT and PA student participant.

Data Collection and Analysis

A sequential explanatory mixed methods design was used for this study (Winston & Dirette, 2022). That is, this study began with the collection of quantitative data from the faculty/SP raters (ICAR: Communication and Collaboration Dimensions scores) and student participants (quantitative data from a researcher developed survey related to the student participants' perceptions of the IPE event). Then, qualitative data was collected via focus groups with SP and faculty raters regarding the utility of the ICAR: Communication and Collaboration. Additionally, focus groups were held with student participants to investigate their perceived value of this interprofessional experience. The intention of this mixed method design was to enhance rigor and to expand on the quantitative findings (Winston & Dirette, 2022). More specifically, all scores from faculty and SP raters were collected, inputted, and analyzed by the Statistical Package for the Social Sciences (SPSS) version 27. An interclass correlation coefficient (ICC) was used to examine the inter-rater reliability of the instrument for faculty raters and the SP raters. ICCs were calculated for each subscale (respect, strategies, collaborative, integration, and sharing) as well as overall for all raters (faculty and SP) and just faculty raters. Each ICC was calculated using a two-way random effects model for absolute agreement. The two-way random effects model was selected because the raters were randomly selected from a larger population of potential raters, and the results of the analysis are intended to be generalized to any raters (Koo & Li, 2016). Absolute agreement was selected for looking at systematic differences between raters compared to consistency in the context of repeated measurements by the same rater. Descriptive statistics in terms of means and standard deviations (SD) were calculated for each subscale and each rater. A 95% confidence interval (CI) was calculated for each ICC and p-values from the Analysis of Variance (ANOVA) models were used to determine significance. Significance level was determined to be alpha = 0.05. ICC values were interpreted according to the following criteria: below 0.5 = poor inter-rater reliability; 0.5 - 0.75 = moderate inter-rater reliability; 0.75 - 0.90 = good inter-rater reliability; and above 0.90 = excellent inter-rater reliability (Koo & Li, 2016).

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Quantitative and qualitative data were also collected regarding the student participants' perceptions and opinions related to this IPE opportunity. More specifically, a researcher-developed survey was used to gather both quantitative and qualitative data. The survey contained eight items on a 5-point Likert scale (1 = *Strongly Disagree;* 2 = *Disagree;* 3 = *Undecided;* 4 = *Agree*; and 5 = *Strongly Agree*) and one open-ended question: *Do you have any comments or suggestions that you would like to share?* The survey was completed on a voluntary basis and was provided immediately following the interprofessional experience with the SP. Summary statistics in terms of counts and percentages of the survey responses were calculated for each question. All open-ended survey responses were included in the Results section. Additionally, to obtain a deeper understanding regarding the perceived value of this type of IPE opportunity, all OT and PA student participants (n=19) engaged in a focus group immediately following this event to discuss their experiences during the interprofessional activity and their perceptions regarding the value and benefits related to these types of interprofessional learning opportunities. There were 2 different focus groups with students. One focus group consisted of 10 students (5 OT students and 5 PA students) and the other focus group consisted of 9 students (5 OT students and 4 PA students). Each student focus group lasted approximately 60-minutes and was led by one of the OT and one of the PA researchers. Please see Appendix A for a listing of the semi-structured questions used for the student focus groups.

Qualitative data was also gathered from the faculty and SP raters to assess the utility of the ICAR: Communication and Collaboration. More specifically, immediately after the IPE event, all SPs (n=5) participated in a focus group to investigate their perceptions of the efficiency and utility of this tool to evaluate the collaboration and communication of healthcare students. The focus group with SPs lasted approximately 60-minutes and was led by one of the OT and one of the PA researchers. Please see Appendix B for a listing of the semi-structured questions used for the SP focus group. Additionally, after all faculty (n=7) completed their ratings of the recorded interactions, they similarly participated in a 60-minute focus group to investigate their perceptions of the efficiency and utility of this tool. The faculty focus group was led by one of the PA researchers. Please see Appendix B for a listing of the semi-structured questions used for the faculty focus group.

All qualitative data from the focus groups were recorded and transcribed verbatim. Thematic analysis was used to analyze qualitative data (Creswell & Creswell, 2018; DeSantis & Ugarazza, 2000). All of the OT (n=4) and two of the PA researchers involved in this study individually immersed themselves in the data by "repeated reading" as a way to gain familiarity and to begin to find patterns (Braun & Clark, 2006). Next, the OT and PA researchers individually generated initial themes from the data. Then, the six OT/PA researchers met to identify patterns in the data, reduce and group qualitative data and identify themes. Revisions to themes were made until all researchers came to a consensus. To enhance the trustworthiness of the findings, peer

debriefing and expert review were used (Creswell & Creswell, 2018). More specifically, a researcher, not involved in the collection of data for this study, served as an expert and provided input during both the data collection and data analysis stages of this study.

Results

Quantitative Results Related to Inter-Rater Reliability

The results of the quantitative data analysis revealed that there was moderate inter-rater reliability when OT and PA faculty scores (n=7) were analyzed together (ICC range from 0.541 to 0.629), across four out of five subscales: respectful communication, collaborative relationships, integration of information from others, and information sharing. Moderate inter-rater reliability was determined as well when OT and PA faculty scores (n=7) were combined with the SPs' scores (n=5) for the same four out of five subscales (respectful communication, collaborative relationships, integration of information from others, and information sharing) with ICCs ranging between 0.524 to 0.703. The communication strategies subscale demonstrated poor inter-rater reliability when all raters (faculty and SPs, ICC = 0.301) and just faculty raters (ICC = 0.247) were assessed. Please refer to Table 1 which provides the results of interclass correlation coefficient (ICC) analysis and Table 2 which illustrates the descriptive statistics for each rater for each subscale.

Table 1

Results of Interclass Correlation Coefficient (ICC) Analysis

Subscales	Number of items	All Raters Faculty (n=7) and SP (n=5)		Just Faculty Raters (n=7)	
		ICC (95%CI)	p-value	ICC (95% CI)	p-value
Respect	3	0.563 (0.339, 0.736)	<0.001	0.684 (0.513, 0.811)	<.001
Strategies	3	0.301 (0.030, 0.528)	0.016	0.247 (-0.054, 0.494)	.050
Collaborative	1	0.586 (0.275, 0.850)	0.001	0.665 (0.402, 0.845)	<.001
Integration	1	0.541 (0.203, 0.783)	0.002	0.524 (0.175, 0.775)	.003
Sharing	2	0.629 (0.422, 0.785)	<0.001	0.703 (0.541, 0.823)	<.001
Overall	10	0.532 (0.422, 0.629)	<0.001	0.599 (0.502, 0.683)	<.001

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Table 2

Descriptive Statistics by Rater and Subscale

Rater ID	Rater	Collaboration		Integration		Respect		Strategies		Sharing	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
OT 1	Rater 1	2.95	.510	2.80	.410	2.85	.580	2.83	.461	2.89	.575
OT 2	Rater 2	3.20	.696	3.30	.657	3.18	.747	3.12	.697	3.28	.659
OT 3	Rater 3	2.65	.489	2.85	.745	2.88	.648	2.66	.710	3.00	.632
OT 4	Rater 4	3.10	.718	3.20	.696	3.45	.639	3.20	.581	3.25	.692
PA 1	Rater 5	2.80	.768	3.10	.641	3.18	.549	2.90	.578	2.97	.560
PA2	Rater 6	2.95	.759	3.05	.394	3.18	.675	2.86	.472	2.86	.543
PA 3	Rater 7	3.50	.827	3.65	.671	3.40	.672	3.14	.753	3.25	1.025
All SPs	n=5	3.40	.681	3.35	.671	3.43	.712	3.39	.670	3.39	.803

Quantitative Results Related to Student Participants' Perceptions of the IPE Event
Fifty-three percent of the students (n=10) completed the survey. Almost all student participants agreed or strongly agreed with the eight questions related to the value, benefits, and their satisfaction regarding the interprofessional event (see Table 3).

Responses to the open-ended question on the student participant survey (Do you have any comments or suggestions that you would like to share?) were as follows: (1) "*This activity was very useful because healthcare is becoming more interprofessional and requires providers to collaborate with each other to help a patient's overall health. This encounter gave me another opportunity to practice that collaboration with a different healthcare professional (OT) and allowed me to better understand their focus when it comes to helping patients … I think I will be a better practitioner.";* (2) "*I thought this was a very valuable experience!*"; (3) "*I really liked this activity! I think it would be very beneficial to do these with students from all different programs … it was very helpful.*"; (4) *More opportunities with other branches of medicine are always appreciated!*"; and (5) "*This was a cool experience! I really appreciated the opportunity to create a plan together and share it with our patient.*"

Table 3

Students' Perceptions Regarding the Interprofessional Event

Item	Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
		n (%)	n (%)	n (%)	n (%)	n (%)
1	This interprofessional activity was a valuable experience.	0 (0)	0 (0)	0 (0)	3 (30)	7 (70)
2	This interprofessional activity enhanced my understanding of the PA/OT profession.	0 (0)	0 (0)	1 (10)	5 (50)	4 (40)
3	This activity enhanced my interprofessional communication skills.	0 (0)	0 (0)	1 (10)	6 (60)	3 (30)
4	This activity enhanced my ability to collaborate with other healthcare professionals.	0 (0)	0 (0)	1 (10)	6 (60)	3 (30)
5	Following this activity, I feel more comfortable with my ability to communicate and colaborate with another healthcare profesional.	0 (0)	0 (0)	0 (0)	7 (70)	3 (30)
6	I was able to learn something new from this event.	0 (0)	0 (0)	0 (0)	6 (60)	4 (40)
7	I would recommend a similar event like this to a fellow student.	0 (0)	0 (0)	1 (10)	3 (30)	6 (60)
8	Overall, I was satisfied with this event.	0 (0)	0 (0)	1 (10)	5 (50)	4 (40)

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Qualitative Results

Faculty and Standardized Patients' Perceptions Regarding Utility of ICAR: Communication and Collaboration

Results of the qualitative data from the ICAR: Communication and Collaboration Dimensions raters revealed three major themes: (1) the ICAR: Communication and Collaboration Dimensions is a practical and efficient tool; (2) more in-depth training prior to the use of the ICAR: Communication and Collaboration Dimensions would enhance efficiency, reliability, and clarity; and (3) modifications would enhance the accuracy and reliability of the ICAR: Communication and Collaboration Dimensions tool.

The ICAR: Communication and Collaboration Dimensions is a Practical and Efficient Tool. Both the faculty and SP raters expressed that the ICAR: Communication and Collaboration Dimensions was easy to use and took minimal time to complete. In fact, all raters expressed that it seemed very practical and efficient. Furthermore, the majority of the raters voiced that the instrument had enough items to thoroughly assess interprofessional communication and collaboration.

Additionally, the majority of the raters, who have traditionally assessed students' communication and collaboration skills on an informal basis, overwhelmingly expressed appreciation for the fact that the ICAR: Communication and Collaboration Dimensions contained a rubric and that they were able to assess the students' communication and collaboration skills more formally. They felt the use of this rubric-based tool would help ensure consistency and relevance when grading students and providing feedback on interprofessional communication and collaboration experiences. Thus, the raters believed the ICAR: Communication and Collaboration Dimensions could be used by a variety of raters (faculty, SPs, clinical instructors, etc.) and may be an advantageous tool, especially when the SPs are involved in various classroom activities/examinations in which they are expected to provide feedback regarding the students' communication skills.

Training Raters Prior to the Use of the ICAR: Communication and Collaboration Dimensions Would Enhance Efficiency, Reliability, and Clarity. Raters expressed there was a learning curve to the use and scoring of the ICAR: Communication and Collaboration Dimensions and indicated that if there was a more in-depth training session on the use of the tool, before the utilization of the tool, that it might help improve confidence and consistency with scoring. Even though the raters indicated that the ICAR: Communication and Collaboration Dimensions was efficient and easy to use, many of the raters indicated that it became easier and more efficient with increased usage of the tool. As with the use of most assessment tools, the raters expressed that they felt more competent with the tool and that their own individual scores became more consistent over time with increased use of the tool.
However, concerns were expressed about the clarity of definitions provided in the ICAR rubric. For example, under the dimension *Respectful Communication, mastery* is indicated when the student *consistently communicates with others in a confident, assertive, **and** respectful manner*. Uncertainty with scoring arose because some

students were respectful, but not confident and/or assertive. Likewise, the SP raters, in particular, expressed a desire for further clarification regarding the ICAR dimensions entitled *Information Sharing* and *Respectful Communication.* More specifically, under *Information Sharing*, they were unsure if the score was related to the OT and PA student sharing information with each other, the patient, or asking permission to share information with their colleagues. Likewise, under *Respectful Communication*, they were unsure about how to define "in a timely manner." Thus, raters communicated that if additional instruction and guidance were provided in a training session at least two days prior to its usage, that there might be more consistency in the scoring, and would help enhance comfort, familiarity, and efficiency with the use of the ICAR: Communication and Collaboration.

Modifications Would Enhance Accuracy and Reliability of the ICAR: Communication and Collaboration Dimensions Tool. Since the raters expressed uncertainty regarding scoring a few of the items on the rubric, in addition to more in-depth training on the use of the ICAR: Communication and Collaboration Dimensions before the implementation of this assessment tool, suggestions were also made to modify the rubric for additional accuracy and/or clarity. For example, for the first item under *Respectful Communication,* recommendations were made to either revise the rubric so that each of the listed skills (confidence, assertiveness, and respect) were listed as individual items or that the rubric be revised to reflect percentages of the skill (e.g., student exemplified one of the three, two of three, or all three of these skills (confidence, assertiveness, and respect).

Other suggestions to improve the ICAR: Communication and Collaboration Dimensions included the provision of a user's manual, which could provide a more detailed description for each of the items and/or examples of scoring. Some raters believed that the creation of a user's manual would be advantageous and might enhance comfort, clarity, and consistency with scoring. Lastly, the SP raters also suggested that it would be advantageous if the ICAR: Communication and Collaboration Dimensions specifically assessed something related to empathy.

Students' Perceptions Regarding the Interprofessional Experience

Three themes emerged from the qualitative data from the student participants: (1) Students recognized the value and benefits of interprofessional experiences; (2) Some challenges were experienced related to the interprofessional event occurring virtually; and (3) Timing and length of extracurricular IPE events may greatly influence attendance.

Students Recognized the Value and Benefits of Interprofessional Experiences. All student participants in the focus group expressed appreciation for having a supplemental opportunity to participate in a mock patient encounter with another healthcare professional and indicated that this was their primary reason for volunteering to participate in this research study.

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The student participants stated that these types of experiences also helped them get a better understanding of the role of another healthcare professional. For example, one student participant stated: "*I was particularly interested in meeting students from a different profession … I saw it as an opportunity to bring in the unique role of OT … so maybe the physician assistants can see what OT actually can do for them and their patients."* They also expressed appreciation for having the opportunity to observe the other professional interview the patient and provide recommendations for intervention. For instance, one student participant exclaimed: "*It is super nice to know about another profession and what they specialize in and what kind of questions they tend to ask … I feel like it was good experience for the future."* By observing the other professional's interactions with a SP, the students expressed that they are now, not only able to better understand and explain the role of the other professional, but they developed an appreciation and heightened level of respect for the other professional's areas of expertise. For example, one student participant said: "*I definitely got new information … more respect for the OT profession … even in the short amount of time that we did this patient encounter … it helped getting to know their thought process and to compare it to mine."* Thus, the student participants believed that these types of experiences would help them make referrals to other specialists in the future.

Many of the student participants indicated these types of opportunities are extremely valuable and can enhance learning and skills in ways that readings, class discussions, and other learning activities cannot capture. For instance, one student participant expressed:

> *It was a really good learning experience … we can complete all the readings and learning modules … but the real experience comes when we're able to talk and interact with the patients and understand what our strengths and weaknesses are … that doesn't happen in many of our other assignments.*

Similarly, another student participant exclaimed*:*

> *We've already had some encounters with SPs … but this one allowed us to learn how to work with another healthcare professional while seeing a patient at the same time and asking questions together, I think it's a really important skill to learn … you can't develop that type of skill by sitting in class."*

Student participants stated they liked the fact that this interaction was with only one other future healthcare professional versus many healthcare students working together with a SP. Because the student participants in this study were first year OT and PA students, they expressed that this encounter was more conducive to their comfort and skill level at this point in their curriculum; however, they indicated that as they gained more knowledge and skills, they would feel more ready to participate in encounters with multiple healthcare students. For example, one student participant stated:

> *We had that IPE class earlier in our program … we had an activity with five of us [healthcare students] and one [standardized] patient, and it was a little, to be perfectly honest, a little clumsy … it was too much for where we were at in our studies. We had trouble figuring out how to collaborate … when I saw this [IPE opportunity] with only one other member of the healthcare team … I thought*

> *that's going to be such a cool experience where we're really going to be able to collaborate, especially when the opportunity was to share a plan with the patient … to have to come up with a plan together … I thought it might give me what I was hoping to get out of the other experience … that was an appeal for me*."

The majority of the student participants overwhelmingly expressed the multiple benefits of such encounters and indicated that they helped improve their comfort, confidence, and clinical skills. For example, one student participant said, "*It was a good way to get experience…I get nervous with patient encounters…the more practice I get, the more comfortable I get."* And another student participant stated, "*I felt my own confidence grow talking to another professional … when she would mention something that would connect a dot for me … it filled in some of the gaps which ended up raising my own confidence in my knowledge."*

Most of the students claimed this interprofessional encounter helped them think in the moment and develop their clinical reasoning skills. The students appreciated the spontaneity of this experience. They felt it would help them in future practice when they might have an interprofessional encounter with a patient and need to identify a plan without having the opportunity to talk to the other professional or patient privately. They also thought the spontaneity of this experience helped foster their ability to think, listen, and respond in the moment, a skill that is hard to develop in traditional teaching and learning activities. For example, one student participant stated, *"I think clinical practice entails a lot of thinking in the moment and this opportunity definitely did … I think it was an excellent opportunity to enhance my clinical reasoning skills and my ability to just think in the moment."*

They also reported that these types of opportunities allowed them to feel more comfortable interacting with other healthcare professionals. Moreover, they shared that these types of experiences were extremely advantageous for future practice. They asserted that being able to practice interprofessional communication and collaboration skills without a grade being attached to their performance was highly beneficial as they felt they were better able to think in the moment, reflect, and grow from this experience because they felt less nervous. For instance, one student participant stated:

> *I do think that it was a more positive collaborative experience for me because there was no grade attached … to have the same goal which was more patient focused … made it a more beneficial experience in collaboration … it stood apart from some of the other things that we've done …the opportunity to do it without being graded and being really nervous, allowed me to just focus more on talking and my skills.*

They stated this opportunity facilitated self-reflection and identification of things they would like to work on and refine before real patient encounters in fieldwork, on clinical rotations, and in clinical practice. For example, one student participant exclaimed:

> *I think the more patient experiences the better in my opinion…I think it's just so different learning about something and then practicing your skills and so I feel*

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> *like every time I do another patient encounter, I find something else I have to work on, like oh, I shouldn't have gone in that order, or I should have said this better.*

Some Challenges Were Experienced Related to the Interprofessional Event Occurring Virtually. Although the students' comments were overwhelmingly positive, they discussed several challenges related to this experience, as well. Because this was a virtual event, students wished they had a few minutes to introduce themselves to the other healthcare professional before they were "put in a room" with the SP and required to interview the patient. They felt if they had a few minutes with the OT/PA student prior to the patient encounter that it may have helped them manage their time more effectively, and it may have helped regarding the overall efficiency of the encounter with the SP. For example, several students indicated that a little time for the two disciplines to meet prior to the session would have provided time to establish who was going to begin the interview with the patient, what order/sequencing of questions they would follow, and the encounter would have been more refined, smoother, and less awkward. For instance, one student participant expressed,

> *In the beginning, I was kind of asking a question and he was asking a question, but I think now that I'm looking back at it, maybe it didn't make the most sense or was the most effective strategy. We did get the information we needed, but I think it could have been smoother … I think meeting ahead of time would have made it a little smoother, but it was probably a good growing experience though, because we had to kind of just figure it out without meeting ahead of time. Which like, it's a little more realistic that way 'cause you don't always get to meet the other person, so it worked out.*

Student participants also reported that some challenges arose due to the virtual format (e.g., computer screen freezing, problems with the microphone, and background noise), but they indicated these were few and short-lived. However, some students indicated they did not see some of the background information/patient's history, which was provided electronically ahead of time; thus, a couple of the students felt uncomfortable and/or not as prepared for the encounter as they would have desired.

Timing and Length of Extracurricular IPE Events May Greatly Influence Attendance. Overall, the students felt that the timing of the event was ideal. They appreciated that the event was at the beginning of the academic quarter (week two). Students indicated that if this extracurricular interprofessional opportunity was held closer to midterms, finals, and/or due dates for larger assignments that they may not have participated in this event. Most students expressed that the length of the event (one hour) was perfect, but one student participant suggested that a 30-minute encounter might be better received in terms of recruitment and participation in such events. Students appreciated that this event was offered during the week and held approximately one hour after their regularly scheduled classes. They expressed that if this IPE opportunity was scheduled on the weekend that it might negatively impact

student recruitment and participation. Finally, student participants recommended that it might be advantageous to offer these types of experiences on two different dates, perhaps one during the week and one on the weekend or both on two different weekdays.

Discussion

The results of this study appear to support the findings of Hayward and colleagues (2014) that a shortened and modified version of the ICAR has the potential to be a reliable measure of interprofessional communication and collaboration. Similar to Hayward et al. (2014), this study also suggested that a shortened version of the ICAR has the potential to be reliably used with a variety of raters. Inter-rater reliability among healthcare professionals and SPs is important because numerous medical schools and allied health programs utilize SPs to not only portray various patient roles for teaching/learning opportunities and/or examination purposes, but they are often trained and expected to give feedback to medical and healthcare students on their interpersonal communication skills.

The results of this pilot study may suggest that each dimension of the ICAR can be assessed separately without severely degrading the inter-rater reliability of the instrument, as there was moderate inter-rater reliability among faculty, and among SPs when compared to faculty scores, across four out of five subscales. Interestingly, in the Hayward (2014) study, they found that female raters scored residents significantly lower than male raters. Because of the relatively low number of raters in this study overall (n=12) and the fact that there were only a few male raters in this study (n=4), and since the ratio of female to male faculty and SPs in this study (75% female: 25% male) grossly represented the population of female/male OT and PA faculty and SPs at this university, as well as the current demographics in OT/PA professional practice, the researchers of this study did not investigate any differences between male and female raters. However, future research may want to consider that type of statistical analysis, especially since there is evidence of differences in the Hayward (2014) study. Additionally, the results of this study support the work of Keshmiri and colleagues (2016) that a modified version of the ICAR has the potential to be reliably used with healthcare students in simulated cases as opposed to rating medical professionals in the field.

Even though four out of five subscales demonstrated moderate inter-rater reliability, the subscale entitled *communication strategies* showed poor inter-rater reliability. Mastery on *Communication Strategies* is designated as: (1) consistently uses communication strategies (verbal and non-verbal) appropriately in a variety of situations; (2) consistently communicates in a logical and structured manner; and (3) consistently explains discipline-specific terminology/jargon. Although the researchers can only speculate why this subscale lacked inter-rater reliability, it is possible that some of the limitations of this study impacted the inter-rater reliability for the above-mentioned subscale. For example, while there are many benefits to providing virtual interprofessional opportunities, there are limitations as well. One notable limitation was that the OT and PA students did not interact prior to entering the “virtual” exam room.

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Had the event been held in person, students likely would have interacted while waiting for the event to begin and before entering the exam room. Thus, students probably would have taken a few minutes to create their “game plan” prior to their encounter with the SP. Students expressed that if they had the opportunity to meet ahead of time, it may have enhanced the quality of their communication and collaboration skills. Although the spontaneity of the event was identified as beneficial, it may also have minimized their ability to develop effective communication strategies. Furthermore, it is possible that the situation impacted their ability to “consistently communicates in a logical and structured manner.” Moreover, because faculty raters were aware of this nuance, it is possible that the faculty raters had varying expectations and rated differently due to the circumstances of this virtual IPE event. Thus, it is recommended that future virtual interprofessional encounters allow some time for the students to meet together prior to entering the virtual exam room. Another limitation of this study is that it had a small sample size, and only involved OT and PA student participants. Thus, future studies are recommended with a larger sample size of raters and with student participants from more diverse healthcare programs.

The Accreditation Council for Occupational Therapy Education (ACOTE®; 2018) mandates that all OT academic programs meet certain standards related to IPE such as provision of educational opportunities to develop effective communication with members of the interprofessional team, using a team-based approach to promote health and wellness, as well as the ability to understand interprofessional team dynamics, and the ability to effectively perform different team roles to plan, deliver, and evaluate patient- and population-centered care. Similarly, the Accreditation Review Commission on Education for the Physician Assistant Standards (2020) requires PA Programs to prepare PA students to work on collaborative teams in an interprofessional environment. Furthermore, the Physician Assistant Education Association (PAEA) Core Competencies for New Physician Assistant Graduates (2019) consist of six domains, one of which is interprofessional collaborative practice and leadership. The PAEA (2022) recognizes that team-based care is essential to both the professional identity of Physician Assistants and providing effective patient-centered care. Even though this study was related to an IPE event with OT and PA students, future studies may want to assess the inter-rater reliability of the ICAR: Communication and Collaboration Dimensions with other healthcare student participants (e.g., PT, SLP, Psych, etc.), as these disciplines are part of IPEC and also have to meet accreditation standards related to IPE. However, even though IPE is a mandated component of many medical and allied health professional academic programs, there are many logistical barriers to the provision and implementation of IPE opportunities into existing curricula (Knecht-Sabres et al., 2016). Thus, the provision of optional and extracurricular IPE opportunities such as the encounter utilized in this study might be a way to provide additional IPE opportunities for interested health professional students when logistical challenges (e.g., lack of shared meeting spaces, rigid curricula, incongruent class schedules, etc.) interfere with the offering of these types of experiences.

Even though all students at this university partake in mandatory IPE courses, interprofessional communication and collaboration skills were not formally assessed during the IPE encounters. Thus, the researchers of this study primarily wanted to pilot the use of ICAR: Communication and Collaboration Dimensions for its potential use in the future. Additionally, since students at this university have traditionally expressed the desire for more interprofessional experiences and additional opportunities to practice skills with SPs, the researchers of this study inquired about the student participants' perspectives regarding these types of events. The student participants in this study indicated they were highly interested in participating in interprofessional opportunities, even if these events occurred outside of their typical class schedules and were offered without additional incentives. Even so, as suggested by the student participants, individuals responsible for organizing and hosting interprofessional educational events should ensure that these events are provided at times that are convenient for the students (e.g., at the beginning of the academic quarter/semester when academic demands and stress levels are lower, during the week, shortly after their last class of the day, and that the event lasts for approximately 30-60 minutes, which was identified as a reasonable amount of time by the participants). Additionally, faculty responsible for implementing IPE learning activities should consider offering these opportunities without a grade attached to the students' performance as the participants in this study articulated that this fact helped maximize their learning.

The researchers of this study also recommend assessing if inter-rater reliability of the ICAR: Communication and Collaboration Dimensions improves, if longer exposure to the scoring rubric (i.e., one week before the event), especially for non-medical raters such as SPs, is provided, and if a longer and/or more thorough training session on the use the tool is offered before making any adjustments or modifications to the ICAR: Communication and Collaboration. Even though Hayward and colleagues (2014) modified the original ICAR to include a nine-point scoring schema (instead of the original four-point scale) to provide better delineation of skills, the researchers of this study appreciated the fact that the ICAR rubric seems to thoroughly assess communication and collaboration skills in a timely and efficient manner. Therefore, these researchers are concerned that if any modifications were made to the existing rubric (e.g., allowing for more discrimination in scoring) that it might jeopardize the efficiency of this tool. Lastly, since the SP raters in this study were highly accustomed to providing feedback to students related to humanistic characteristics of student/SP encounters (i.e., empathy), the SP raters in this study were concerned that the ICAR: Communication and Collaboration Dimensions did not include this aspect of communication and collaboration. The reader should note that the original (31-item) ICAR does contain dimensions called *Respect for Different Perspectives* and *Active Listening,* in which students are rated on their ability to seek perspectives and opinions of others as well as the use of active listening skills. Thus, one always needs to consider the pros and cons of condensing existing tools with known reliability and validity.

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As previously discussed, the original intention of this interprofessional opportunity was to provide this experience in-person. Even though this event was offered virtually, it was still viewed as being highly valuable and beneficial by the students. However, the researchers in this study recognized that adjustments can always be made to improve the quality of such learning opportunities. For example, one lesson learned from this endeavor would be to allow the interprofessional team (OT and PA students) to have a few minutes alone in a virtual room before they enter the virtual room with the SP. Additionally, if a faculty member was also in that virtual room before the interprofessional team introduced themselves to the SP, the faculty member could have ensured that the students located/saw all of the provided information and materials (e.g., the "door chart" with the patient's background information).

Lastly, true to a mixed methods study, the multiple forms of data were compared. The results of both the qualitative and quantitative data from the student participants mirrored each other and resoundingly indicated that the students highly valued this interprofessional learning opportunity and identified numerous ways that it enhanced their learning and clinical skills.

Conclusion

The results of this study suggest that the ICAR: Communication and Collaboration Dimensions has the potential to maintain inter-rater reliability to assess interprofessional communication and collaboration among healthcare students. Raters indicated the use of the ICAR: Communication and Collaboration Dimensions was practical and efficient when assessing healthcare student communication and collaboration. The addition of rater training sessions prior to the use of this tool may improve rater consistency. The results of this study also indicated that healthcare students viewed interprofessional educational events as being highly valuable and beneficial. Above and beyond assessing and enhancing communication and collaboration skills, IPE events such as this can help students become ready for collaborative practice, enhance other professionals' knowledge regarding the value of OT services, strengthen students' ability to communicate with clients and other members of the healthcare team, as well as improve patient and client outcomes, satisfaction, and comprehensive care.

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Appendix A

Examples of Focus Group Questions for Student Participants

I. Why did you decide to participate in this study?

2. What was the most beneficial aspect of this interprofessional opportunity?

3. Do you feel you are more comfortable interacting with other healthcare professionals as a result of this event?

4. What challenges did you experience during this interprofessional opportunity?

5. Did you feel the time commitment was reasonable?

6. Was the time of the event convenient for you? Would you prefer an alternate time?

7. Was the gift card an incentive to participate in this study?

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Appendix B

Examples of Focus Group Questions for Faculty and SPs

I. What are your general impressions of using the modified ICAR?

2. Do you feel this tool captured the important aspects of communication and collaboration from students involved in an interprofessional simulated clinical experience?

3. If not, what aspects of communication and/or collaboration need to be included?

4. How easy did you feel this form was to use?

5. Do you feel this form would be practical to use when assessing communication and collaboration in students from different health care disciplines during simulated patient encounters?

6. Is there anything about this form that you would change?

7. Do you have any other comments or suggestions about the modified ICAR?