1

Connecting Clinical and Foundational Sciences in Interprofessional Small Groups

Jubilee Hou, OMS III
Cali J. Bills, OMS IV
Andrew W. Mannisto, OMS IV
Martin Schmidt, Ph.D.
Des Moines University

2

Disclosure

I do not have any financial relationships with ineligible companies to disclose.

3

3

Introduction

- DMU has been advancing small group learning through an integrated activity in which students work through patient cases with the objective of recognizing the connections between basic science principles and clinical presentations.
- During SKIPPs (Scientific Knowledge Integrated in Patient Presentations) sessions, students work through a low-fidelity text-based simulation, present the patient to their "attending", and explore the relevant literature on the patient's condition.
- **Goal:** To establish the educational benefits of SKIPPs sessions in mixed groups of PA and DO students, who each might bring a different perspective on foundational sciences to the discussion.

4

4

Methods – Design of Activity

120 minutes	Preparation: Independent review of Inborn Errors of Metabolism (Foundational Science course), formative quiz for readiness			
30 minutes	Case 1 (group of 6) Patient presentation Differential diagnoses Diagnostic strategy Discussion of lab values	Case 2 (group of 6) Patient presentation Differential diagnoses Diagnostic strategy Discussion of lab values	Case 3 (group of 6) Patient presentation Differential diagnoses Diagnostic strategy Discussion of lab values	Case 4 (group of 6) Patient presentation Differential diagnoses Diagnostic strategy Discussion of lab
20 minutes	Oral presentations to large group: Patient presentation, differential diagnoses, clinical reasoning strategies (1 student per group, 5 minutes per case)			
20 minutes	Case 1 (group of 6) Literature study Discussion of foundational science principles related top presentation and treatment	Case 2 (group of 6) Literature study Discussion of foundational science principles related top presentation and treatment	Case 3 (group of 6) Literature study Discussion of foundational science principles related top presentation and treatment	Case 4 (group of 6) Literature study Discussion of foundational science principles related top presentation and treatment
20 minutes	Large group debriefing: Integration of foundational and clinical sciences, practical aspects of IEM diagnosis and patient care			

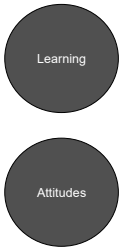
Image Dall-e

5

5

Methods – Data Collection and Analysis

Data Collection: Surveys



Data Analysis: Statistical Methods

- Test of Normality (Shapiro-Wilk)
- Pre/Post SKIPPs Session Comparisons
- Nonparametric Tests (Mann-Whitney U), Effect Sizes (Cliff's Delta)

6

6

Results and Discussion

Outcomes: Individual Skills (Pre/Post Comparison)

	DO Pre (394)	DO Post (445)	Significance	Effect Size	PA Pre (17)	PA Post (15)	Significance	Effect Size
Teamworking skills.	4.3±0.8	4.7±0.9	<0.001	0.12	4±0.5	4.5±0.5	0.009	0.29
Clinical problem-solving skills	3.3±1	4±1	<0.001	0.20	3.7±0.7	4±0.8	0.062	0.23
Utilizing foundational science knowledge	3.6±1	4.2±0.9	<0.001	0.20	3.5±0.5	4±0.5	0.012	0.28

large	>0.5
medium	>0.3
Small	>0.1

7

7

Results and Discussion

Outcomes: Group Differences (Post-SKIPPs)

	All Students by Group				DO Students Only by Group			
	DO Group	DO/PA Group	Significance	Effect Size	DO Group	DO/PA Group	Significance	Effect Size
Please rate your teamworking skills.	4.4±1	4.6±0.6	0.830	0.090	4.4±1	4.8±0.5	0.0468	0.1060
Please rate your clinical problem-solving skills.	4±1.1	3.9±0.9	0.849	0.064	4±1.1	4.1±1.3	0.4819	0.0649
Please rate your skills in utilizing foundational science knowledge	4.1±0.8	4±0.6	0.837	0.046	4.1±0.8	4±0.6	0.9999	0.0255
Please rate your group's teamworking skills.	5±0.9	4.8±0.4	0.042	0.103	5±0.9	5±0.2	0.0038	0.1370
Please rate your group's clinical problem-solving skills.	4.9±1.1	4.4±1	0.111	0.089	4.9±1.1	4.7±0.8	0.0610	0.1022
Please rate your group's skills in utilizing foundational science knowledge	4.7±0.7	4.5±0.7	0.140	0.086	4.7±0.7	5±0.6	0.0902	0.0963

8

8

Results and Discussion

Post-SKIPPs Attitudes Survey

	DO (N=96)	PA (N-35)	p (Mann Whitney)	r (Effect)
As a health professions student….				
I am confident in my understanding of the role of my profession on an IP team.	4.5±1	4.6±1	0.933	0.007
I am able to communicate with other health professional learners.	5±0.8	4.9±0.5	0.593	0.047
I am able to understand the roles of other professions on an IP team.	4.1±0.9	4.5±0.9	0.003	0.264
I am dependent on the skills and knowledge of other health professional learners.	4.3±1.6	4±1.3	0.288	0.093
I identify with the team as a group.	4.7±0.9	4.4±0.8	0.050	0.171
I feel…				
Comfortable with other interprofessional team members	4.9±0.9	4.5±0.8	0.119	0.136
Other professionals play important roles on the team	5±0.5	4.9±0.3	0.857	0.016
I can cooperate with other interprofessional team members	5±0.6	4.9±0.3	0.796	0.023
Other interprofessional team members help shape my perception of the task/problem	4.9±1	4.8±0.8	0.899	0.011
More effective decisions are made by the group as a whole	5±0.9	4.9±0.4	0.362	0.080
Interprofessional teams are efficient	4.7±1	4.9±0.6	0.209	0.110

9

9

Conclusions

- DO and PA students report significant improvements in:
  - Teamworking skills
  - Clinical reasoning
  - Ability to integrate foundational sciences into clinical cases
- DO-only and DO/PA groups are not significantly different in attitudes surveys and largely not significantly different in learning outcomes.
  - Need to add information on PA scope of practice

Image Dall-e

10

10

Acknowledgements

- PA-S Participants, Dr. Holland Taylor, DMSc, PA-C
- DO Student Participants
- Gia Paris
- Dr. Martin Schmidt, Ph.D.

11

11

References

- Blue AV, Mitcham M, Smith T, Raymond J, Greenberg R. Changing the future of health professions: embedding interprofessional education within an academic health center. Acad Med. 2010;85(8):1290-1295. 10.1097/ACM.0b013e3181e53e07
- Hammick M, Olckers L, Campion-Smith C. Learning in interprofessional teams: AMEE Guide no 38. Medical Teacher. 2009;31(1):1-12. 10.1080/01421590802585561
- Schmidt M, Pinney B, Canby C, Vargus A, Pille M. An early-curricular team learning activity to foster integration of biochemical concepts and clinical sciences in undergraduate medical education. Biochemistry and Molecular Biology Education. 2024;n/a(n/a). https://doi.org/10.1002/bmb.21821
- Willetts G, Lazarus M. Professional Silos or Professional Integration? Exploring the role of the basic science disciplines in healthcare professionals' professional identities. MedEdPublish. 2018;7. 10.15694/mep.2018.0000241.1

12

12


Heartland Innovations in Interprofessional Practice and Education Summit • July 17-18, 2025
ONLINE
Transforming Futures:
Innovation and Disruption in Interprofessional Health Care and Education
DES MOINES UNIVERSITY
MEDICINE & HEALTH SCIENCES
Questions?

13