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Medical student preference for online or in-person clinical reasoning seminars and the role of gender

Victoria Scudamore, Sze Yi Beh, Adam Foster & Michaela Goodson

School of Medicine, Newcastle University Medicine Malaysia, Malaysia

Abstract

Introduction: This study compares online and in-person delivery of a weekly clinical reasoning seminar for fourth-year medical students at a Malaysian medical school. During the easing of COVID-19 pandemic restrictions, the initial eight seminars took place online, followed by eleven in-person seminars. This study looks at student preference for online or in-person delivery and how these reasons differ due to gender.

Methods: An online questionnaire was sent to fourth-year medical students after returning to in-person seminars. The response rate was 60/128 (46.88%) and the data was analysed using SPSS software.

Results: 65% of students preferred in-person seminars and a larger proportion of female students (71.43%) preferred in-person sessions compared to male students (50.00%), although this was not statistically significant ($p=0.11$). A significantly larger proportion of female students preferred in-person seminars for the following reasons compared to male students: enjoyment ($p=0.041$), developing history-taking skills (55.56%) and for formulating differential diagnoses ($p=0.046$). Students were asked whether online or in-person seminars were most appropriate for eighteen reasons, they felt in-person seminars were most appropriate for 16/18 of these reasons.

Conclusions: More students preferred in-person clinical reasoning seminars and a higher proportion of these students were female. A significantly larger proportion of female students felt in-person seminars were better for; enjoyment and for developing history-taking skills and formulating differential diagnoses, compared to male students. The students preferred online seminars for home comforts and ease of travel, but they preferred in-person seminars for the other 16/18 reasons listed including all reasons linked to learning skills and interacting with others.

Keywords: *Online Teaching, In-person Teaching, Gender, Clinical Reasoning, Medical Students*

I. INTRODUCTION

Fourth-year medical students at Newcastle Medical School Malaysia attend weekly clinical reasoning seminars as part of their 'Clinical Decision Making' (CDM) module. Each week of CDM covers a different medical speciality and students attend a seminar where the group works through a presentation with patient cases and they discuss how to diagnose, investigate and manage the patient. The sessions are attended by eleven students and the groups remain the same throughout the year. In 2021-22 the initial eight seminars took place online using Zoom video conferencing software and as

COVID-19 restrictions eased in Malaysia the final eleven sessions took place in-person.

The academic performance of students undertaking online and in-person clinical reasoning seminars has been researched and third-year medical student academic performance was comparable in both settings (Babenko et al., 2022). However, there is currently no research regarding medical student preference for online or in-person delivery of clinical reasoning seminars. Medical student preference for online or in-person delivery of all parts of the curriculum has been analysed and second-year medical students at a US medical school had a

preference for online lectures and there was a correlation between these students and those who felt online lectures reduced stress (Altaf et al., 2022).

A cohort study analysed participation in a teaching programme for US graduate physicians and this showed female students asked and answered less questions during in-person sessions compared to online sessions (Cromer et al., 2022). The results of this study are contrasting with my observations whereby female students participated less in online seminars and their participation increased when seminars returned to an in-person setting. This could be due to differences in the research environments or due to the group of observed students being small with less statistical significance.

My first research question was to understand medical student preference and reason for preference of online or in-person delivery of clinical reasoning seminars. My second research question was to establish if student preference differed due to gender and why.

II. METHODS

The data was collected using survey methodology with a self-developed questionnaire made using Microsoft forms. The questionnaire was emailed to all fourth-year medical students after they had experienced both session deliveries. Students were provided with a consent form and informed the research project was optional and were asked to provide voluntary consent before participating. Participants were informed they could withdraw from the project at any time up until the data was anonymised during data collection.

The survey response rate was 60/128 (46.88%), the low participation numbers are likely due to the data collection being optional and undertaken in the students own time. This could lead to a nonresponse bias, as it is likely the more engaged students participated and students with

less motivation who did not participate may have responded differently. The data was analysed using SPSS software. Chi-squared tests were used to cross-tabulate the results and to calculate p-values to indicate data with statistical significance.

III. RESULTS

Overall 65% of students preferred in-person seminars and 71.43% (30/42) of female students preferred in-person sessions compared to 50.00% (9/18) of male students ($p=0.11$). The students were asked if they felt online or in-person seminars were best for eighteen different reasons (see table 1). There were three statistically significant reasons female students preferred in-person sessions more than male students ($p<0.05$). These were Enjoyment ($p=0.041$), developing history-taking skills ($p=0.011$) and formulating differential diagnoses ($p=0.046$).

The students felt in-person sessions were most appropriate for 16/18 of the reasons listed in (table 1). The reasons with the highest proportion of students feeling in-person were the most appropriate were; interaction with friends (95.00%), interaction with the facilitator (91.67%), and developing clinical reasoning skills (91.67%). There were only two reasons students felt online sessions were most appropriate, these were home comforts (98.33%) and ease of travel (91.67%).

Original data can be accessed in Figshare at <https://doi.org/10.6084/m9.figshare.23616627.v1> and <https://doi.org/10.6084/m9.figshare.23616630.v1>

Results are ranked from reasons with the highest proportion of students thinking in-person was most appropriate for that reason. P-values have been calculated to establish if there is statistical significance between the results for male and female students, significant results are highlighted in bold.

	All students	Female students	Male students	P-value
Interaction with friends	57/60 (95.00%)	39/42 (92.86%)	18/18 (100.00%)	0.245 (>0.05)
Interaction with the facilitator	55/60 (91.67%)	39/42 (92.86%)	16/18 (88.89%)	0.610 (>0.05)
Developing clinical reasoning skills	55/60 (91.67%)	39/42 (92.86%)	16/18 (88.89%)	0.610 (>0.05)
Learning from the facilitator	51/60 (85.00%)	35/42 (83.33%)	16/18 (88.89%)	0.581 (>0.05)
Flow	47/60 (78.33%)	33/42 (78.57%)	14/18 (77.78%)	0.945 (>0.05)
Developing history-taking skills	46/60 (76.67%)	36/42 (85.71%)	10/18 (55.56%)	0.011 (<0.05)
Developing knowledge	45/60 (75.00%)	33/42 (78.57%)	12/18 (66.67%)	0.329 (>0.05)
Ease of sharing opinions	45/60 (75.00%)	33/42 (78.57%)	12/18 (66.67%)	0.329 (>0.05)
Enjoyment	44/60 (73.33%)	34/42 (80.95%)	10/18 (55.56%)	0.041 (<0.05)
Learning from peers	41/60 (68.33%)	28/42 (66.67%)	13/18 (72.22%)	0.672 (>0.05)
Formulating differential diagnoses	41/60 (68.33%)	32/42 (76.19%)	9/18 (50.00%)	0.046 (<0.05)
Interpreting clinical data	40/60 (66.67%)	29/42 (69.05%)	11/18 (61.11%)	0.550 (>0.05)
Formulating management plans	39/60 (65.00%)	29/42 (69.05%)	10/18 (55.56%)	0.315 (>0.05)
Better for mental health	36/60 (60.00%)	26/42 (61.90%)	10/18 (55.56%)	0.645 (>0.05)
Developing communication skills	35/60 (58.33%)	22/42 (52.38%)	13/18 (72.22%)	0.153 (>0.05)
Interpreting investigations	35/60 (58.33%)	27/42 (64.29%)	8/18 (44.44%)	0.153 (>0.05)
Ease of travel	5/60 (8.33%)	5/42 (11.90%)	0/18 (0.00%)	0.126 (>0.05)
Home comforts	1/60 (1.67%)	1/42 (2.38%)	0/18 (0.00%)	0.509 (>0.05)

Table 1. The proportion of medical students who felt in-person sessions were the most appropriate for the listed reasons.

IV. DISCUSSION

Overall, more students in our cohort preferred in-person clinical reasoning seminars and a larger proportion of these students were female than male, however, the difference in preference based on gender did not show statistical significance. This could be due to a smaller cohort of male respondents (18/60) compared to female respondents (42/60). However, even in a study of 488 medical and dental students there was no significant difference in preference for online or in-person delivery when asked about all sessions in the curriculum (Al-Azzam et al., 2020). A larger sample size of medical students will need to be analysed to establish if gender significantly influences student preference for online or in-person delivery of clinical reasoning seminars.

Students felt in-person seminars were better for 16/18 of the listed reasons. This included all reasons pertaining to interaction with other students and staff and all reasons regarding learning a variety of skills. The only two reasons students felt online sessions were better were ease of travel and home comforts. Therefore, this data suggests the only reasons the medical students preferred online seminars were due to the convenience of the

setting, and they felt the learning and interaction were superior in in-person seminars.

Of these eighteen reasons, three reasons showed a significant difference in response based on gender, with more female students preferring in-person seminars for the following reasons: enjoyment, development of history-taking skills and formulating differential diagnoses. History-taking and formulating differential diagnoses are more commonly undertaken by doctors within in-person environments. Therefore, female medical students may have a stronger preference for learning skills in the same setting they will be undertaken in when they are doctors.

This study helps to identify the components of clinical reasoning seminars male or female students prefer to undertake online or in-person. Future research could try to identify the reasons for these preferences and to establish if female students have a stronger preference for learning a skill in the same environment it would be undertaken in when they become a doctor.

This research will have most transferability to educators designing clinical reasoning modules to undergraduate students. It may also have some transferability to any undergraduate seminars and to postgraduate medical education. Also, understanding the environment each gender prefers to learn in and why, could help to designing future educational programmes. Especially if these programmes have previously shown differing participation or attainment based on gender.

V. CONCLUSION

In conclusion, students preferred in-person clinical reasoning seminars compared to online seminars and a higher percentage of female students preferred in-person compared to male students, although this was not statistically significant. Students had the strongest preference for in-person sessions due to interaction with friends and the facilitator and for developing clinical skills. Students had the strongest preference for online sessions due to home comforts and ease of travel. Female students preferred in-person seminars compared to male students for the following statistically significant reasons: enjoyment, developing history-taking skills and formulating differential diagnoses.

Notes on Contributors

Dr Victoria Scudamore was involved in data collection, data analysis and wrote this manuscript in full.

Dr Sze Yi Beh was involved in data collection and data analysis.

Dr Adam Foster was involved in data collection and data analysis.

Dr Michaela Goodson supervised and advised on data collection and analysis.

Ethical Approval

Research and ethics approval was granted by the research committee at Newcastle University Medicine Malaysia on 08/02/2022 (Approval number: 18547/2022).

Data Availability

The data used in this paper is available in the Figshare repository through the following links with associated DOI's <https://doi.org/10.6084/m9.figshare.23616627.v1> and <https://doi.org/10.6084/m9.figshare.23616630.v1>. The data is shared on the Figshare repository under the CC0 licence (no rights reserved) as there is no copywritten information included.

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Declaration of Interest

There are no potential conflicts of interest to declare.

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*Dr Victoria Scudamore
Newcastle University Medicine Malaysia
No. 1 Jalan Sarjana 1,
Kota Limu, EduCity@Iskandar,
Iskandar Puteri, Johor, Malaysia, 79200
Email: victoria.scudamore@nhs.net