

Widening Participation in Medicine: The Impact of Medical Student-led Conferences for Year 12 Pupils

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Research Article

Keywords: Widening Participation, Widening Access, Medicine, Medical Education, Student-led, Confidence

Posted Date: February 25th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-256692/v1>

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Abstract

Background

Individuals from deprived backgrounds are under-represented in the medical profession: confidence is a barrier to them successfully applying to medical school. Unfortunately, medical school widening participation (WP) initiatives to address this are limited by funding.

Methods

This study examined the impact of two student-led conferences that Year 12 pupils attended and presented at. It looked at the ability of the conferences to engage WP pupils, their impact on participant confidence, and the feasibility of them being replicated by other student-led groups. The first, Conference A, had more time and finances invested into it than the second, Conference B. The latter relied solely on university society funding, but utilised WP criteria for selection of participants. Participants identified their confidence in six areas on a ten-point scale, immediately before and after the intervention.

Results

A paired *t*-test showed a significant improvement ($p < 0.01$) in all areas of confidence for both conferences. Cohen's *d* showed Conference A had larger effect sizes in five out of six areas than Conference B.

Conclusion

This intervention has demonstrated a significant impact on participant confidence: a key factor to improve their chance of successful admission to medical school. This impact may be enhanced by supporting participants with their presentations prior to the conference; it is feasible for this work to be replicated by other student-led groups.

Background

The most under-represented group in medicine are those who come from lower socio-economic backgrounds (1). Widening participation (WP) aims to improve access to higher education for under-represented groups by providing support and opportunity (2).

Data from The Medical Schools Council Selection Alliance (MSCSA) revealed that only 14% of new medical students in 2015 were from lower socioeconomic groups (3). This is striking given that these groups represent 56% of the United Kingdom (UK) population (4). A 4-fold increase in the number of WP students is therefore required to ensure that doctors are representative of the community they serve.

Deprived areas struggle to recruit doctors (5). Medical students from lower socio-economic backgrounds often decide to work in these areas after graduating (6). Widening participation to medicine may therefore

improve health inequalities by addressing this recruitment issue.

Literature suggests that pupils from lower socioeconomic backgrounds are less likely to believe that they can study medicine, making them less likely to apply (7). This may be because they do not see themselves represented in the field, because they have no medical role models, and because of a lack in confidence in their abilities (8, 9).

WP initiatives give young people exposure to people from similar backgrounds who have overcome similar barriers to successfully gain a place at medical school (10). This provides medical role models to improve self-confidence and may result in more WP pupils successfully applying to medicine (11).

In 2016, the MSCSA proposed several initiatives to increase the amount of outreach work undertaken by medical schools. One proposal included holding regional conferences for pupils aspiring to study medicine. Privately operated events like this can cost pupils more than £300 to attend, making it inaccessible to pupils from lower socioeconomic backgrounds (12).

Funding for WP outreach work is a limitation for medical schools. Interviews with Deans at 25 medical schools in the UK highlighted that finances and staffing availability were a significant problem in the commissioning of WP work (13). To overcome barriers such as resource costs and staff time, the authors proposed that a student-led approach to WP work could be an effective and feasible option.

Medical students can successfully engage in 80 hours of WP work over the course of an academic year, alongside studying their full-time degree (14). They can also deliver large-scale events (15).

The authors have been part of Manchester Outreach Medics (MOMs), a university medical WP society. They discussed their student-led work in a recent article (16). Despite the success of their previous efforts in improving pupils' understanding in key areas, they had not addressed pupil confidence. They created a conference in 2017, at which Year 12 pupils delivered their own presentations, and this was replicated in 2018. To the authors' knowledge, this style of intervention was unique and has not been previously discussed in the literature.

This paper examines the first and second delivery of this conference, focusing on the robustness of participant selection, impact on their confidence, and the feasibility of other student groups replicating the conference.

Methods

Intervention Delivery

The first conference (Conference A) occurred in 2017, with funding of £4000 provided by The University of Manchester, Office for Fair Access and National Collaborative Outreach Programme. It was organised by BR (Ben Ryan) as part of a 12-week project in the Manchester Medical School Curriculum. It was a whole day event, beginning with lectures and a panel discussion on "life in healthcare". Pupils could then

choose to attend from a menu of workshops, including research, compassion in medicine, medical ethics, professionalism, public health, and holistic medicine. All pupils delivered their own presentations to a group of other participants and a panel of medical student volunteers. BR provided academic and pastoral support to pupils prior to the conference regarding their presentations.

The second conference, Conference B, was in 2018 and followed a similar format to Conference A. It was organised by CA (Charlotte Auty) during her fourth year of medical school alongside her full-time curriculum commitments. As a result, there was not capacity for CA to support each participant individually with their presentations. The budget was £800 and provided by The University of Manchester and Students' Union. The initial lecture and panel discussion were the same, but the workshops differed slightly: interview skills, empathy in medicine, medical ethics, professionalism, treating the patient as a person, and holistic medicine.

Participant Recruitment

The two conferences both invited sixth forms in Greater Manchester and Lancashire. Greater Manchester is a deprived area overall, with Manchester having one of the highest proportions of deprived neighbourhoods in England (17). Lancashire is a cold spot for medical WP work, with low levels of pupils admitted to medical school (12).

The two conferences differed in their recruitment of pupils. Conference A identified high-priority sixth forms using the Manchester Prioritisation Model (MPM). This tool identifies schools and sixth forms under-represented in higher education (18). High-priority sixth forms in Greater Manchester were invited first, followed by other sixth forms in Lancashire and Greater Manchester. 81 pupils attended Conference A, all delivering their own presentations.

Conference B had a more robust approach to pupil recruitment, using WP flags (Table 1). A WP flag is a particular demographic which is under-represented in the medical profession.

Table 1 - Demographics used as WP Flags

Attends a high priority school identified by MPM
Participant considers themselves to have a disability
Current or previous resident in local authority care
Lives in a high priority area identified by POLAR3
Eligible for free school meals
Parents did not attend university
Refugee or asylum seeker status

MPM = Manchester Prioritisation Model.

POLAR3 = Participation of Local Areas classification groups.

Pupils applied for Conference B through a secure, encrypted data collection platform named Bristol Online Surveys. All those who applied with at least one WP flag were automatically granted attendance. 104 pupils attended, with 48 delivering their own presentations.

Data Gathering

On arrival, participants were asked to complete an anonymised pre-conference ten-point questionnaire, highlighting their level of confidence in different areas. Zero equated to no confidence; ten equated to complete confidence.

Areas assessed for confidence included:

- Performing Medical Research
- Presenting at a Medical Conference
- Making a Positive Impact with my Career
- Being Able to Become a Doctor
- Public Speaking
- Overall Confidence

Immediately after the conferences, participants were asked to complete a post-conference questionnaire regarding their confidence in the same areas. Each participant's pre- and post-conference questionnaires were paired together, to allow for paired analysis of the data.

Data Analysis

The mean confidence levels for the areas were calculated for each of the conferences. If participants did not include both pre- and post-conference answers on an area, their data for that area was not utilised. The methodology used was consistent with the Declaration of Helsinki and participants provided informed consent to take part in this study. The University of Manchester's Ethics Decision Tool and The National Health Service Health Research Authority's Ethics Decision tool were used to confirm that ethical approval was not needed for this study. The questionnaires are available as a supplementary file.

A paired *t*-test assessed for a statistically significant difference in mean confidence levels between the pre- and post-conference data ($p < 0.05$).

Cohen's *d* calculated an effect size on the confidence levels. Effect sizes of greater than 0.8, 0.5, and 0.2 were considered large, medium, and small, respectively (19).

Effect sizes between Conference A and Conference B were compared to assess if there was any difference between the impact of the conferences on participant confidence.

Results

76 participants, out of the 81 who attended Conference A, completed both questionnaires. There was a statistically significant increase in confidence for all areas tested: two areas demonstrated a medium effect size in improvement; four areas demonstrated a large effect size. The most relevant areas for medical school applicants were overall confidence (Increase, 1.75; CI, 1.26-2.24; Effect Size, 0.90; $p < 0.01$) and being able to become a doctor (Increase, 1.41; CI, 0.92-1.90; Effect Size, 0.71; $p < 0.01$).

96 participants, out of the 104 who attended Conference B, completed both questionnaires. There was a statistically significant increase in confidence levels for all areas, with one area showing a small effect size, one area showing a medium effect size, and four areas showing a large effect size. The most relevant areas for medical school applicants were overall confidence (Increase, 1.50; CI, 1.02-1.98; Effect Size, 0.82; $p < 0.01$) and being able to become a doctor (Increase, 0.75; CI, 0.24-1.26, Effect Size, 0.41, $p < 0.01$).

Comparing the two conferences, Conference A had larger effect sizes than Conference B in five out of six areas. The results of both Conference A and B are displayed in Table 2.

Table 2 - Displays confidence data for both Conference A and Conference B

Area	A/B	n	Pre-Conference		Post-Conference		Increase in Mean (95% CI)	Effect Size	p-value
			Mean	SD	Mean	SD			
Performing Medical Research	A	74	5.32	2.32	7.11	2.44	1.78 (1.21-2.36)	0.75	<0.01
	B	95	4.68	2.45	6.81	2.47	2.13 (1.44-2.81)	0.87	<0.01
Presenting at a Medical Conference	A	75	5.45	2.44	8.41	1.61	2.96 (2.38-3.54)	1.43	<0.01
	B	96	4.73	2.47	6.92	2.67	2.19 (1.42-2.95)	0.85	<0.01
Making a Positive Impact with my Career	A	74	6.53	2.10	8.64	1.21	2.11 (1.67-2.55)	1.23	<0.01
	B	96	6.88	1.98	8.40	1.50	1.52 (1.00-2.04)	0.87	<0.01
Being Able to Become a Doctor	A	75	6.59	2.01	7.99	1.95	1.41 (0.92-1.90)	0.71	<0.01
	B	96	6.91	1.95	7.66	1.73	0.75 (0.24-1.26)	0.41	<0.01
Public Speaking	A	75	6.13	2.41	8.17	1.85	2.04 (1.50-2.58)	0.95	<0.01
	B	96	6.55	2.14	8.14	1.85	1.58 (1.05-2.11)	0.79	<0.01
Overall Confidence	A	75	6.41	2.09	8.16	1.77	1.75 (1.26-2.24)	0.90	<0.01
	B	96	6.71	1.91	8.21	1.73	1.50 (1.02-1.98)	0.82	<0.01

n = Number of questionnaires with both pre- and post-conference data completed.

A = Conference A Data

B = Conference B Data

SD = Standard Deviation; CI = Confidence Interval.

Effect size = Cohen's *d* effect size, which equates to increase in mean divided by pooled standard deviation: $0.2 \leq$ small effect size; $0.5 \leq$ medium effect size; $0.8 \leq$ large effect size.

p-value = result of the paired *t*-test: the probability of the change in mean confidence being due to chance.

Data is displayed to two decimal places.

Discussion

Both conferences aimed to improve confidence for WP pupils applying to medicine. Confidence is a crucial factor for medical school applicants and should be addressed by WP initiatives (7,8,9). Both conferences showed a statistically significant increase in levels of confidence in all the areas tested. Conference A showed a greater effect size and improvement in confidence than Conference B in five out of six areas. The authors speculate that this may be due to BR having more time to mentor participants prior to Conference A, than CA did for Conference B. This highlights the importance of support for pupils prior to the conference, as it improves confidence further.

Both conferences engaged young people in Lancashire, a cold spot area for medical outreach work (12). However, they utilised different methods for participant recruitment. Conference A did not use individual participant data to determine admission to the event. As a result, it is possible that many of the pupils at Conference A were not the appropriate target audience for WP initiatives. For Conference B, the encrypted application system used meant that potential participants could provide data on WP flags securely. As a result, all applicants with at least one WP flag were provided admission to attend.

The authors concluded that Conference B was more successful at targeting the appropriate audience for WP initiatives. It also had a higher attendance level, likely as more sixth forms knew about MOMs' work and reputation. A good reputation and adhering to strict WP criteria for attendance are therefore good pointers for student groups wishing to replicate this work.

Time is also essential for those wishing to run a similar intervention. CA organised Conference B alongside her regular studies, illustrating that it is feasible for conferences of this magnitude to be organised by full-time medical students.

Students considering a similar conference also need to consider funding. Funding for Conference B, for 104 participants, totalled £800. This was provided by university society funding which is feasible for other student groups to obtain. Interestingly, the largest expense for both conferences was catering. Future organisers could deliver the conference with no catering, thus delivering the event at an even lower cost.

Limitations

This study had several limitations. Confidence is more complex than a written scale, which may not accurately reflect improvements in confidence. Furthermore, participants may have felt inclined to

augment their scores on the post-conference questionnaire, possibly out of gratitude to the organisers. Future studies should consider focus groups to qualitatively explore the experience of the pupils.

The study did not assess for long-term impact measures, such as confidence levels later in the year or percentage of participants who successfully gained a place in medical school. This would have provided meaningful evidence of impact.

The organisers of both Conference A and B had delivered many large events for the same target audience previously. Through this, the organisers developed relevant skills, a team of dedicated medical student volunteers, a reputation with schools in their target area, and a supportive network at the University of Manchester. The success of the conferences was likely connected to these factors, which other medical student groups may not necessarily have. This could impact reproducibility by other groups.

The conferences took place prior to the COVID-19 pandemic, which has affected how events are delivered. MOMs have adapted their events to deliver them through online services. It is unknown how this will affect the impact of their work. They will gather data to compare the efficacy of the online events to their in-person events.

Conclusion

This study has shown that medical student-led conferences, at which Year 12 pupils deliver their own presentations, significantly improve pupil confidence. Supporting pupils prior to the conference with their presentations further improves confidence. This study emphasises the importance of WP flags for recruitment to ensure the conference is truly catering for WP pupils. Finally, it has shown that it is feasible for these conferences to be delivered by full-time medical students with minimal funding. Medical student WP groups should seek to replicate this work and the corresponding author can be contacted for more information if necessary.

Recommendations for future research are to evaluate the long-term impact of this intervention, such as assessing the effect on applications and admissions to medical school, and to evaluate the impact of this intervention using qualitative data such as focus groups.

Abbreviations

WP - Widening Participation

MSCSA - Medical Schools Council Selection Alliance

UK - United Kingdom

MOMs - Manchester Outreach Medics

BR - Ben Ryan

CA - Charlotte Auty

MPM - Manchester Prioritisation Model

POLAR3 - Participation of Local Areas Classification Groups

CI - Confidence Interval

SD - Standard Deviation

Declarations

Ethics approval

The methodology used was consistent with the Declaration of Helsinki and participants provided informed consent to take part in this study. The University of Manchester's Ethics Decision Tool and The National Health Service Health Research Authority's Ethics Decision tool were used to confirm that ethical approval was not needed for this study.

Consent for Publication

Not applicable.

Availability of Data and Materials

The data that supports the findings of this study is available from the corresponding author upon request.

Competing Interests

BR was assessed as part of his medical degree from The University of Manchester for his work on Conference A, for which EH was his supervisor.

Funding

The authors thank and acknowledge the University of Manchester's Faculty of Biology, Medicine and Health and Students' Union, Office for Fair Access, and National Collaborative Outreach Programme for providing funding to deliver these conferences. The authors thank and acknowledge Manchester Medical School's Division of Widening Participation for providing funding to publish this study.

Author's Contributions

BR designed the intervention and organised Conference A. BR contributed to the abstract, methodology, results, and discussion. BR revised the background and the conclusion.

CA organised Conference B. CA contributed to the methodology, results, discussion, and conclusion. CA performed the data analysis for the study.

MM searched for, and reviewed, relevant literature and contributed to the background. MM revised the methodology and discussion.

AL reviewed relevant literature and contributed to the background. AL revised the methodology, results, and discussion.

AS reviewed relevant literature and contributed to the background. AS revised the methodology and discussion.

EH supervised and contributed towards the design of the intervention. EH revised the abstract, background, methodology, results, discussion, and conclusion.

All authors read and approved the final manuscript.

Acknowledgements

The authors would like to thank and acknowledge Katie Barnes for supporting the organisation and supporting BR and CA in leading the team. The authors thank and acknowledge Helen Franklin for her support of the organisation. The authors thank and acknowledge those who ran individual sessions and panellists: James Adams, Lily Edwards, Holly Gibson, Alfred So, Ameera Selant, Dr Luke Cannon, Dr Clare Rayner, Dr Sunil Aggarwal, and Professor Madhavi Paladugu. The authors thank and acknowledge all volunteers in Manchester Outreach Medics for their hard work in delivering the conferences. The authors thank and acknowledge the General Medical Council and Medical Schools Council for their support with the conferences, particularly their representatives who delivered sessions: Ioanna Maraki and Clare Owen, respectively. The authors thank and acknowledge David McNally for his support and for delivering a lecture at Conference B.

Authors' Information

BR is a junior doctor in Lancashire and was a medical student at The University of Manchester. BR founded MOMs in September 2015 and was the project leader until August 2017.

CA is a junior doctor in Nottingham and was a medical student at The University of Manchester. CA started volunteering with MOMs in September 2016 and was the project leader from August 2017 to August 2019.

MM is a final-year medical student at The University of Manchester. MM started volunteering with MOMs in April 2017 and was the project leader from August 2019 to August 2020.

AL is a junior doctor in Lancashire and was a medical student at the University of Manchester. AL was a founding member of MOMs, contributed to the design and delivery of many of its sessions, and often co-ran events. She volunteered with MOMs until August 2017.

AS is a third-year medical student at The University of Manchester. AS started volunteering with MOMs in November 2017 and has been the project leader since August 2020.

EH is a General Practitioner in Manchester. EH is a Clinical Senior Lecturer and Widening Participation Lead at Manchester Medical School. EH has been extremely important in supporting MOMs.

References

1. Medical Schools Council Selection Alliance. Indicators of good practice in contextual admissions. Medical Schools Council. 2018.
2. Apampa A, Kubacki A, Ojha U, Xiang J. Challenges In Widening Participation Outreach: Is Enough Being Done To Tackle The Under-Representation Of Low-Income Students In Medicine? *Advances in Medical Education and Practice*. 2019 Nov; Volume 10.
3. Medical Schools Council Selection Alliance. Selection Alliance 2017 Report: An update on the Medical Schools Council's work in selection and widening participation. Medical Schools Council. 2017.
4. Office of National Statistics. NS-SeC. Nomis. 2011.
5. Hutt P, Gilmour S. Tackling inequalities in general practice. The King's Fund. 2010.
6. Dowell J, Norbury M, Steven K, Guthrie B. Widening access to medicine may improve general practitioner recruitment in deprived and rural communities: survey of GP origins and current place of work. *BMC Medical Education*. 2015 Dec 1;15(1).
7. Ball R, Alexander K, Cleland J. "The biggest barrier was my own self": the role of social comparison in non-traditional students' journey to medicine. *Perspectives on Medical Education*. 2020 Jun 22;9(3).
8. Mathers J, Parry J. Why are there so few working-class applicants to medical schools? Learning from the success stories. *Medical Education*. 2009 Mar;43(3).
9. McHarg J, Mattick K, Knight L v. Why people apply to medical school: implications for widening participation activities. *Medical Education*. 2007 Aug;41(8).
10. Nicholson S, Cleland JA. "It's making contacts": notions of social capital and implications for widening access to medical education. *Advances in Health Sciences Education*. 2017 May 14;22(2).
11. Kamali AW, Nicholson S, Wood DF. A model for widening access into medicine and dentistry: the SAMDA-BL project. *Medical Education*. 2005 Sep;39(9).
12. Medical Schools Council. Implementing Selecting for Excellence: A progress update. Medical Schools Council. 2016.
13. Cleland JA, Nicholson S, Kelly N, Moffat M. Taking context seriously: explaining widening access policy enactments in UK medical schools. *Medical Education*. 2015 Jan;49(1).
14. Azmy J, Nimmons D. Reflections on a widening participation teaching role. *The Clinical Teacher*. 2017 Apr;14(2).
15. Ojha U, Patel S. Student-led widening access schemes. *Advances in Medical Education and Practice*. 2017 Aug;Volume 8.
16. Ryan B, Kitchen A, Chan A, Gibson H, Haque E. Widening participation to medicine: a student-led workshop for medical school applicants. *MedEdPublish*. 2018;7(2).

17. Ministry of Housing Communities and Local Government. The English Indices of Deprivation 2019 (IoD2019). 2019.
18. The University of Manchester. Widening Participation Strategic Assessment. 2009.
19. Cohen J. Statistical Power Analysis for the Behavioural Sciences. 2nd ed. New York: Lawrence Erlbaum Associates; 1988.

Supplementary Files

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