C4ME Special Supplement

VOLUME 4, No.3
30 November 2020
ISSN 2514-3174
bsdj.org.uk

BSDJ

Women in Medical Education:

Have we broken the glass ceiling?

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

bsdj.org.uk

/thebsdj

@thebsdj

@thebsdj

Journal DOI
10.18573/issn.2514-3174

Issue DOI
10.18573/bsdj.v4i3

The **British Student Doctor** is published by **The Foundation for Medical Publishing**, a charitable incorporated organisation registered in England and Wales (Charity No. 1189006), and a subsidiary of the **The Academy of Medical Educators.**

Cardiff University Press
Gwasg Prifysgol Caerdydd

The British Student Doctor is an imprint of Cardiff University Press, an innovative open-access publisher of academic research, where 'open-access' means free for both readers and writers.

cardiffuniversitypress.org

The British Student Doctor, 2020;4(3):1-2
doi: 10.18573/bsdj.253
Editorial

Welcome to the 2020 C4ME Special Supplement

Editorial

Julie Browne
Honorary Editor of The British Student Doctor
Cardiff University School of Medicine

Address for Correspondence:

Julie Browne
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU

Email: BrowneJ1@cardiff.ac.uk

ORCID ID: https://orcid.org/0000-0003-2712-3812

No conflicts of interest to declare

Accepted for publication: 18.11.20

Welcome to the second annual C4ME Special Supplement of *The BSDJ*!

This is another exciting, eclectic and scholarly mix of papers showcasing the high quality and wide range of research work that Cardiff's intercalating medical students generated during 2019-20 as they undertook an additional year of study and hands-on research experience sandwiched between years 3 and 4, or 4 and 5, of the Cardiff MBBCh course.

The articles in this supplement provide evidence that Cardiff's intercalated courses offer students research experience in an astonishing range of academic topics. Far from reflecting work conducted in a remote ivory tower, these articles bear witness to the students' deep encounters with evidence-based medicine – *"where the rubber meets the road"* (Greenhalgh 2003). That is to say, the place where academic study and research evidence directly intersect with practical questions such as how patients experience healthcare, how new treatments can be devised using rigorous research and evaluation, how healthcare advice is understood and implemented in practice, and how guidance may be improved in specific areas of healthcare. Many of the papers in this issue have a passionate concern for social justice at their heart: a number address the important issue of how medical students can be better prepared to become the innovative, skilled and principled doctors of the future.

The context in which this excellent work was undertaken needs to be remembered. In early March 2020, just as the authors of these papers were preparing for their final assessments, the Prime Minister of the UK, Boris Johnson, stated that COVID-19 *"is the worst public health crisis for a generation"* and everything changed. Many of our students stepped forward immediately, volunteering their services wherever they were needed; all displayed amazing professionalism and pushed forward undeterred to complete their studies with yet another set of outstanding results. We could not be prouder of them.

In this world of uncertainty, one thing is clear; more than ever the world needs innovative, accomplished and principled doctors and medical academics, equipped with the practical and intellectual skills to lead the research endeavours of the future and to interpret and implement scientific evidence to the benefit of patients and populations everywhere. We are proud of the part our intercalated programme plays in this endeavour and wish to pay particular tribute to the Programme Lead, Dr Hollie Thomas, under whose leadership the programme has gone from strength to strength.

As always, we thank the editorial team of *The BSDJ* for their tremendous energy and support in producing this special supplement. Thanks also go to the staff and faculty who worked behind the scenes to support the research projects, advise the authors and review the manuscripts. We're confident that readers will enjoy this fascinating glimpse into the work of the iBSc 'class of 2020' and we wish its authors every success as they continue their medical studies.

References

Greenhalgh T. Doing an intercalated BSc can make you a better doctor. Medical Education. 2003;37:760-761.

https://doi.org/10.1046/j.1365-2923.2003.01603.x

The British Student Doctor, 2020;4(3):3-6
doi: 10.18573/bsdj.207
C4ME Supplement

Women in medical education: a qualitative study of female educators' narratives on career crossroads

C4ME SUPPLEMENT

AUTHOR INFORMATION

Osa Eghosa-Aimufua
Cardiff University School of Medicine

Julie Browne
Cardiff University School of Medicine

Dr Katie Webb
Cardiff University School of Medicine

Address for Correspondence:

Osa Eghosa-Aimufua
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU

Email: EghosaAimufuaO@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 10.11.20

Background

Recent years have seen a significant gender shift within medicine as a whole, with the proportion of female graduates outweighing male graduates in the UK. (1) Despite this, within medical education and academia, women remain underrepresented in senior roles. (1) Studies have found that women are more likely to take career breaks and switch career due to family or caring commitments, even considering leaving the medical profession altogether. (2, 3) Few studies have explored in depth the reasons behind the career choices of female medical educators and there is a particular shortage of research into women's experience of career crossroads and the impact of these on professional development. This study aimed to collate the written accounts of female clinical educators regarding such experiences and the influence of these on their attitudes, behaviours and professional development.

Methods

Participants were recruited to this study through professional medical education networks of the Academy of Medical Educators via email and Twitter. Female clinical educators, belonging to at least one professional medical education body, were purposefully sampled. Two rounds of recruitment took place, the first in June 2018 and the second in December 2019 during the process of data analysis.

Data were collected through a secure online questionnaire. Open questions were used to gather qualitative data on participants' experiences of noticeable changes or crossroads within their working lives. Fifty-five participants were recruited from various countries including UK, Australia, Canada, US and Europe.

Data were analysed using narrative enquiry, according to Labov's six-part framework, which outlines the elements commonly seen in all types of narratives. These are; abstract, orientation, complicating action, resolution and coda (**Table 1**). (3) An inductive approach was then used to identify emergent themes within the different structural elements of the narratives in collaboration with supervisors. There was cross-correlation of themes to increase analytical rigour. NVivo 12 was used for the management and analysis of data.

Cardiff University School of Medicine Research Ethics Committee granted ethical approval.

Results

The typical narratives of participants conformed to a clear structure suggesting that writers understood conventions of autobiographical storytelling. Labov's categories, were not present in equal quantities; 'complicating action', 'evaluation' and 'coda' categories were consistently present, although, an 'abstract' was notably absent from all accounts. Interestingly, participants employed a style akin to that of reflective writing in their 'evaluation', giving the narratives a sense that they were more practised. This may be attributed to clinicians being experienced in reflective writing and therefore may naturally employ such techniques in their accounts.

Themes identified within the key narrative categories were as followed (**Figure 1**):

> **Complicating action:** *destabilising event/conflict, personal desire/interest, work-life balance, positive drivers, opportunity;*
> **Evaluation:** *awakening, overcoming barriers/resilience;*
> **Coda:** *gratitude, work satisfaction, applications to current practice & learning.*

Results identify factors which seemingly 'pushed' participants towards a career in medical education, such as issues in previous roles or changes to personal circumstances, and those that 'pulled' them towards a career in medical education, such as the influence of positive role models or mentors and an enjoyment of teaching. Regardless of experience, many participants reflected positively on how they had risen to challenges and learned new things about themselves along the way. Participants perceived these to have ultimately benefited them and contributed positively to their personal and professional development.

Discussion

In applying Labov's framework (3) to the narratives of female educators, this study has provided insight into how female clinical educators have made sense of key turning points in their careers temporally and the subsequent impact of these towards their attitudes and professional development; A topic area which has not been specifically explored before.

Studies looking into the motivations of clinicians in pursuing careers in medical education frequently note 'pull' factors, such as passion for teaching and influential role models and mentors. (4-6) Whilst this study supports these being a factor, it suggests that for many female clinical educators their journey into education was the result of a change in personal circumstance or wanting an escape from previously stressful work situations, such as those of clinical practice. Previous research indicates that female physicians have significantly higher rates of burnout than males (7) which may make them more inclined to seek alternate roles outside of clinical practice. The idea of achieving greater work-life balance was also a motivating factor into the profession, which is in contrast to much of the literature around females in academic medicine, which frequently report achieving work-life balance to be a challenge. (8, 9)

Significant consideration given to work-life balance by female educators highlights the necessity of support within the profession for out-of-work or personal commitments. Furthermore, findings highlight the necessity of role models and mentors in inspiring women to enter medical education; benefits can therefore be found in increasing mentorship and networking opportunities with medical educators for females navigating careers in medicine.

This study has additional implications for how future research may be conducted, considering how people represent their stories through written narratives. The use of Labov's framework (3) offers a unique approach to examining the effects of specific events on personal experience. Physicians and academics are highly literate people, therefore an approach which comprises literary forms of data collection and analysis may be appropriate for studies within the medical field, perhaps revealing dimensions of meaning and interpretation which other methods may not.

Lessons Learnt

My main challenges during this project revolved around the analysis and presentation of my data. I initially sought to soley analyse my data using Labov's structural narrative analysis (3) however found that incorporating an additional thematic approach allowed for the content of the narratives to be analysed in greater depth.

I was particularly worried about my own researcher perspectives influencing the results of my analysis. As I gained greater understanding of the social constructivist philosophy underpinning my research, I realised that my opinions would inevitably combine with the evidence from the data to produce new understandings and interpretations. (10) Overall my understanding of qualitative research methods has greatly improved, and I will continue to be reflexive in my approach to future research.

References

1. Medical Schools Council. Survey of Medical Clinical Academic Staffing Levels 2018. London: Medical Schools Council; 2018 [accessed 13 Dec 19]. Available from: https://www.medschools.ac.uk/media/2491/msc-clinical-academic-survey-report-2018.pdf.

2. British Medical Association. Junior doctors career trends survey. London: BMA; 2018 [accessed 13 Dec 2019]. Available from: https://www.bma.org.uk/collective-voice/policy-and-research/education-training-and-workforce/juniors-career-survey.

3. Labov W. Language in the inner city : studies in the black English vernacular. Oxford: Blackwell; 1977.

4. Owen C, McGill D, Dorai-Raj A, Dahlstrom J, Tymms K, Watson DAR. What motivates senior clinicians to teach medical students? BMC Medical Education. 2005;5(1):27.

https://doi.org/10.1186/1472-6920-5-27

5. Kumar K, Roberts C, Thistlethwaite J. Entering and navigating academic medicine: Academic clinician-educators' experiences. Medical Education. 2011;45(5):497-503.

https://doi.org/10.1111/j.1365-2923.2010.03887.x .

6. Bartle E, Thistlethwaite J. Becoming a medical educator: motivation, socialisation and navigation. BMC Medical Education. 2014;14(1).

https://doi.org/10.1186/1472-6920-14-110

7. Peckham C. National Physician Burnout & Depression Report. New York, NY: Medscape; 2018 [accessed 10 May 2020]. Available from: https://www.medscape.com/slideshow/2018-lifestyle-burnout-depression-6009235#15.

8. Pololi LH, Jones SJ. Women faculty: An analysis of their experiences in academic medicine and their coping strategies. Gender Medicine. 2010;7(5):438-50.
https://doi.org/10.1016/j.genm.2010.09.006

9. Edmunds LD, Ovseiko PV, Shepperd S, Greenhalgh T, Frith P, Roberts NW, et al. Why do women choose or reject careers in academic medicine? A narrative review of empirical evidence. The Lancet. 2016;388(10062):2948-58.

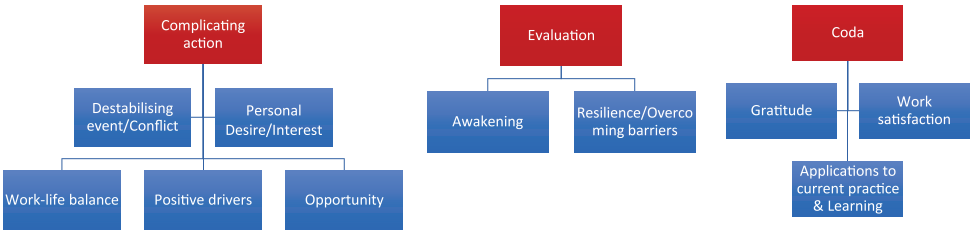
https://doi.org/10.1016/S0140-6736(15)01091-0

10. Riessman CK. Narrative methods for the human sciences. Los Angeles: Sage Publications; 2008.

Table 1: Description of Labov's narrative components (3)

Component of Narrative	Description
1. Abstract	An initial clause in a narrative that provides an introduction to the events of the narrative and summary of what is to come.
2. Orientation	Clauses which provide information on the setting and context of the events of the narrative, such as time, place and characters involved.
3. Complicating action	The complicating action is the obligatory part of a narrative and describes the main events of the story through a sequence of temporally oriented clauses.
4. Evaluation	Evaluative clauses convey the point of a narrative and the personal relation and interest to the narrator.
5. Resolution	The resolution concludes the events of the complicating action
6. Coda	The final clauses which signify the end of the narrative and return it to the present moment of telling.

Figure 1: Summary of themes identified within narrative categories



The British Student Doctor, 2020;4(3):7-9
doi: 10.18573/bsdj.199
C4ME Supplement

Women in medical education: an exploration of female educators' narratives

C4ME SUPPLEMENT

AUTHOR INFORMATION

Alicia Boam
Cardiff University School of Medicine

Dr Katie Webb
Cardiff University School of Medicine

Julie Browne
Cardiff University School of Medicine

Address for Correspondence:

Alicia Boam
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: BoamAP@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 14.11.20

Link to YouTube Video:
https://www.youtube.com/watch?v=45Bk0fDilaA

Background

During the last decade, growing evidence has shown that women are underrepresented in medical education, particularly in senior roles. (1) Medical education is a subset of academic medicine and encompasses the fields of research, management, curriculum design and assessment. (2) A 2018 report by the Medical Schools Council found that the proportion of women in academic medicine decreases with increased seniority, with only 19% of the UK's medical professors being female. (1, 3)

Some implementations, such as programmes in mentoring, have attempted to combat gender imbalance in academic medicine; (4) however, these are poorly evaluated and primarily conducted in the US. A shortage of women in medical education may lead to a loss of intellectual capital and potentially cause issues with staffing as the proportion of women entering clinical medicine continues to rise. (4-7)

A literature review using the Medline Via Ovid database revealed little information on the reasons behind the underrepresentation of women in medical education. The primary aim of this study is to explore the narratives of women medical educators in the UK at a point of career crossroads to investigate the factors which may advance or retard career progression.

Methods

Due to the exploratory nature of the study, the researchers adopted an inductive approach using qualitative methods. Interview participants were recruited via a two-step self-selection process. Firstly, a short survey was distributed via the AOME twitter account inviting female medical educators to complete a case report on their experience of a career crossroads. These written data were analysed in a separate report. The survey provided an option for women to leave details to be contacted for an interview. The target participants were female medical educators from the UK who were members of an official academy or network of medical education.

Three researchers (KW, JB and LA) conducted semi-structured telephone interviews to investigate the experiences of female medical educators. A topic guide ensured a consistent interview approach.

Grounded theory analysis was employed to generate theoretical concepts. This was deemed appropriate for the research topic as the literature review revealed little pre-existing research on women in medical education. To ensure rigorous analysis the interviews were double-coded. Two reviewers coded the transcripts independently and undertook discussions of the coding with a third reviewer present. An analytical framework was developed collaboratively by all three researchers and transferred to NVivo, allowing structured visual organization. The framework was continually adapted, and new codes added as they emerged. New themes were still being identified throughout analysis, suggesting that data saturation was not reached. However, the data collected were rich and informative, giving good insight into women's experiences.

To minimise researcher bias, the author employed reflexivity throughout the process and considered her own position as a woman in medical education who may have her own preconceptions.

The Cardiff University School of Medicine Research Ethics Committee granted ethical approval in 2018, prior to data collection. An ethical amendment was passed in September 2019 for the author to access the data, conduct data analysis and collect further data if required.

Results

A sample size of n=9 was achieved, generating 6 hours, 37 minutes of data.

The effect of gender

Only one participant noted explicit gender bias within a male-dominated workplace. The others did not mention it.

There was evidence of internalised gender bias by some of the women, particularly through their use of gendered language. Participant D stated feeling she needed to *"man-up and get some resilience",* whilst participant I claimed that she was not the *"wishy-washy female type"*.

This suggested that the women were influenced by stereotype threat, whereby women may be less likely to pursue leadership as they fear others regard them as less suited to these typically masculine positions. (7)

Some of the women denied any influence of gender upon their career path, but subsequently described how gender-related experiences, such as being a single mother, had affected their job progression. Many of the women perceived an incompatibility between active parenting and senior professional roles, providing another possible explanation for the lack of women in leadership in medical education:

> *"Does [my gender] affect me sitting on national boards? Yes, because I'm a mummy…maybe a little more than that I'm a single mummy."* – Participant D

Motivators

A variety of intrinsic and extrinsic motivators were identified in driving the progression of the women's career paths. These included the intrinsic motivators of personal interest and an established medical educator identity and extrinsic motivators of gaining qualifications and funding for research, having effective role models and creating meaningful professional networks.

Discussion

The challenges of establishing a medical educator identity, overcoming gender bias, gaining social capital, creating meaningful networks and achieving required qualifications often outweigh the perceived reward of leadership roles. The complexity of navigating

these factors often inhibits women from fully participating in and taking up opportunities since they may perceive more senior roles as being incompatible with other aspects of their lives. To combat the continued presence of implicit gender bias in the workplace, a change in workplace culture and the implementation of additional work-facilitating policies are vital. (8)

Establishing meaningful workplace networks was found to be important for female medical educators. However, literature suggests that women are more likely to experience guilt and shame from utilising professional networks than men. (9) Guidance for female networking could prove useful in reducing feelings of shame and generating effective networks in the workplace.

Overall, by exploring the narratives of nine women, this study has revealed the complex interaction of multiple factors, which influence the pathway of female medical educators. There are many changes in workplace culture and structure as well as in the support networks provided for women that could contribute to increasing female representation. More research is required in these areas to generate achievable and specific solutions.

Lessons Learnt

Working with data collected prior to my involvement was a challenge. I initially felt I may be unable to adequately analyse the data, as I had not conducted the interviews myself and was c oncerned that I may not understand the project as deeply as if I had designed the data collection. However, I came to realise that not being involved in data collection might have its advantages, particularly in grounded theory analysis where minimising researcher bias is of utmost importance. (10) I felt I could enter data analysis with a high level of impartiality, as I had no preconceptions of the interview participants. To ensure I fully understood the methods used, I conducted an interview that was not included in the final report, but this helped deepen my knowledge of the methods. Overall, I learnt that entering a project after data collection is not a disadvantage and may even be an advantage in some cases. In future projects, I will feel more comfortable and confident if I am part of a larger project, even if I have not been involved in every aspect of the research design.

References

1. McKimm J, Da Silva A, Edwards S, Greenhill J, Brown C. Women and leadership in medicine and medical education. International Perspectives. 2015;2:69-98.

2. Bligh J, Brice J. Further insights into the roles of the medical educator: the importance of scholarly management. Acad Med. 2009;84(8):1161-5.

3. Watson N. Survey of medical clinical adademic staffing levels. London: Medical Schools Council; 2018.

4. Laver KE, Prichard IJ, Cations M, Osenk I, Govin K, Coveney JD. A systematic review of interventions to support the careers of women in academic medicine and other disciplines. BMJ Open; 2018 8(3) [accessed 14 Dec 2020]. Available from: https://bmjopen.bmj.com/content/8/3/e020380.

5. Coe IR, Wiley R, Bekker L-G. Organisational best practices towards gender equality in science and medicine. The Lancet. 2019;393(10171):587-93.

6. Edmunds LD, Ovseiko PV, Shepperd S, Greenhalgh T, Frith P, Roberts NW, et al. Why do women choose or reject careers in academic medicine? A narrative review of empirical evidence. The Lancet. 2016;388(10062):2948-58.

7. Bergeron DM, Block CJ, Echtenkamp A. Disabling the able: stereotype threat and women's work performance. Human Performance. 2006;19(2):133-58.

8. Krivkovich A, Nadeau MC, Robison K, Robinson N, Starikova I, Yee L. Women in the workplace. New York, NY: McKinsey & Company; 2019.

9. Gersick CJG, Dutton JE, Bartunek JM. Learning from academia: the importance of relationships in professional life. Academy of Management Journal. 2000;43(6):1026-44.

10. Punch K. Introduction to Social Research: quantitative & qualitative approaches. London: Sage Publications Ltd; 2014.

The British Student Doctor, 2020;4(3):10-12
doi: 10.18573/bsdj.190
C4ME Supplement

Qualitative analysis of the development of self-regulated learning skills in year 1 medical students

C4ME SUPPLEMENT

AUTHOR INFORMATION

Tu Xuong Michelle Ly
Cardiff University School of Medicine

Professor Stephen Rutherford
Cardiff University School of Medicine

Julie Browne
Cardiff University School of Medicine

Address for Correspondence:

Tu Xuong Michelle Ly
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: lytx@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://www.youtube.com/watch?v=nwtqxqVHaSY

Background

Educational activities in higher education revolve around effective self-regulated learning (SRL). SRL is a common theme in educational research because of its link to self-efficacy and independent learning in students. (1, 2) These students are also better at acclimatising to university life as they transition from school to higher education and thus, have a decreased chance of dropping out of university. (3, 4)

Studies of transition and self-regulation predominantly investigate students on non-vocational courses. However, students who are studying vocational courses (e. g. medicine) may also demonstrate the need for self-regulation. Medical students are typically high achievers and so it is probable that they already possess high levels of self-regulation. The importance of SRL lies in the fact that doctors are required to possess lifelong learning behaviours, such as in the long-term acquisition of knowledge and skills. (5, 6)

Cardiff University (CU) medical students are an interesting cohort because they initially spend semester one in a didactic curriculum, Platform for Clinical Sciences (PCS), and then progress to an inquiry-based curriculum of Case-Based Learning (CBL) in the second semester. These students experience two educational paradigms in Year 1 alone.

SRL in medical students and factors affecting their transition to medical schools are usually researched as unrelated topics. Therefore, this study aimed to explore SRL in medical students as they transition into the first year of university.

Methods

A qualitative research paradigm was employed to investigate students' perceptions of the development of their SRL skills. Year 1 medical students were recruited in a core lecture at the start of the academic year. Two cycles of semi-structured interviews were held in the first and second semesters.

The approach to data analysis was informed by Charmaz's constructivist grounded theory (CGTh). (7) The interviews were initially analysed using line-by-line coding techniques and then more detailed codes were produced using the NVivo 12 software. This process was carried out iteratively and constant comparative methods were used to identify similar themes between transcripts. Coding for interview cycle 1 was initiated and continued during data collection for cycle 2.

The project supervisor had already sought ethical approval through the School of Medicine Research Ethics Committee prior to the commencement of this study. Ethical considerations surrounding confidentiality and participant safety were also addressed.

Results

Seven participants volunteered to partake in this study and were in the age range of 18 to 20 years. Coding produced 217 and 272 codes for interview cycles 1 and 2 respectively and five common themes were identified. The main overarching theme was the change in the environment during transition (Figure 1).

Students displayed some levels of self-regulation prior to university, which helped them to adapt to the change in environment from school to PCS and then from PCS to CBL. This included adapting to the educational, emotional and social environments of university. In terms of the educational environment, participants reported that the self-directed learning (SDL) in PCS and CBL was difficult as they were unaccustomed to SDL at school. However, the overall perceived benefits of SDL increased in the second semester as students understood that it would be beneficial for the long-term learning required when they are doctors.

Throughout PCS and CBL, participants felt uncertain in the parameters of their learning due to the large amounts of SDL. However, participants enjoyed having CBL facilitators who directed students' learning in the right direction. Participants were also uncertain about the method of learning that they should adopt at university. Prior to attending university, six of the participants predominantly handwrote their notes. There was an overall trend of transitioning to digital forms of notetaking as participants progressed through Year 1. As a result of the widespread uncertainty, participants compared themselves and the work they had carried out to their peers, which created a competitive atmosphere in both semesters.

Discussion

Year 1 CU medical students adapted to two transition points, including the transition from school to PCS and then from PCS to CBL. They were required to use self-regulation to adapt to the change in the educational, social and emotional environments. Participants' self-regulation was augmented in the second semester as they took responsibility for their own learning.

Uncertainty demonstrated by the students has been also shown in doctors in previous studies. For example, doctors may be uncertain in making a diagnosis or selecting the appropriate tests for patients. (8) The uncertainty in students' parameters of learning led to comparison, including comparing their notes to others. Whilst research has shown that physically handwriting notes provided an extra layer of memory, (9) participants preferred typewriting as it was more convenient for group learning in CBL. Overall, uncertainty contributed to a competitive atmosphere, which has been shown to allow certain students to succeed quicker than others. (10)

Students already possessed some self-regulation prior to starting university. Thus, universities should support first year medical students in refining these skills, which would help them to effectively transition between the different environments.

Lessons Learnt

My previous research experience has predominantly been in the clinical or laboratory setting. Therefore, I initially found the qualitative approach to research quite challenging, particularly understanding how to conduct effective interviews using the principles of CGTh. My interviewing techniques improved significantly in the second cycle as I asked more probing questions which allowed participants to provide more detailed answers. I also understood the benefits of undertaking qualitative research aligned to the CGTh as I was able to obtain results that were grounded in the data.

The qualitative approach to this study proved challenging but undertaking an intercalated degree in medical education and subsequently carrying out this research project has allowed me to develop skills that will be invaluable towards my development as a future clinician and as an educator. I look forward to undertaking further work with this project including carrying out comparison studies in other medical schools that only have one teaching style throughout their first year. Overall, results produced from this study will be important in shaping the undergraduate medical curricula for future medical students.

References

1. Kolić-Vehovec S, Rončević B, Bajšanski I. Motivational components of self-regulated learning and reading strategy use in university students: The role of goal orientation patterns. Learn Individ Differ. 2008;18:108-13.

2. Paris SG, Paris AH. Classroom Applications of Research on Self-Regulated Learning. Educ Psychol. 2001;36:89-101.

3. Zimmerman BJ. Becoming a self-regulated learner: Which are the key subprocesses? Contemp Educ Psychol. 1986;11:307-13.

4. Lowe H, Cook A. Mind the Gap: Are students prepared for higher education? J Furth High Educ. 2003;27:53-76.

5. GMC. Outcomes for graduates 2018. London: General Medical Council; 2018 [accessed 12 Mar 2020]. Available from: https://www.gmc-uk.org/-/media/documents/dc11326-outcomes-for-graduates-2018_pdf-75040796.pdf

6. Hauer KE, Iverson N, Quach A, Yuan P, Kaner S, Boscardin C. Fostering medical students' lifelong learning skills with a dashboard, coaching and learning planning. Perspect Med Educ. 2018;7:311-7.

7. Charmaz K. Constructing Grounded Theory. London. SAGE; 2014.

8. Ghosh AK. Understanding Medical Uncertainty: A Primer for Physicians. J Assoc Physicians India. 2004;52:739-42.

9. Smoker TJ, Murphy CE, Rockwell AK. Comparing Memory for Handwriting versus Typing. Proc Hum Factors Ergon Soc Annu Meet. 2009;53:1744-7.

10. Lempp H, Seale C. The hidden curriculum in undergraduate medical education: qualitative study of medical students' perceptions of teaching. BMJ. 2004;329:770-3.

Figures

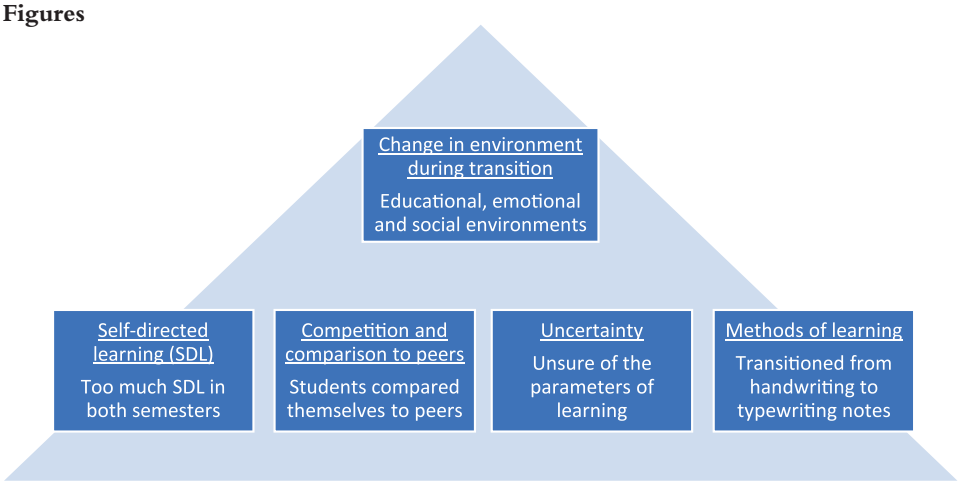


Figure 1 *– Hierarchical structure of the common themes in both interview cycles.*

The British Student Doctor, 2020;4(3):13-16
doi: 10.18573/bsdj.196
C4ME Supplement

Quantitative analysis of the development of self-regulated learning in year 1 medical students

C4ME SUPPLEMENT

AUTHOR INFORMATION

Jessica Randall
Cardiff University School of Medicine

Professor Stephen Rutherford
Cardiff University School of Medicine

Julie Browne
Cardiff University School of Medicine

Address for Correspondence:

Jessica Randall
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: RandallJL@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://youtu.be/AmL5oCxLZAY

Background

Doctors must constantly update their knowledge in order to provide the best quality patient care. (1) To do so, they should become 'lifelong learners' (1) through the development of self-regulated learning (SRL). (2) SRL can be defined as the ability of students to be active participants in their learning, behaviourally, motivationally and metacognitively. (3) SRL is vital for succeeding Year 1 of medical school, yet the transition to university can be challenging for students. (2)

Medicine is a demanding course with a heavy workload. (2) Successful learning in Year 1 is dependent upon study time, yet many medical students struggle with time management (4) and 14.9% experience burnout. (2) Curriculum design also has an effect with students on problem-based learning courses developing better SRL skills than those on 'traditional' courses. (5) However, no studies focus on how a Case-Based Learning (CBL) curriculum affects SRL development. Therefore, the research question of this project was "how does a CBL medical course affect the development of SRL in Year 1 medical students?". The research aims were to identify and assess what factors affect SRL development in Year 1 medical students on a CBL course and study the extent to which these factors impact upon the cohort as a whole. The project was conducted at Cardiff University as the C21 Medical course has a CBL structure.

Methods

A quantitative methodology was chosen so that a replicable, structured research instrument could be developed that can be used at scale on whole cohorts and would allow for a valid, objective measure of SRL skill. A systematic design process was employed to create a survey, including a literature review, theme identification, question design, expert review and piloting. Although the literature review revealed existing questionnaires on SRL, they were not fully applicable to this project's research aims and failed to assess SRL in context. As such, new scales were developed for this project and were based on a prior qualitative study conducted at Cardiff University.

Data was captured on the 2019/20 cohort of Year 1 medical students at Cardiff University during February and March 2020. The survey was delivered online and advertised through an announcement on the virtual learning environment Learning Central, social media and a lecture 'shout-out'. Ethical approval was obtained from Cardiff University's School of Medicine Research Ethics Committee.

Data was analysed using SPSS Statistics 25. Responses to Likert and frequency scales were converted to numbers depending on whether the items were phrased positively or negatively. 5 indicated a positive response to an item and 1 indicated a negative response. To compare individual items, the median for each item was graphed on bar charts. Composite scales were created from related survey items by calculating the mean composite score for each participant and assessed for normality with the Shapiro-Wilk test (W). The Cronbach alpha coefficient was calculated for each scale to assess inter-rater reliability. The Kruskal-Wallis test (X^2) was used to assess for differences between 3 subgroups when the scale was not normally distributed.

Results

32.2% (91/283 students) of Year 1 medical students at Cardiff University completed the survey. 74 respondents were female, 17 were male and the median age was 19 years. There was no significant difference between males and females for any of the outcomes measured, therefore, they can largely be considered a homogenous group.

Students' ease of transition to university was normally distributed ($W[91] = 0.974$, $p = 0.061$). 15.4% of students transitioned well to university (those with a score 1 standard deviation above the mean), 73.6% were neutral and 11% did not transition well (those with a score 1 standard deviation below the mean).

Student competitiveness was not normally distributed ($W[90] = 0.945$, $p = 0.001$). Instead, students were competitive with each other, as responses were slightly skewed towards the positive with the peak at 3.25-3.75. However, there was still a substantial tail suggesting a small number of students are not competitive. Students were more influenced by not wanting to appear stupid in front of their peers than academic ranking, with 67.0% and 36.3% respectively rating that that it applied to them frequently or all of the time. Workload was not normally distributed ($W[91] = 0.966$, $p = 0.01$). It had a bimodal distribution with peaks at 2.50-2.83 and 3.16-3.49. Although approximately half of students were coping well with their university workload, half were not. No students were coping extremely well whereas quite are few were coping extremely poorly. Students struggling with their workload were most likely to sacrifice socialising, sleep and exercise in order to cope, and least likely to sacrifice attendance at taught sessions. 54.9% would ask a Year 1 medical student for help; 35.2% would try to work it out for themselves.

No significant difference was found between those that transitioned well, transitioned poorly or had a neutral transition to university in terms of competitiveness ($X^2[2] = 0.940$, $p = 0.625$) or ability to cope with workload ($X^2[2] = 5.215$, $p = 0.074$).

Discussion

This study found that SRL development in Year 1 medical students on a CBL course is independent of how easily students transitioned to university as there was no significant difference when variables are analysed by ease of transition.

Instead, workload was key with over half of respondents unable to cope with it. This is concerning as workload is a major source of stress for medical students and can result in an inability to learn effectively, with a focus on surface rather than deep learning. (4) Students with underdeveloped SRL demonstrate more procrastination behaviours and, as they are reluctant to ask for help like 35.2% of respondents in our study, are at increased risk of poor academic performance. (6)

Respondents' coping strategies appeared to be poorly developed with them sacrificing key wellbeing aspects to cope with workload. Although there has been much focus in the literature on factors affecting wellbeing, including mental health and psychological distress, (7) financial pressure and work-life balance, (8) little has been done to study the impact of curriculum design. As SRL can be taught and improved through educational practice, (9) future research should explore whether altering the curriculum can improve SRL, workload coping strategies and subsequent wellbeing.

Lessons Learnt

The biggest lesson I learnt was that the amount of time, effort and dedication required to produce high-quality research should not be underestimated.

For example, even though there is a relatively limited literature base on SRL, it was time-consuming to review. At times, I felt overwhelmed by the volume of words to read. As I had not regularly read full articles before, preferring to skim the abstract, I was lacking in skill or experience in condensing large amounts of information. However, after experimentation, I discovered that I disliked having multiple web browser tabs open, so stored all details relating to the articles in a table.

I will continue to use this technique in the future as having specific column titles helped me to prioritise the key information I needed to draw out to inform my project and acted as a thorough reference document to refer back to, making the 'writing-up' process easier.

References

1. Cho KK, Marjadi B, Langendyk V, Hu W. Medical student changes in self-regulated learning during the transition to the clinical environment. BMC Medical Education. 2017;17(1):59. doi: 10.1186/s12909-017-0902-7

2. Barbosa J, Silva A, Ferreira MA, Severo M. Transition from secondary school to medical school: the role of self-study and self-regulated learning skills in freshman burnout. Acta Medica Portuguesa. 2016;29(12):803-8. doi: 10.20344/amp.8350

3. Zimmerman BJ. Investigating self-regulation and motivation: historical background, methodological developments, and future prospects. American Educational Research Journal. 2008;45(1):166-83. doi: 10.3102/0002831207312909

4. Barbosa J, Silva A, Ferreira MA, Severo M. Do reciprocal relationships between academic workload and self-regulated learning predict medical freshmen's achievement A longitudinal study on the educational transition from secondary school to medical school. Advances in Health Sciences Education. 2018;23:733-48. doi: 10.1007/s10459-018-9825-2

5. White CB. Smoothing out transitions: how pedagogy influences medical students' achievement of self-regulated learning goals. Advances in Health Sciences Education. 2007;12:279-97. doi: 10.1007/s10459-006-9000-z

6. Artino AR, Dong T, DeZee KJ, Gilliland WR, Waechter DM, Cruess D, et al. Achievement goal structures and self-regulated learning: relationships and changes in medical school. Academic Medicine. 2012;87(10):1375-81. doi: 10.1097/ACM.0b013e3182676b55

7. Lewis EG, Cardwell JM. A comparative study of mental health and wellbeing among UK students on professional degree programmes. Journal of Further and Higher Education. 2019;43(9):1226-38. doi: 10.1080/0309877X.2018.1471125

8. Hill MR, Goicochea S, Merlo LJ. In their own words: stressors facing medical students in the millennial generation. Medical Education Online. 2018;23(1) [accessed 19 Nov 2020]. Available from: https://tandfonline.com/doi/full/10.1080/10872981.2018.1530558

9. Durning SJ, Cleary TJ, Sandars J, Hemmer P, Kokotailo P, Artino AR. Viewing "strugglers" through a different lens: How a self-regulated learning perspective can help medical educators with assessment and remediation. Academic Medicine. 2011;88(4):488-95. doi: 10.1097/ACM.0b013e31820dc384

The British Student Doctor, 2020;4(3):16-19
doi: 10.18573/bsdj.211
C4ME Supplement

'Can you watch me please?' An evaluation of supervised learning events for medical students

C4ME SUPPLEMENT

AUTHOR INFORMATION

Ami Desai
Cardiff University School of Medicine

Dr John Green
C4ME - Cardiff University of Medicine

Dr Emily Harrop
Cardiff University School of Medicine

Dr Rhian Goodfellow
C4ME - Cardiff University of Medicine

Address for Correspondence:

Ami Desai
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: DesaiAP@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://youtu.be/nwMaX06tLAI

Background

The Mini-Clinical Evaluation Exercise (Mini-CEX) is a formative tool utilised within the UK Foundation Programme to assess competence of junior doctors through observation of clinical tasks. (1) Feedback on strengths and weaknesses are given directly after the performance. (1) Research on the use of Mini-CEXs in the postgraduate setting has shown it is a valid way to measure progress. Barriers to its successful execution originated from tick-box attitudes, the misconception that it could be failed and a disregard of its benefit resulting in less time dedicated to providing feedback. (2,3) Studies found that comments were often devoid of any action plans, leaving postgraduates with little incentive to strive to improve. (4)

At present, there is inadequate research into the utility of the Mini-CEX for undergraduates. (5) It is critical that medical schools evaluate the use of the Mini-CEX to ensure fulfilment of its purpose in creating safe and competent doctors.

In Cardiff University, Mini-CEXs were introduced in 2013 to ensure early patient contact for students and a way to identify weaknesses in performance. They are used on placement from Year 3 through the platform MyProgress (MyKnowledgeMap). The documentation of Mini-CEX feedback changed from a paper-based format to MyProgress in 2018. Hence, data was now readily accessible, making it easier to conduct an exploratory study to acquire information on how Cardiff undergraduates use the Mini-CEX, alongside in-depth discussions on student perceptions.

Methods

Using a mixed methods approach ensured that the meaning behind the quantitative data was explored qualitatively to fully reflect students' personal experiences. Ethical approval was granted by Cardiff University's School of Medicine Research and Ethics Committee.

The data from 1060 Mini-CEX forms from the 2018/19 cohort of Year 3 students from their first block of placement (September – November) was analysed.

Certain areas were examined closely; these were chosen based on available postgraduate literature on form analysis. The topics included: number of Mini-CEXs completed by the students, the tick-box feedback table and grade of the assessor completing the form. Inductive content analysis of the free-text feedback box was undertaken using the software NVIVO 12 (QSR *International*). (6)

The results from the Mini-CEX form analysis informed the questions explored during three semi-structured student focus groups including student perceptions and suggested modifications to the forms. Participants from Years 3-5 were recruited using self-selection. Thematic Analysis of the focus group transcripts was undertaken, looking for repetitive patterns/themes within the data. (7)

Results

Below are the main results derived from the Mini-CEX form analysis:

- Students must complete at least 3 Mini-CEXs though are encouraged to undertake more. However, 134/279 (48.0%) students simply conducted the minimum.
- Students' performance is evaluated against 8 domains. The assessor ticks whether each domain was 'Excellent/Skillful', 'Proficient' or requiring 'Targeted-' or 'Significant Improvement'. Across all assessed domains, 'Excellent/Skillful', 'Proficient' was the modal response.
- 429/1060 (40.5%) of assessors were FY1 or FY2 doctors.
- 630 comments were generic, positive statements, for example, *"Excellent history"*. Only 57 comments represented specific action plans.

Figure 1 illustrates the themes generated from the focus groups. Theme 1 details how the Mini-CEX helped develop students' professional identity through medical school. This was achieved through skill acquisition; it allowed them to gain self-confidence, carry out jobs similar to a doctor and obtain good techniques to mirror within their own style.

The reasoning underpinning theme 2 was that students felt the lack of targeted written feedback on their performance and 'feedforward' stemmed from a lack of observation and time invested by the assessors. Furthermore, both parties deemed that receiving 'Targeted-' or 'Significant Improvement' warranted a fail of the Mini-CEX, thus showing a misunderstanding of the process, further contributing to unreflective feedback. The choice to complete the minimum was attributed to the possession of a tick-box mindset.

Within theme 3, the reason why certain assessors were chosen was explored. 3rd and 4th years were inclined to choose Foundation doctors, as more exam-focused tips were given to guide preparation for their finals.

Discussion

Previous research has discovered factors which can aid the development of a professional identity, for example, confidence, feeling involved in the clinical environment. (8) However, this was the first study to highlight the role of the Mini-CEX in assisting this development.

For both postgraduates and undergraduates, the lack of specific feedback is a major issue. (2, 9) In light of this study, a reason for this could be due to the Mini-CEX still being used as a summative exercise, echoing findings from published literature. (1, 10) Assessors may opt for generic statements even if improvement is recommended, as they do not want to be perceived as "failing" a student. As a 5th year student mentioned, *"it makes improvement like a bad thing"* emphasising that clarity needs to be sought.

One limitation included the small sample size leading to limited generalisability of findings. Further research is needed regarding assessors' perceptions of Mini-CEXs to tackle any misconceptions, with the hope that its learning potential would be recognised.

Suggestions for improvements to the forms have been implemented for 2020/21 due to this study.

Lessons Learnt

As I have not had any previous experience, having to conduct primary research was daunting. However, I was determined to not let this overshadow my feelings of excitement in undertaking a project which would have a direct impact on the curriculum for present and future medical students.

The limited timeframe posed a challenge; I was overambitious and tried to evaluate the feedback data from all three placement blocks of Year 3. I then reluctantly analysed only one placement block, though I was apprehensive of how this would affect my conclusions. In hindsight, with any piece of research there will be obstacles and I should know my limits and weigh up what is feasible whilst ensuring a high quality of results. I will now be aware of this hence will make plans accordingly from the outset.

I wish to continue my interest in Medical Education research and an extension of this project is currently in the pipeline looking into whether effective feedback on Mini-CEXs is related to educational continuity.

References

1. Rees CE, Cleland JA, Dennis A, Kelly N, Mattick K, Monrouxe LV. Supervised learning events in the foundation programme: a UK-wide narrative interview study. BMJ Open. 2014;4(10) [accessed 19 Nov 2020]. Available from: https://bmjopen.bmj.com/content/4/10/e005980 doi: 10.1136/bmjopen-2014-005980

2. Massie J, Ali JM. Workplace-based assessment: a review of user perceptions and strategies to address the identified shortcomings. Adv Health Sci Educ Theory Pract. 2016;21(2):455-73. doi: 10.1007/s10459-015-9614-0

3. Miller A, Archer J. Impact of workplace based assessment on doctors' education and performance: a systematic review. BMJ. 2010;341:c5064. doi: https://dx.doi.org/10.1136/bmj.c5064

4. Kipen E, Flynn E, Woodward-Kron R. Self-regulated learning lens on trainee perceptions of the mini-CEX: a qualitative study. BMJ Open. 2019;9(5) [accessed 19 Nov 2020]. Available from: https://bmjopen.bmj.com/content/9/5/e026796 doi: 10.1136/bmjopen-2018-026796

5. Nesbitt A, Baird F, Canning B, Griffin A, Sturrock A. Student perception of workplace-based assessment. The Clinical Teacher. 2013;10(6):399-404. doi: 10.1111/tct.12057

6. Downe-Wamboldt B. Content analysis: method, applications, and issues. Health Care Women Int. 1992;13(3):313-21. doi: 10.1080/07399339209516006

7. Braun V, Clarke V. 2012.Thematic analysis. In: Cooper H, Camic PM, Long L, Panter AT, Rindskopf D, Sher KJ, editors. APA handbook of research methods in psychology. American Psychological Association. https://doi.org/10.1037/13620-004

8. Weaver R, Peters K, Koch J, Wilson I. 'Part of the team': professional identity and social exclusivity in medical students. Med Educ. 2011;45(12):1220-9. doi: 10.1111/j.1365-2923.2011.04046.x

9. Weston PS, Smith CA. The use of mini-CEX in UK foundation training six years following its introduction: lessons still to be learned and the benefit of formal teaching regarding its utility. Med Teach. 2014;36(2):155-63. doi: 10.3109/0142159x.2013.836267

10. Lorwald AC, Lahner FM, Greif R, Berendonk C, Norcini J, Huwendiek S. Factors influencing the educational impact of Mini-CEX and DOPS: A qualitative synthesis. Med Teach. 2018;40(4):414-20. doi: 10.1080/0142159x.2017.1408901

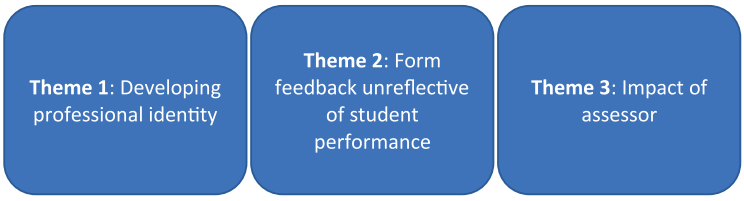


Figure 1: The 3 themes generated from thematic analysis of the focus group transcripts. Each theme tackles a different aspect of the students' perceptions of the Mini-CEX.

The British Student Doctor, 2020;4(3):19-21
doi: 10.18573/bsdj.197
C4ME Supplement

What resources do prospective medical school applicants want and use?

C4ME SUPPLEMENT

AUTHOR INFORMATION

Rhys Jones
Cardiff University School of Medicine

Dr Katie Webb
Cardiff University School of Medicine

Professor David Wilson
Cardiff University School of Medicine

Address for Correspondence:

Rhys Jones
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: JonesRT4@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://youtu.be/Gh_xi5qggWk

Background

Medicine was traditionally considered an elite profession studied by white, middle class men. (1) However, whilst progress towards equality has been noted in the representation of women and those from ethnic minority backgrounds, medical school places in the United Kingdom (UK) are predominately filled by students from high socioeconomic status (SES) backgrounds. (2)

Compared to other UK nations, Wales has proportionately fewer applications to medicine, (3) with many doctor posts vacant. (4) With research suggesting home-domiciled students are more likely to continue into postgraduate training in the same country, increasing application numbers from Wales could solve this problem. (4)

Applicants make use of many resources when researching a career in medicine. Resources can be defined as anything that may assist a potential applicant when applying to medicine, including school staff, family, friends and various fee-paying options. From admissions test revision courses to personal statement and interview advice, these demonstrate the commercialisation of the admissions process. As Wales has the highest levels of poverty in the UK, (5) widening access initiatives could be key. Current initiatives in place in Wales include the Welsh Government's Seren Network, which provides university application assistance to pupils with the highest GCSE grades, and local initiatives such as Cardiff University's Step-Up Scheme and the student-led Widening Access to Medicine Mentoring Scheme. However, there is a lack of data surrounding what prospective applicants find most useful when considering a career in medicine.

This project aimed to identify what resources prospective applicants use when applying to medicine and assess their perceived effectiveness, in order to facilitate the production of a future resource available to pupils of all SES backgrounds.

Methods

A mixed-methods approach was used collecting qualitative and quantitative data through questionnaires and focus groups. (6) Participants were pupils aged 16 to 18 from schools across South Wales with an interest in studying medicine as a career. Schools were categorised into high, low and no applicant groups according to the number of applications to medicine received by Cardiff University from 2014-17. Two schools were randomly chosen from each category.

A questionnaire was developed using JISC online surveys and distributed to pupils by a member of staff at each school to avoid collecting pupils' contact data. Responses informed development of the focus group topic guide.

Semi-structured focus groups were chosen to gather the opinions of the group of participants. Focus groups were audio recorded on school premises and later transcribed verbatim. Thematic analysis was employed to identify patterns in the data. (7) Data were double-coded and a coding framework was developed by members of the research team.

Ethical approval was obtained from Cardiff University School of Medicine Research Ethics Committee.

Results

Thirteen schools were contacted by email. Of those, six (46%) responses were received from members of staff reporting they had forwarded the invitation to participants. As the member of staff at each school forwarded the email to an unknown number of pupils, it was not possible to calculate a response rate. There were 18 questionnaire responses and nine participants across two focus groups (n=3 and n=6). Due to COVID-19 related school closures, it was only possible to hold two of the scheduled six focus groups.

Participants perceived medical students as the most valuable resource due to their relatability. Pupils with social capital such as friends and family members in the medical profession regarded these connections as extremely useful, especially when acquiring work experience. Participants without networks of contacts expressed finding experience, placements and information difficult.

Schools facilitate applications to medicine from pupils. Pupils perceived teachers as approachable and accessible but were aware of their limited knowledge of the process. Delivery of information regarding details of requirements to study medicine to facilitate adequate planning, subject choices and development opportunities was deemed an important influential factor. Participants described financial concerns and perceptions of medical students typically having a high SES background as pivotal in other pupils' decision to not apply to university. However, students presented with student finance information at an earlier stage were aware funding is readily available.

Pupils wanted a centralised resource with information including entry requirements and assistance with interviews. These perceived gaps in available information are available on the Medical Schools Council (MSC) website, (8) though no participants were aware of its existence when asked. Poor knowledge of this no cost resource is captured in a quote by participant 2.3f: *"Well, if I had known about it, definitely. It sounds useful. It just needs a lot more advertising in schools, because I've never heard of it"*.

Discussion

Widening access initiatives, including use of medical students, should continue in order to increase contact with low SES pupils who lack social capital, as there is currently inequity of opportunity. Access to work experience remains a key barrier to low SES pupils. (9) Evaluation of initiatives are missing but should be employed to examine their impact.

The range of resources that prospective applicants seek is available on the MSC website, yet awareness of such resources remains poor. (8) As such, production of a new resource may be unnecessary.

Improvements in advertisement and communication of existing MSC resources to pupils and school staff should be made. Teachers could more effectively inspire applicants if they are informed and upskilled in the process of applying to study medicine. Delivery of information to pupils at an earlier educational stage may increase aspirations in pupils of low SES that medicine as a career is achievable.

Whilst these methods will improve awareness of requirements of medicine courses, the impact of COVID-19 has meant that guidance on gaining work experience has led to change in the expectations of medical schools. (10) The new resources/advice is much more pragmatic and widens access to those from all SES backgrounds.

Lessons Learnt

As a former Welsh-domiciled applicant, this project was of personal interest. This was a new experience to me as for the first time in a research project I had insight into the experiences of many of the participants and was required to ensure I reflect on my own role, so as not to affect the data I was analysing.

There were difficulties, namely in contacting and recruiting schools to take part – email proved to be an inefficient and frustrating recruitment tool! Initial plans for six potential focus groups were squandered when the COVID-19 pandemic resulted in unexpected school closures before scheduled visits. Whilst this limited the range of schools from which I was able to collect data, I believe that my results are representative of the views of a very hard to reach group of participants in sixth form aged pupils.

Nevertheless, this project ingrained into me the importance of appropriate planning. Towards the end in particular, checklists and reminders ensured I not only accomplished what I set out to do but also separated the large task into manageable sections allowing me to track my progress.

References

1. Boursicot K, Roberts T. Widening participation in medical education: challenging elitism and exclusion. Higher Education Policy. 2009;22(1):19-36.
doi: 10.1057/hep.2008.35

2. Steven K, Dowell J, Jackson C, Guthrie B. Fair access to medicine? Retrospective analysis of UK medical schools application data 2009-2012 using three measures of socioeconomic status. BMC Medical Education. 2016;16(1):11 [accessed 14 Dec 2020].
Available from:
https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-016-0536-1.
doi: 10.1186/s12909-016-0536-1

3. Universities and Colleges Admissions Service. 2020 cycle applicant figures - October 15 deadline. 2020 [accessed 30 Mar 2020].
Available from: https://www.ucas.com/data-and-analysis/undergraduate-statistics-and-reports/ucas-undergraduate-releases/applicant-releases-2020/2020-cycle-applicant-figures-15-october-deadline

4. Royal College of Physicians (Wales). Physicians on the front line: the medical workforce in Wales in 2016. Cardiff: Royal College of Physicians (Wales); 2016.

5. Department for Work and Pensions: UK Government. Households below average income (HBAI) statistics. 2020 [accessed 31 Mar 2020]. Available from: https://www.gov.uk/government/collections/households-below-average-income-hbai--2

6. McKim CA. The value of mixed methods research: a mixed methods study. Journal of Mixed Methods Research. 2015;11(2):202-22. doi: 10.1177/1558689815607096

7. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3(2):77-101.
doi: 10.1191/1478088706qp063oa

8. Medical Schools Council. Home page. 2018 [accessed 26 Apr 2020]. Available from: https://www.medschools.ac.uk

9. Independent Reviewer on Social Mobility and Child Poverty. Fair access to professional careers: a progress report. 2012 [accessed 12 Apr 2020].
Available from: https://www.gov.uk/government/publications/fair-access-to-professional-careers-a-progress-report

10. Medical Schools Council. Guidance on gaining relevant experience to study medicine in the time of Covid-19. Medical Schools Council; 2020 [accessed 30 Jun 2020].
Available from: https://www.medschools.ac.uk/media/2636/guidance-on-gaining-relevant-experience-for-studying-medicine-in-the-time-of-covid-19.pdf

The British Student Doctor, 2020;4(3):22-24
doi: 10.18573/bsdj.195
C4ME Supplement

‘Lurker’ to learner: Encouraging collaborative learning using a scaffolding and peer assisted learning approach

C4ME SUPPLEMENT

AUTHOR INFORMATION

Eleanor Cochrane
Cardiff University School of Medicine

Professor Philip Smith
Cardiff University School of Medicine

Address for Correspondence:

Eleanor Cochrane
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: cochraneej@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 29.11.2020

Link to YouTube Video:
https://www.youtube.com/watch?v=07JabinXSV4

Background

Cardiff University School of Medicine is faced with a problem familiar to medical schools worldwide: motivating students to become deep learners rather than strategic or superficial learners.(1) Competition, commonly present in medical schools, (2) is also seen in the online collaborative learning platform, PeerWise. (3) PeerWise, a free online collaborative learning platform that allows a cohort of students to generate their own multiple-choice question (MCQ) bank, has been used at Cardiff Medical School since 2013. While the pedagogical underpinning of the platform is sound, there is concern that students are not using PeerWise to optimise deep learning. The gamification features may instead incite a competitive environment encouraging undesirable behaviours, namely ‘trolling’, (4) anonymous verbal abuse and ‘lurking’, (5) gaining from the ‘community of practice’ without contributing. This report uses an educational action research strategy to reflect on the delivery of PeerWise as a learning tool in the Cardiff medical curriculum and seek to improve engagement in order to promote deeper learning. Cardiff Medical School follows a case-based learning (CBL) curriculum, delivering 6 cases in Year 1. This is well-suited to consolidation of learning through use of PeerWise as students can write questions specific to their current case learning objectives.

Methods

We aimed to improve student engagement with question writing and commenting, using peer-led scaffolding to help students transition from 'lurkers' to learners and foster deeper learning. We hoped to achieve this through three objectives:

1. To conduct a literature search to evaluate learning with PeerWise.
2. To evaluate how Cardiff 1st year medical students use PeerWise at Cardiff.
3. To design and evaluate a pilot workshop with the aim to increase question writing and commenting on PeerWise.

This report describes two cycles of educational action research with a focus on quality improvement. Initially, we addressed the question: Does peer review help students write better quality questions on PeerWise?

In the second cycle, we extracted participation data from PeerWise for students enrolled in four of the Cardiff Year 1 courses during academic years commencing 2013 until 2018 (n= 1,272).

Finally, we designed an interactive workshop applying a scaffolding and peer assisted learning approach. Scaffolding describes the instructional technique of gradually guiding students towards greater understanding and independence. We used thematic analysis to analyse students' pre and post session questionnaires and reviewed questions which they authored in their workbooks.

Ethical approval was granted by the Centre for Medical Education, School of Medicine, Cardiff University.

Results

Preliminary Study

Although 40 Cardiff students consented to participate, only 13 enrolled in the PeerWise course. Eight students wrote 38 questions and 5 students wrote 25 peer review comments.

Those who submitted constructive and specific comments typically submitted their comments on distinct days, contrasting with those who submitted generic, brief comments. Students valued a good explanation, clarity and reference to resources but used a limited vocabulary to describe components of questions including: 'question', 'scenario', 'options' and 'explanation'. Most comments were only positive, without feedback for improvement. Positive questions were also shorter (64.3 characters) than the mean (129.6 characters).

Descriptive Data

The four Cardiff, Year 1 cohorts wrote 7,540 questions, answered questions 846,275 times, posted 1,276 comments and rated questions 432,997 times. Students wrote a median of 1 question but answered 485.5 questions. The 10 most prolific student authors represent 0.7% of the study population and collectively wrote 33.3% (2,803) of all questions.

Of all 6 cohorts (n=2081), collectively the 10 most prolific authors wrote 2803 questions and answered 16964 questions, the 10 most prolific question answerers wrote only 88 questions and answered 31315 questions. Only 16% of students (330) wrote six or more questions.

Workshop Feedback

Student perception of the peer-led scaffolding pilot workshop was overwhelmingly positive, and students expressed increased motivation to write more questions.

Discussion

Studies evaluating PeerWise commonly focus on the impact on summative performance, quality of questions produced and student perception. Summative assessment and scaffolding were the most common methods used to motivate engagement. (7, 8) Following the literature search it appears that our study presents the first evaluation of a scaffolding and peer assisted learning approach.

Approximately half of Cardiff medical students engage in question writing, while most engage in question answering. Writing questions may only benefit learning specific to the topic that their question examines. To be of benefit, our students may then need to write a minimum of one question per case yet few Cardiff students wrote the equivalent of one question per case in their CBL curriculum. Students typically write questions of low taxonomic grade, (8) indicating most Cardiff students may not be engaging in higher order thinking by only answering questions. (9)

The workshop was well received but would benefit from more examples of good questions and better description of the evidence behind writing questions. Students expressed they were likely to write more questions and felt more confident, equipped with a framework. They also have an improved perception of giving feedback to their peers. Our peer-led scaffolding workshop should be improved in line with student feedback and integrated (with continuing evaluation) into the current curriculum in order to promote deeper, more collaborative learning.

Lessons Learnt

Undertaking the research project has been an invaluable experience punctuated by challenges, which surprisingly strengthened the project. Upon receiving my project question, I was excited to begin since PeerWise is a platform that had benefitted me greatly in my medical studies. However, I quickly started to notice problems that would arise in the project proposal. For instance, I was aware that students would not fully engage with PeerWise until immediately prior to their summer exam meaning that vital data would not become available until after submission.

Learning from speedbumps and incorporating our findings into subsequent project stages meant that the research became very reflective. This led us to adopt the educational action research strategy, employing a holistic approach to identifying and addressing problems. It felt more valuable to address the problems that had arisen, rather than just work around them. Consequently, I learned the importance of students and faculty working collaboratively to find solutions as participant-researchers. This will support me to think critically about problems that arise in my studies and in clinical practice and ultimately becoming a more reflective practitioner.

References

1. Chonkar SP, Ha TC, Chu SSH, Ng AX, Lim MLS, Ee TX, et al. The predominant learning approaches of medical students. BMC medical education. 2018;18(1):17 [accessed 14 Dec 2020]. Available from: https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-018-1122-5.
doi: 10.1186/s12909-018-1122-5

2. Bjarne Skjødt W, Steen Vigh B. Does competition work as a motivating factor in e-learning? A randomized controlled trial. PLoS ONE. 2014;9(1) [accessed 29 Nov 2020]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0085434
doi: 10.1371/journal.pone.0085434

3. Denny P, Luxton-Reilly A, Hamer J. The PeerWise system of student contributed assessment questions. 2008. p. 69-74.

4. Walsh JL, Harris BHL, Denny P, Smith P. Formative student-authored question bank: perceptions, question quality and association with summative performance. Postgraduate medical journal. 2018;94(1108):97-103.

5. Duret D, Christley R, Denny P, Senior A. Collaborative learning with PeerWise. Research in Learning Technology. 2018;26:1-13. doi: 10.25304/rlt.v26.1979

6. Krathwohl DR. A Revision of Bloom's Taxonomy: An Overview. Theory Into Practice. 2002;41(4):212-8. doi: 10.1207/s15430421tip4104_2

7. Galloway KW, Burns S. Doing it for themselves: students creating a high quality peer-learning environment. Chemistry Education Research and Practice. 2015;16(1):82-92. doi: 10.1039/c4rp00209a

8. Bates S, Galloway RK, Riise J, Homer D. Assessing the quality of a student-generated question repository. Physical Review Special Topics Physics Education Research. 2014;10(2):020105. sdoi: 10.1103/PhysRevSTPER.10.020105

9. Bloom BS. Taxonomy of educational objectives, Book 2 Cognitive Domain. New York: McKay.

The British Student Doctor, 2020;4(3):25-27
doi: 10.18573/bsdj.198
C4ME Supplement

Face to face vs. blended learning: What are the relative merits?

C4ME SUPPLEMENT

AUTHOR INFORMATION

Caitlin Atkins
Cardiff University School of Medicine

Dr Marion McAllister
Cardiff University School of Medicine

Dr Stephen Greenwood
Cardiff University School of Medicine

Address for Correspondence:

Caitlin Atkins
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: AtkinsC@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://www.youtube.com/watch?v=VNl3f_6sHyo

Background

Cardiff University is one of just three UK Higher Education Institutions providing Level 7 vocational training for genetic counsellors - the academic qualification required for clinical practice. In 2017, in response to a developing market, Cardiff University changed their 2-year, full-time face to face (FTF) MSc Genetic Counselling (GC) degree to a 3-year, part-time, blended learning (BL) Genetic and Genomic MSc programme. BL programmes use a combination of traditional FTF teaching with a variety of online resources allowing students to complete modules from home. In this respect, Cardiff University has introduced an innovative approach to GC education.

Within the existing literature there is evidence that student satisfaction and overall outcomes are not diminished when using distance learning techniques. (1) This study will use qualitative methods to explore the engagement, satisfaction and perceptions of genetic counsellors who have been educated at Cardiff University through the FTF programme and the BL programme.

Methods

A recruitment video was sent to past and present students on the Genetic and Genomic Counselling MSC at Cardiff University via email and a closed Facebook group. Eligible students contacted the research lead and were sent the Participant Information Sheet and consent form, which were collected by the research lead prior to the participant being contacted by the researcher.

Ethical approval was obtained from the Cardiff University School of Medicine Research Ethics Committee (Ref. 18/71).

Eligible participants were those that had completed either the Genetic Counselling or currently on the Genetic and Genomic Counselling MSC at Cardiff University. Only those in their third year of the new Genetic and Genomic Counselling MSc were included due to having the most experience of the programme. There were 33 eligible students in total. From a group of 20 old FTF Genetic Counselling MSc graduates, 6 took part in this study (30% response rate) and from a group of 13 current BL Genetic and Genomic Counselling MSc students, 7 took part (54% response rate).

A qualitative approach was used to explore the thoughts and feelings of both sets of students regarding the two programmes. (2) Semi-structured interviews were used to allow participants to discuss different aspects of the programmes. (3) The interviews were conducted by the researcher over Skype or over telephone depending on the accessibility of participants. The transcripts were analysed using an inductive thematic approach. (4) Two transcripts were sent to the project lead for double coding.

Results

Participants discussed many benefits of BL, praising the flexibility of being able to undertake the programme remotely and also being able to complete tutorials at a time that suited them, which enabled them to optimise their focus. Other benefits of the BL programme included being able to keep their current job to aid with financial support, being able to revisit online content, having supportive staff and having valuable clinical placements. The main limitations of BL were identified as the high workload, difficulties with maintaining a work/life balance and technological glitches.

When discussing the old FTF programme, participants commended the ability to make strong bonds with peers through shared experiences of physically attending group teaching sessions. However, they also described the presence of 'dead time', like commuting and gaps between sessions, which was seen as a waste of their time. In addition, many found the programme to be a substantial commitment with regards to relocating and funding.

Participants from both groups offered potential improvements for the BL course, including introducing a 'Buddy' system, using more 'Ice Breakers' early in the course, being more upfront about the high workload and changing the dissertation year to close the gap between placement and beginning work.

Discussion

This study revealed valuable insights into the benefits and drawbacks of FTF and BL programmes, and highlighted areas for improvement in the newly implemented programme at Cardiff University. Students praised the peer and staff relationships and appreciated the flexibility and efficacy of the distance learning elements, whilst still benefitting from the more sensitive counselling training in the FTF blocks.

Overall, participants on the BL programme found that completing the course remotely increased their initial feelings of isolation, but felt that FTF blocks were effective in building strong connections with peers that allowed them to continue these friendships when they returned home. The constructive feedback for the BL programme is highly valuable for the purpose of exploring how to improve the delivery of the MSc to future cohorts and identifying the direction of future research that aims to maximise the efficacy and student satisfaction of BL programmes.

Lessons Learnt

In undertaking this research, I gained an appreciation of the importance of using student feedback to see the advantages and disadvantages of different learning programmes, to ensure both effective learning and student satisfaction. Furthermore, comparing and contrasting insights from each group meant I developed an understanding of how such a dramatic change in educational delivery can affect multiple aspects of learning experiences. Listening to participants' thoughts and experiences emphasised the importance of frequent and open student feedback and the value of this when organising an educational programme.

This research also highlighted the importance of using new interactive, collaborative technology alongside traditional educational methods to deliver a higher education degree. Having seen how well aspects of the BL programme have worked for the GC MSc, I feel that if more of these online learning platforms were incorporated into other courses at Cardiff University, it could greatly enhance the learning experience of their students.

Finally, this project has underlined how BL courses widen access to certain degrees, such as GC. Thus, BL not only allows people to learn remotely but also, part-time, alongside work and family commitments, which is especially significant given the current context of COVID-19 and the subsequent shift to remotely delivered higher education.

References

1. Allen M, Bourhis J, Burrell N, Mabry E. Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis. The American Journal of Distance Education. 2002; 16(2):83-97.

2. Maxwell JA. Designing a qualitative study. The SAGE handbook of applied social research methods. 2008; 2:214-53.

3. Peters K, Halcomb E. Interviews in qualitative research. Nurse Researcher (2014+). 2015;22(4):6.

4. Clarke V, Braun V, Hay#eld N. Thematic analysis. Qualitative psychology: A practical guide to research methods. 2015; 1:222- 48.

The British Student Doctor, 2020;4(3):28-30
doi: 10.18573/bsdj.203
C4ME Supplement

Reflective practice in the C21 curriculum

C4ME SUPPLEMENT

AUTHOR INFORMATION

Elizabeth Hodges
Cardiff University School of Medicine

Dr Zarabeth Newton
Cardiff University School of Medicine

Dr Elizabeth Metcalf
Cardiff University School of Medicine

Address for Correspondence:

Elizabeth Hodges
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: HodgesEL2@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 14.11.20

Link to YouTube Video:
https://www.youtube.com/watch?v=MegVfgH0Gbw

Background

Reflective practice (RP) contributes to the development of practising doctors, both professionally and personally. UK doctors must provide evidence of reflection in order to maintain registration, in accordance with General Medical Council (GMC) guidelines. (1) The GMC encourages students and professionals to utilise a wide variety of reflective tools, citing methods such as poetry, journal-writing and facilitated forums as examples. (2) Further literature demonstrates the plethora of reflective models and methods available, with variations continuing to develop as reflection is increasingly recognised for its role in patient care and medical professional wellbeing. (2, 3)

The GMC states RP is personal and there is "no set way" to reflect. Cardiff University's School of Medicine (CUSOM) takes a different approach, historically offering students one reflective approach within the MBBCh curriculum ('C21'); reflective writing. (2, 4) This creates a narrow scope of opportunity for students to explore their preferred reflective styles, limiting students during their medical education. CUSOM student perceptions on RP were last assessed in 2006, before introduction of the revised C21 curriculum in 2013. (5) Thus, the study aimed to gather student perceptions on current RP in C21 and establish how students wish to develop their RP during their medical education.

Methods

A mixed-methods approach was undertaken in order to gather and analyse students' perceptions on RP. Quantitative data was primarily collected from Likert-scaled responses within a questionnaire (OnlineSurveys). Qualitative data was captured from survey free-text responses and two subsequent focus groups, providing contextual insight to quantitative data.

The survey was distributed to all current Medicine MBBCh students at CUSOM (years 1-5, including intercalating students, n=1589) and remained open for four weeks. Students voluntarily self-selected to complete the survey and partake in focus groups. Quantitative data was analysed using SPSS software, and qualitative data was thematically analysed using NVivo software following Braun and Clarke's steps. (6)

Ethical approval from CUSOM's Research Ethics Committee was sought and approved on 28/11/2019. Other ethical considerations were upheld throughout, including adhering to data protection guidelines, maintaining of student confidentiality and anonymisation of data.

Results

Overall, 100 participants responded to the survey and 19 subsequently participated in focus groups. Students predominantly valued reflection for students and professionals, agreeing both parties should engage with RP (96% and 99% respectively).

Students rated reflective techniques. Most deemed verbal reflection superior; between 85-97% students perceived various verbal reflective techniques (peer/tutor-led, group/one-to-one discussions) as useful. Reflective writing within C21 was ranked 6th most useful (84%). Most students (85%) expressed desire for formal implementation of alternative reflective methods into their curriculum, particularly recommending introduction of explicit spaces for verbal RP.

Currently students are provided with numerical 'marks' for their reflections within C21. Many supported continuation of RP's assessment in order to encourage engagement with the process. However, most suggested the protocol be revised to a 'pass/fail' assessment, with recurring arguments referring to personal aspects of reflection and areas of subjectivity (between numerous assessors, varying student ability to write effectively etc.).

A lack of education on reflection, particularly relating to its role in revalidation and how best to gain from RP, was a recurring theme. Less than two thirds (62%) were aware the GMC actively encourages students and professionals to reflect in ways they prefer.

Additional recurring themes posed by students appeared to overlap and interplay (**Figure 1**). Most centered around the perceived value of RP, its problems, RP as an assessment and preferred current RP techniques versus proposed alternative methods.

Discussion

Students' perceptions generally reflected those illustrated in literature, particularly their understanding of reflection's value and role in promoting deeper learning, wellbeing, contextualising learning experiences and its contribution to patient care improvement. (2, 3, 7) However, students expressed lack of RP education. Greater understanding of the reflective process is linked to more effective learning, supporting students' recommendations for increased education. (8)

Students highlighted a lack of variety of reflective tools available to them, contrary to GMC recommendations. (2) Recurrent feelings of restriction contribute to RP's shift to a "tick-box exercise" – a sentiment echoed in literature. (9) Whilst reflective writing is promoted in C21, it is not necessarily the preferred reflective method implying students' reflective needs are not currently met. More can be done to accommodate individual learning styles. The complexity of RP assessment was acknowledged, but most agreed RP should remain summatively assessed to maintain engagement and "drive learning", mirroring similar studies. (5, 9) Students implied formative RP would lead to decreased student participation effectively limiting the potential benefits to be gained from reflection.

I thereby propose the following recommendations to CUSOM:

1. Increase RP education.
2. Introduce formal alternative RP methods and allow students to choose their preferred reflective styles.
3. Revise RP assessment (for example, modification to pass/fail), accommodating alternative RP methods.

Lessons Learnt

This study was my first experience of medical education research and mixed-methods data analysis. I encountered various personal challenges, however, persevered and ultimately developed transferrable research skills for my career.

I felt equally anxious and eager to begin. Researching RP indirectly led to a personal cycle of reflecting on reflection and I found myself discovering benefits. One particular challenge concerned my role as a medical student - I had opinions on RP with power to influence outcomes. I was conscious of introducing bias but attempted to minimise this by keeping a reflexive log.

I believe I achieved minimal influence, through initiatives such as avoiding leading questions and double coding data. Researcher bias is a common obstacle in studies of particular interest to their author and can reduce validity of results, particularly with qualitative research. (10) Steps can be implemented to reduce effects of this bias and ensure robust conclusions are drawn.

The project enabled me to develop research skills and gain greater understanding of the work involved in developing undergraduate medical curricula. I have personally realised reflection's value as an outlet and resource for professional and personal development.

I hope to build on this project and further explore the role of alternative RP techniques in C21. I plan on implementing reflective tools I have discovered, introducing reflection into more aspects of my life.

References

1. General Medical Council. Outcomes for graduates. London: GMC (UK); 2018.

2. General Medical Council. The reflective practioner: Guidance for doctors and medical students. London: GMC (UK); 2018.

3. General Medical Council, Medical Schools Council. Achieving good medical practice: guidance for medical students. London: GMC (UK); 2016.

4. Goodfellow R, Metcalfe E. MBBCh C21 Programme Assessment & Progression Guide. Cardiff: Cardiff University School of Medicine; 2019.

5. Grant A, Kinnersley P, Metcalf E, Pill R, Houston H. Students' views of reflective learning techniques: an efficacy study at a UK medical school. Medical Education. 2006;40(4):379-88.

https://doi.org/10.1111/j.1365-2929.2006.02415.x

6. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3(2):77-101.

https://doi.org/10.1191/1478088706qp063oa

7. Grant A, McKimm J, Murphy F. Developing Reflective Practice: A Guide for Medical Students, Doctors and Teachers. Hoboken, NJ: Wiley Blackwell; 2017.

8. Boud D, Keogh R, Waler D, Edwards R, Hanson A, Raggatt P. Boundaries of Adult Learning. Abingdon: Taylor & Francis; 2013.

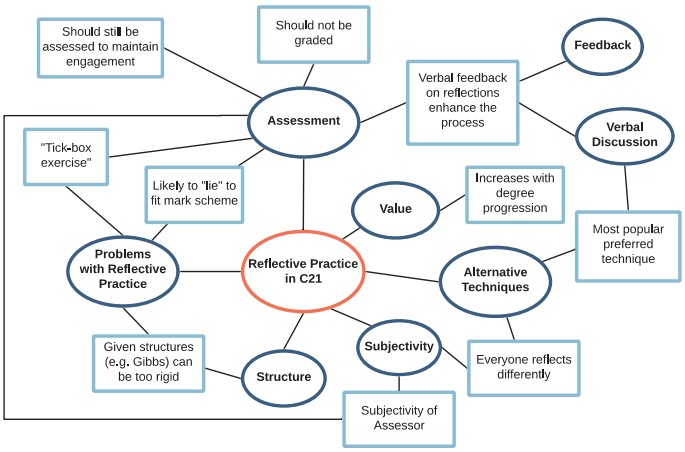
9. Furmedge D. Written reflection is dead in the water. BMJ. 2016;353:i3250.

https://doi.org/10.1136/bmj.i3250

10. Anderson C. Presenting and evaluating qualitative research. American journal of pharmaceutical education. 2010;74(8):141.

https://doi.org/10.5688/aj7408141

Figure 1: A summary of key themes drawn from collected data



The British Student Doctor, 2020;4(3):31-33
doi: 10.18573/bsdj.200
C4ME Supplement

The role of educational supervisors and their feedback in an undergraduate medical curriculum

C4ME SUPPLEMENT

AUTHOR INFORMATION

Isabelle Ray
Cardiff University School of Medicine

Dr John Green
Cardiff University School of Medicine

Dr Rhian Goodfellow
Cardiff University School of Medicine

Dr Emily Harrop
Cardiff University School of Medicine

Address for Correspondence:

Isabelle Ray
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: RayIE@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 18.11.20

Link to YouTube Video:
https://www.youtube.com/watch?v=Vk5u992RfSM

Background

In the UK, the General Medical Council formally approved Educational Supervisors (ESs) as postgraduate medical trainers in 2012. (1) ESs are trainers who provide guidance and feedback to trainees on professional, educational and personal matters. (1,2) Previous research has identified the desire for ESs to provide more constructive feedback. (3) Studies have also highlighted ES and trainee concerns, including negative attitudes towards educational supervision and how ES-trainee meetings are often time restricted. (3,4)

ESs are now included in some undergraduate medicine curricula. In Cardiff Medical School, students are currently allocated an ES for each clinical placement block starting from third year through to their final year of study. ESs support students throughout the placement block. They are asked to complete an ES report (ESR) collating evidence from the student's Supervised Learning Events (SLEs), including observed histories and examinations, in order to formulate a final feedback summary.

However, supervision is a component of medical education that is under-researched and under-supported, despite its undeniable importance in training. (2) Most research investigating educational supervision has been conducted in the postgraduate setting using both quantitative and qualitative methods. (3,4) There is little research studying educational supervision in undergraduate medical training.

Methods

The project aims were to investigate the perceptions of both Cardiff medical students and ESs on the ES role and the feedback that ESs provide. Therefore, a qualitative approach was adopted to explore participants' views on these topics, using focus groups (FGs) and semi-structured interviews. A literature review, quantitative analysis of 895 anonymised ESR forms and discussions with my supervisors helped to inform interview and FG questions. Student participants were recruited for FGs from the fourth- and fifth-year medical school cohorts, as they would have experienced at least one year of educational supervision. ES participants were recruited for interviews through the undergraduate department of one local health-board.

NVivo 11 software was used for data analysis. Initially, the data was coded deductively, using an a priori template, according to the project's aims considering the ES role and ES feedback. (5) The data was then thematically analysed where codes were developed inductively in order to reach the final themes. (6) 20% of the data was double coded by one of my supervisors to ensure rigorous analysis.

The School of Medicine's research and ethics committee approved the project's ethics. Participants were informed about the study, their participation and data management. Preparations were made in case participants became upset during data collection.

Results

The final themes considered both students' and ESs' opinions from two student FGs (n=15) and six ES interviews (n=6).

Four themes related to the ES role: educational guidance; pastoral support; time; and inconsistency. A key finding was that 14/15 students valued ES accessibility, who explained that this allows ESs to successfully provide educational and personal support. However, this is not always achieved. Students and ESs raised concerns with the short placement blocks, meaning there is limited time for ES-student relationships to develop. Additionally, four ESs and nine students described inconsistent and variable approaches to supervision, with feelings of uncertainty surrounding the role's requirements.

Three themes related to ES feedback: its perceived value; its formulation; and Multi-Source Feedback (MSF). Most student and ES participants believed the current ESR form to be a 'tick-box' exercise. ESs rely heavily on written feedback in students' SLEs, which is often lacking in content, as ESs do not regularly observe students clinically. This therefore impacts the feedback that ESs can give students, meaning their feedback is often non-specific, which students do not find useful for future learning.

Discussion

This study highlighted that undergraduate ESs are recognised as having a vital role in supporting students' learning and personal needs, with some ESs meeting student needs better than others. Guidance should be circulated regularly to ensure ESs are appropriately supported and understand the role's requirements.

Most participants commented on the lack of time for meetings given ESs' already busy work schedules. This finding is consistent with previous postgraduate research, which has also revealed that trainees find educational supervision meetings to be time constricted. (4,7) In 2020/21, one ES will be allocated to each third-year Cardiff student for the entirety of year three (with local clinical supervisors at each placement site) to improve supervisor continuity and relationship development.

Both students and ESs wanted opportunities for ESs to be given feedback. MSF successfully identifies postgraduate ESs' strengths and weaknesses. (8) Therefore, forms could be created for Cardiff students to complete which are then reviewed by the medical school to ensure current ESs consistently fulfil role requirements.

It is understood this project is the first to investigate student and ES opinions on components of educational supervision. Caution should be exercised interpreting the results given the inherent participant biases as all were volunteers. However, this project has provided an important insight into the undergraduate ES role and feedback, and how the Cardiff educational supervision system might be altered.

Lessons Learnt

It was a challenging yet rewarding experience to design and conduct my research project in a narrow timeframe. My literature search revealed a paucity of research investigating educational supervision in medical schools. Therefore, I initially struggled to formulate the interview and FG questions.

It was important to take a reflective approach to this project, as I am a medical student who has previously experienced educational supervision. I recognised I might possess sub-conscious views on this topic that could have impacted data collection and analysis. Consequently, I ensured to standardise my approach during data collection by using set question lists, reflecting on my thoughts during analysis and discussing arising themes with my supervisors to validate findings. (9,10)

I felt motivated to uncover participants' perceptions of the ES role and opinions on ES feedback in order to understand what they believe is currently done well and what might be improved. I believe using both ES and student participants provided balance to the final themes. This project has given me vital research experience and has allowed me to present suggestions for curriculum change concerning educational supervision to relevant members of Cardiff Medical School's faculty.

References

1. General Medical Council. Recognition and Approval of Trainers. London: GMC (UK); 2012 [accessed: 20 Mar 2020]. Available from: https://www.gmc-uk.org/education/how-we-quality-assure/postgraduate-bodies/recognition-and-approval-of-trainers.

2. Kilminster S, Cottrell D, Grant J, Jolly B. AMEE Guide No. 27: Effective educational and clinical supervision. Medical Teacher. 2007;29(1):2-19.

3. Patel P. An evaluation of the current patterns and practices of educational supervision in postgraduate medical education in the UK. Perspectives on Medical Education. 2016;5(4):205-14.

https://dx.doi.org/10.1007/s40037-016-0280-6

4. Castanelli DJ, Weller JM, Chander AR, Molloy EK, Bearman ML. A balancing act: The Supervisor of Training role in anaesthesia education. Anaesthesia and Intensive Care. 2019;47(4):349-56.

5. Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International Journal of Qualitative Methods. 2006;5(1):80-92.

6. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3(2):77-101.

7. Tasker F, Newbery N, Burr B, Goddard AF. Survey of core medical trainees in the United Kingdom 2013–inconsistencies in training experience and competing with service demands. Clinical Medicine. 2014;14(2):149.

8. O'Keeffe C, Swanwick T, Archer J, Smith D. Multi-source feedback for postgraduate medical educational supervisors: A qualitative analysis of free text responses. Medical Education (Supplement). 2011;45(SUPPL. 2):56.

http://dx.doi.org/10.1111/j.13652923.2011.04093

9. Bell J. Doing Your Research Project: A guide for first-time researchers. Berkshire, England: McGraw-Hill Education (UK); 2014.

10. Barbour RS. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? BMJ. 2001;322(7294):1115-7.

The British Student Doctor, 2020;4(3):34-36
doi: 10.18573/bsdj.205
C4ME Supplement

Students' transition to doctor: exploration through visual and qualitative methods

C4ME SUPPLEMENT

AUTHOR INFORMATION

Naseera Seedat
Cardiff University School of Medicine

Dr Katie Webb
Cardiff University School of Medicine

Professor Stephen Riley
Cardiff University School of Medicine

Address for Correspondence:

Naseera Seedat
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: SeedatN@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 23.11.20

Link to YouTube Video:
https://youtu.be/dMSOAU2EhbY

Background

The NHS is experiencing increasing demand due to an aging population, rise in co-morbidities and increasing patient expectations, (1) leading to a stressful and challenging environment for newly-qualified doctors. This pressurised environment can be overwhelming, resulting in emotional exhaustion and burnout. (2)

The fundamental aim of any medical school is to ensure their graduates are fully prepared to face these challenges. The GMC released 'Tomorrow's Doctors' to outline the requirements of students by the time they graduate, easing the transition to doctor. (3) In response, Cardiff Medical School made changes to its MBBCh course resulting in the launch of C21 in 2013; this included a spiral curriculum and cased-based learning. (4)

Despite medical education reforms, graduates continue to find the transitional period challenging. (5,6) Having adequate knowledge and skills is insufficient; students need to be confident and empowered individuals – aspects that relate to a person's principles and qualities, their identity. The identification with the profession may help students to practice as self-assured doctors (7) and so this study aimed to explore students' sense of identity in relation to preparedness for practice and transition to newly-qualified doctor.

Methods

A mixed-method approach, comprising of qualitative semi-structured focus groups/interview and visual methods was used. Visual methodology complemented focus groups/interview by limiting social desirability bias and initiating idea formation. Data were collected from four groups of medical students at Cardiff University: fifth year, fourth year, fourth year students who took part in the Rural Education Route (RER), a longitudinal clerkship (LIC), and intercalating students. Year 4 students were separated by those who took part in the RER-LIC, as they spent their third year integrated and attached to one General Practice (GP) from which they entered a hospital for placement intermittently.

Participants recruited through emails, convenience sampling and snowballing, attended workshops. The first part of the workshop included a Lego® building session, requiring students to build and write descriptions of models to questions surrounding identity and preparedness for practice through the use of metaphors. This technique allowed students to think independently with time to reflect. Metaphors have been evidenced to add an additional level of depth to what is being said. (8) Participants then proceeded into a focus group/interview where questions, derived from my literature search, relating to preparedness and identity were further explored.

The Lego® model descriptions and focus group/interview transcripts underwent thematic analysis; 20% of data were dual-coded with a coding framework developed jointly.

Ethical approval was granted by the local research committee.

Results

Data were collected from 27 participants and 8 themes were identified: Attributes of a 'good doctor'; identity; feeling prepared; feeling unprepared; becoming a newly-qualified doctor; role/position in the system and improvements.

Participants felt more prepared for some areas of work compared to others. It was frequently voiced that students felt adequately prepared for communicating with patients and daily ward duties. Most students felt less prepared for acute emergencies, weekends and night shifts. Furthermore, students acknowledged the life of a newly-qualified doctor to be challenging with particular concerns regarding lack of support, workload and achieving a work-life balance.

Most students expressed experience to be an influence for both their professional identity development and feelings of preparedness. Some students accepted that they may never feel fully prepared and placed importance on learning on the job, where they could learn from their successes/mistakes. RER-LIC students found being attached to one GP allowed them to feel part of the team and the increasing responsibilities they were given throughout the year aided their perceived preparedness and identification with the profession.

All participants identified with being a medical student as opposed to a doctor-in-training. It was further suggested that there were check-points, such as passing final examinations and graduating, students needed to reach before they could further develop their professional identity. Additionally, students described hobbies outside of work which were considered important to keep separate from medicine to help achieve a work-life balance.

Discussion

Findings indicated that students identified as being more of a medical student than a doctor, but congruous with the literature, they highlighted viewing their identity as an evolving process (7) that would continue to develop after they graduated.

Experience was found to be a pivotal factor for the development of students' professional identity. It has been recognised that giving students a role closer to that of a doctor, helps them to develop a stronger identification with the medical profession. (7) From our research, this was evidenced by the RER-LIC students as they were able to have more experiences closely reflecting that of a Foundation doctor and resultantly they felt better prepared, as well as fostering a stronger professional identity.

Students partitioned certain parts of their identity to be separate from work, resulting in the creation of multiple identities that could be activated depending on the situation. (9) These separate identities were required to achieve a work-life balance and means through which they could ameliorate stress. Furthermore, to aid this, future sessions created on time management, prioritisation and coping strategies may be beneficial in helping students deal with the immense workload they will have, preventing future burnout.

Lessons Learnt

Prior to this year, I had minimal experience with qualitative research and so I was initially apprehensive to commence this project. Utilising a novel methodology also presented challenges as there were limited papers to refer to for guidance on how to collect the data.

Due to students being on placement and Year 5 students leaving for their electives, the recruitment process was more difficult than expected. However, after some perseverance, enough participants were recruited through snowballing and convenience sampling. In hindsight, to prevent stress, I should've started the recruitment process earlier to give myself more time to organise workshops.

My limited previous exposure to qualitative methodology meant I initially struggled with analysing my data and grasping the concept of thematic analysis. After guidance from my supervisor, time and determination I managed to get to grips with the technique, allowing me to sort and understand the data collected.

In conclusion, this process has been a rewarding process allowing me to appreciate the advantages of qualitative research and widen my skillset for future research.

References

1. Greenaway D. Shape of Training: Securing the future of excellent patient care. London: GMC (UK); 2013 [accessed 25 Feb 2020].
Available from: https://www.gmc-uk.org/-/media/documents/shape-of-training-final-report_pdf-53977887.pdf.

2. General Medical Council. National training Surveys 2019: Initial findings report. London: GMC (UK): 2019 [accessed 22 Feb 2020].
Available from: https://www.gmc-uk.org/-/media/gmc-site-images/about/national-training-surveys-initial-findings-report-20190705_2.pdf?la=en&hash=8455783A3C4DE2CC55A38ACB9ACF5D0B391744B0.

3. General Medical Council. Tomorrow's Doctors. London: GMC (UK); 2009 [accessed 18 Jan 2019].
Available from: http://www.ub.edu/medicina_unitateducaciomedica/documentos/TomorrowsDoctors_2009.pdf.

4. Cardiff University. C21 medical programme. Cardiff; Cardiff University School of Medicine; 2020 [accessed 29 Jun 2020].
Available from: https://www.cardiff.ac.uk/medicine/courses/undergraduate/medicine/c21.

5. Hannan E, Breslin N, Doherty E, McGreal M, Moneley D, Offiah G. Burnout and stress amongst interns in Irish hospitals: contributing factors and potential solutions. Irish Journal of Medical Science. 2018;187(2):301-7.

https://doi.org/10.1007/s11845-017-1688-7

6. Rich A, Viney R, Needleman S, Gri%n A, Woolf K. 'You can't be a person and a doctor': the work–life balance of doctors in training—a qualitative study. BMJ Open. 2016;6(12) [accessed 14 Dec 2020]. Available from:
https://bmjopen.bmj.com/content/6/12/e013897.long.

https://doi.org/10.1136/bmjopen-2016-013897

7. Monrouxe LV. Identity, identification and medical education: why should we care? Medical Education. 2010;44(1):40-9.

8. Gauntlett D. Creative Explorations: New approaches to identities and audiences. London: Routledge; 2007.

9. Van den Broek S, Querido S, Wijnen-Meijer M, van Dijk M, ten Cate O. Social Identification with the Medical Profession in the Transition from Student to Practitioner. Teaching and learning in medicine. 2020:1-11.

https://doi.org/10.1080/10401334.2020.1723593

The British Student Doctor, 2020;4(3):37-39
doi: 10.18573/bsdj.204
C4ME Supplement

The effect of healthcare provider support and discrimination on LGBT patients' trust and adherence

C4ME SUPPLEMENT

AUTHOR INFORMATION

Lydia May Haig Guest
Cardiff University School of Medicine

Dr Netta Weinstein
Cardiff University School of Biosciences

Address for Correspondence:

Lydia Guest
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: GuestLM3@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 18.11.20

Background

There are many disparities that the lesbian, gay, bisexual, and transgender (LGBT) community faces within the healthcare system. Members of the LGBT community are at higher risk of a number of physical health conditions than the general population. (1, 2) LGBT men and women have poorer mental health and higher rates of cigarette smoking, alcohol consumption and illicit substance use than the general population. (2, 3) Transgender individuals are not having their specific healthcare needs met because many healthcare providers do not have satisfactory knowledge and specialist services are concerningly overwhelmed, with unacceptably long waiting times. (4) Members of the LGBT community are more likely to avoid seeking healthcare than the general population and LGBT patients are more likely to ignore healthcare provider advice. (1) As well as poorer health seeking behaviours the LGBT community has lower medical adherence than the general population. (5) These health and health behaviour disparities are due, at least in part, to the stigma associated with sexual and gender minority status. A Stonewall report found that 14 percent of LGBT people avoided seeking healthcare due to fear of discrimination. (6) In the general popualtion, patients who are properly supported by their doctors tend to have better outcomes. (7) It is likely that support improves overall health through a number of different mechanisms, one of these being that supporting patients facilitates greater trust and ultimately greater adherence. (8) However, there is a paucity of research into the effects of support on LGBT patients.

This project examines the effects of healthcare provider support and discrimination on LGBT patients' trust and adherence. It compares the effect of support and discrimination and compares how they affect trust and adherence at key events.

Methods

633 LGBT participants, aged 21-82, completed an online questionnaire about their experiences in healthcare (operationalised as0 support and discrimination) and their own healthcare behaviours (operationalised as adherence and trust). To assess support, we asked participants if their healthcare providers had adequate knowledge of LGBT needs and if they were able to create a positive environment, and to assess discrimination we asked participants about negative reactions or treatment from healthcare providers as a result of their sexual/gender identity. Ethical approval was received from Cardiff University Ethics committee. Participants were asked about their experiences and behaviours at three distinct events; the first time they revealed their sexual/gender identity to a healthcare provider, a time when they concealed their sexual/gender identity to a healthcare provider, and the most recent time they revealed their sexual/gender identity to a healthcare provider within the last year. In addition, participants answered the questions regarding trust and adherence by thinking about their opinions towards healthcare providers in general. Regression models were used to examine if and to what degree the variables support and discrimination were able to predict the two outcome variables, trust and adherence.

Results

Regression analysis when patients revealed their gender identity

Support was a significant positive predictor of both trust and adherence the first time that participants came out to a healthcare professional and the most recent time participants came out to a healthcare professional (**Table 1**). Discrimination was a significant negative predictor of both trust and adherence the first time that participants came out to a healthcare professional and the most recent time participants came out to a healthcare professional.

Regression analysis when patients concealed their sexual/gender identity

Support was a significant positive predictor of both trust and adherence when participants concealed their sexual/gender identity to a healthcare professional. Discrimination was not a significant predictor of trust or adherence when participants concealed their sexual/gender identity to a healthcare professional.

Regression analysis of trust and adherence in general

Support was a significant positive predictor of general trust and adherence (**Table 1**). Discrimination was a significant negative predictor of general trust and adherence.

Discussion

These results support the current literature that shows that discrimination has a negative effect on LGBT patients' trust and adherence. These results also demonstrate that support has a positive effect on LGBT patient's trust and adherence, in line with literature relating to the general population. These results suggest that support is more important for improving LGBT patients' trust and adherence than lack of discrimination. In order to support LGBT patients, healthcare providers need a good understanding of the specific health needs of LGBT patients as well of how to create a safe space and make LGBT patients feel comfortable. (9) Despite this, LGBT health and cultural competency is not widely included as part of medical education courses. (10) The findings also draw attention to the lasting effect that the experience someone has the first time that they come out to a healthcare professional can have. LGBT education should not be optional for healthcare providers; it is important that they are able to provide LGBT patients with good experiences before and the first time they choose to come out. Although the first time that patients come out is an important event and continues to influence them in the future, the way they are treated after this also impacts trust and adherence. Therefore, a bad experience can to some extent be mitigated by support moving forwards. Similarly, it is not enough to only support LGBT patients initially, continued support is required to ensure improved outcomes.

Lessons Learnt

Before undertaking this project, I had never used a statistical package before, and I was nervous about having to use one, SPSS, to run the regression analysis. I attended a session run by the library which introduced me to the basics of SPSS and helped build my confidence. After this I set up a couple of meetings with my supervisor in order to build on these skills and learn the specific skills I needed for this project. Breaking up the sessions with my supervisor into more manageable chunks meant I could practice what we had gone over each time, take note of issues that I encountered, and bring these up at the next meeting. Many of these skills can be applied to other software packages and any future research that I do. .

References

1. Institute of Medicine (US) Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities. The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding. Washington D.C.: The National Academies Press; 2011.

https://doi.org/10.17226/13128

2. Rice C, Vasilenko S, Fish J, Lanza S. Sexual minority health disparities: an examination of age-related trends across adulthood in a national cross-sectional sample. Annals of Epidemiology. 2019;31:20-5.

3. Eaton NR. Transdiagnostic psychopathology factors and sexual minority mental health: Evidence of disparities and associations with minority stressors. Psychology of Sexual Orientation and Gender Diveristy. 2014;1(3):244-54.

4. Turban J, Winer J, Boulware S, VanDeusen T, Encandela J. Knowledge and attitudes toward transgender health. The Clinical Teacher. 2018;15(3):203-7.

5. Smalley KB, Warron J, Barefoot K, Nikki. Differences in Health Risk Behaviors Across Understudied LGBT Subgroups. Health Psychology. 2016;35(2).

6. Somerville C. Unhealthy Attitudes. London: Stonewall; 2015 [accessed: 18 Nov 20]. Available from: https://www.stonewall.org.uk/resources/unhealthy-attitudes-2015.

7. Stewart M, Brown J, Donner A, McWhinney A, Oats J, Weston W, et al. The Impact of Patient-Centered Care on Outcomes. Family Practice. 2000;49(9): 796-804.

8. Street R, Makoul G, Arora N, Epstein R. How does communication heal? Pathways linking clinician–patient communication to health outcomes. Patient Education and Counseling. 2009;74(3):295-301.

9. Mehta S. Making the healthcare needs of LGBT patients a priority. Primary Health Care. 2017;27(4):30-3.

https://doi.org/10.7748/phc.2017.e1233

10. Talan A, Drake C, Glick J, Claiborn C, Seal D. Sexual and Gender Minority Health Curricula and Institutional Support Services at U.S. Schools of Public Health. Journal of Homosexuality. 2017;64(10):1350-67.

Table 1: Regression analysis of support and discrimination predicting either trust or adherence

	β	*t*	*p*
Dependent variable: first trust			
First support	.36	5.75	<0.001
First discrimination	-.33	-5.18	<0.001
Dependent variable: first adherence			
First support	.54	9.85	<0.001
First discrimination	-.24	-4.35	<0.001
Dependent variable: recent trust			
Recent support	.51	8.86	<0.001
Recent discrimination	-.34	-5.85	<0.001
Dependent variable: recent adherence			
Recent support	.57	10.10	<0.001
Recent discrimination	-.27	-4.66	<0.001
Dependent variable: general trust			
First support	.29	5.12	<0.001
Recent support	.25	4.43	<0.001
Dependent variable: general trust			
First discrimination	-.29	-4.85	<0.001
Recent discrimination	-.22	-3.93	<0.001
Dependent variable: general adherence			
First support	.32	5.97	<0.001
Recent support	.30	5.52	<0.001
Dependent variable: general adherence			
First discrimination	-.31	-5.88	<0.001
Recent discrimination	-.30	-5.51	<0.001

The British Student Doctor, 2020;4(3):40-42
doi: 10.18573/bsdj.186
C4ME Supplement

Service evaluation of the paediatric thermal injury booklet in an emergency department in a tertiary centre

C4ME SUPPLEMENT

AUTHOR INFORMATION

Eilis Frances Wardle
Cardiff University School of Medicine

Dr Hannah Murch
Cardiff University School of Medicine

Address for Correspondence:

Miss Eilis Wardle
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: WardleEF@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 18.11.20

YouTube Summary:
https://www.youtube.com/watch?v=y0ixtBQ7ktU

Background

An estimated 25000 children present with burns and scalds annually in England and Wales. (1) Of all paediatric injuries, burns are associated with the longest hospital stay and extensive wound care and follow-up. (2) The significant burden of burns means that research in this area is essential.

Assessing burns is challenging. Total body surface area (TBSA) calculation and depth assessment guide referral decisions and fluid resuscitation. These assessments vary between clinicians and are generally inaccurate, particularly in children. (3, 4) Inflicted burns account for 8-20% of cases but asking questions about non-accidental injury (NAI) can be difficult. (1)

Accurate assessment guides decision making, from discharge home with red flag advice, to specialist referral and fluid resuscitation. Proformas have been associated with improved documentation in the ED. (5) The Paediatric Thermal Injury Booklet (Burns Booklet) was developed by a group of clinicians within a tertiary hospital and introduced to its ED in October 2014 to support comprehensive assessment and its documentation.

The aim of this project was to evaluate the Burns Booklet by comparing documentation of assessment before and after this intervention. If the booklet is successful, it may be escalated nationally.

Methods

Children presenting to the ED with burns in February to April 2013 (n=50) and February to April 2019 (n=50) were included. As this study evaluates documentation rather than clinical details, exclusion criteria were not required, and convenience sampling was used. Patients from 2013 formed the non-proforma group. Patients from 2019, where the Burns Booklet was utilised, formed the proforma group. Ethical approval was not required. Access to the booklet is available from the references. (6)

Notes were assessed by a single reviewer for clear documentation of safeguarding considerations; history of injury; physical assessment and safety-netting advice. Domains were scored as 'documented' or 'undocumented'.

Pearson's chi-squared test was used to test statistical significance for each domain. Values were considered statistically significant if $P \leq 0.05$. All values are stated to 3 significant figures.

A meeting was also arranged with ED consultants, where results were shared. Suggestions for modifications to the booklet were discussed.

Results

Safeguarding

Documentation of the clinician checking the child's previous attendances increased by 82% (P <.0001). Documentation of the child protection register (CPR) being checked increased by 62% (P <.0001). Documentation of safeguarding considerations increased by 32% (P <.0001).

History

Documentation of presence of another person in the vicinity at the time of the burn increased by 74% after the booklet was introduced (P <.0001). There was a 4% decrease in documentation of agent (P =.153). There was also an 8% decrease in documentation of mechanism (P =.140). These results were not statistically significant.

Physical Assessment

Use of the Lund and Browder chart to calculate TBSA increased by 26% (P <.001). There was a 4% decrease in documentation of anatomical site which was not statistically significant (P =.153). Documentation of erythema and blisters increased by 40% (P <.0001). There was also a 90% increase in documentation of a 'Wet, pink' appearance (P <.0001) and an 88% increase in documentation of a 'Dry, White or Charred' appearance (P <.0001).

Safety-netting

Documentation of safety-netting increased by 74% (P <.0001).

Discussion

In the Burns Booklet, clinicians are prompted to check the CPR and ask about who was present at the time of injury, so more at-risk children can be identified.

The checklist-style layout of the booklet also supports good documentation of the assessment of the burn itself. For example, documenting "pertinent negative findings" is of particular importance in depth assessment. (7) Only 3.5% of paediatric burns are full thickness, therefore the associated features are seen less frequently. (1) In the non-proforma group, where notes are written out, the absence of such findings is rarely documented. As depth assessment varies between clinicians, this proforma may also improve consistency. (4)

The Lund and Browder chart reduces variability in TBSA calculation. (8) A 26% increase in its use is therefore likely to result in more appropriate referrals and fluid resuscitation.

Safety-netting is an essential component of safe discharge as patients presenting early may not yet have developed complications. (9) Provision of red flag advice will empower parents to monitor their child's health and reduce workload in the ED by promoting discharge.

Better documentation with the booklet also means that in the event of a complication and therefore scrutiny of the primary ED assessment, the clinician is better protected legally. (10)

Though not statistically significant, the booklet resulted in poorer outcomes in some domains. This may be addressed by training clinicians in using the proforma.

Thus, by standardising assessment of the burn as well as the patient's individual risk factors to inform management and discharge advice, the booklet shows clear success. We therefore recommend that it should be adapted for national use, with the end goal of standardised comprehensive assessment of children with burns across Wales.

Lessons Learnt

Description

This project initially involved learning about burns assessment, histopathology and how burns affect bodily systems. Gathering results involved evaluating patient notes, identifying presence of key documentation and using statistical tests to measure significance.

Feeling

Wider reading was enjoyable as the learning could be applied clinically. At times, using the data was frustrating. I was focusing on documentation despite collecting extensive information on clinical findings. Using statistical analysis was satisfying as it reinforced the results.

Evaluation

Producing a report with important results was a good experience overall. Although the limited word count meant that secondary outcomes could not be discussed in detail, they provided useful context.

Analysis

In order to utilise the additional data, the project aim could have been amended, however, there are already many studies into the demographics of paediatric burns. The aim of this project was unique and directly impacts practice.

Conclusion

The project was relevant and interesting, with a clear positive outcome for patients and staff.

Action

In future, I will do a pilot of data collection to ensure the initial spreadsheet is appropriate and only relevant data is collected. I look forward to continuing with this project, ensuring an All-Wales Paediatric Thermal injury booklet is established.

References

1. Kemp A, Jones S, Lawson Z, Maguire S. Patterns of burns and scalds in children. Archives of Disease in Childhood. 2014;99(4):316.

2. Herndon D. Total Burn Care. Texas: Elsevier; 2017.

3. Chan Q, Barzi F, Cheney L, Harvey J, Holland A. Burn size estimation in children: still a problem. Emerg Med Australas. 2012;24(2):181-6.

4. Devgan L, Bhat S, Aylward S, Spence R. Modalities for the assessment of burn wound depth. Journal of Burns and Wounds. 2006;5:e2-e.

5. Lorenzetti DL et al. Strategies for improving physician documentation in the emergency department: a systematic review. BMC Emerg Med. 2018;18(1):36.

6. UHW Paediatric Emergency Department. Paediatric Thermal Injury Booklet. Cardiff: Cardiff & Vale University Health Board; 2014 [accessed 18 Nov 2020]. Available from: https://cf-my.sharepoint.com/:w:/g/personal/wardleef_cardiff_ac_uk/EYFvTrW2pF1LlGjXGL65y64B8KxSRXfmtUw3t5lidwZkUg?e=QbJi6w.

7. Mathioudakis A, Rousalova I, Gagnat A, Saad N, Hardavella G. How to keep good clinical records. Breathe (Sheff). 2016;12(4):369-73.

8. Wachtel T, Berry C, Wachtel E, Frank H. The inter-rater reliability of estimating the size of burns from various burn area chart drawings. Burns. 2000;26(2):156-70.

9. Almond S, Mant D, Thompson M. Diagnostic safety-netting. Br J Gen Pract. 2009;59(568):872-4.

10. Pullen I, Loudon J. Improving standards in clinical record-keeping. Advances in Psychiatric Treatment. 2006;12(4):280-6.

The British Student Doctor, 2020;4(3):43-45
doi: 10.18573/bsdj.194
C4ME Supplement

Association between adverse childhood experiences and a later combination of psychosis and interpersonal violence

C4ME SUPPLEMENT

AUTHOR INFORMATION

Jasmin Ranu
Cardiff University School of Medicine

Natasha Kalebic
Cardiff University

G.J. Melendez-Torres
University of Exeter

Professor Pamela J Taylor
Cardiff University

Address for Correspondence:

Jasmin Ranu
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: ranuj@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 22.11.20

Background

Adverse childhood experiences (ACEs) have been defined as "potentially traumatic events that occur in childhood (0-17 years)". (1) A large population-based study suggests half of adults in Wales have experienced at least one ACE. (2) Felitti et al. (1998) created the Adverse Childhood Experience Questionnaire for research quality measurement of 10 ACEs. Broadly they can be split into ACEs abusive in nature and environmental adversity. Felitti and colleagues also demonstrated a significant relationship between ACE exposure and long-term negative health outcomes. (3) ACEs have been separately associated with later psychosis (4) and later violence (5). Violence occurs more commonly among people with psychosis than without. (6) Therefore, questions arise about links between ACEs and a psychosis-violence combination.

The primary research question was: is there evidence from published literature that ACEs are associated with a later combination of psychosis and violence, compared to outcomes of psychosis only, violence only, or neither? Secondary research questions considered the nature, quantity and context of ACEs associated with the psychosis and violence combination, exploring pathway analyses.

Methods

A systematic literature review and meta-analysis was completed. A list of terms was generated, informed by current literature, covering the three broad topics: ACEs, psychosis and violence. Terms were entered into five databases (with required syntax adjustments): Medline, EMBASE, PsycINFO, ASSIA and Web of Science.

Reference lists from included papers were checked. Grey literature was searched in the form of reports from the World Health Organisation, public health documentation and theses. Included papers had research quality methods of ACEs, psychosis and unequivocal violence to others in one of the groups studied. Papers were excluded if relying on measures of hostility or aggression rather than actual violence, or if without evidence that onset of the violence-psychosis combination *post-dated* any ACE. Only papers in English were included. Reliability of selection was confirmed by comparing blinded ratings.

Templates for data extraction were developed and completed for each included paper by three researchers extracting blind to each other. Data from studies with comparable methods were pooled and a summary effect size calculated. Transformed effect sizes, lower and upper confidence intervals and standard errors were entered into Stata Statistical Software and meta-analysis run, using a random effects model to allow for study heterogeneity. A narrative analytic approach was used for secondary research questions.

Ethical approval was not required for this project.

Results

5226 unique papers were identified with 104 papers retained after title and abstract screening. In total, seven studies were eligible for inclusion, three had sufficiently comparable methods for meta-analysis.

Overall, five papers found a significant association between at least one measure of ACE and later violence in the context of psychosis. Two papers did not. Only three papers studied all four comparison groups of interest.

A meta-analysis was only possible to measure the relationship between physical abuse and later outcomes of unequivocal violence to others in the context of psychosis. Studies included in the meta-analysis considered serious violence, including but not limited to homicide. (7-9) It was confirmed that a history of childhood physical abuse in individuals with psychosis increases the likelihood of later serious violence perpetration by three-times (OR 3.09, CI 1.12-8.56).

Two papers included in the meta-analysis found a significant relationship between physical abuse and later violence in the context of psychosis. Although, Kumari et al. actually found that a combination of ACEs was significantly related to later psychosis and violence only in comparison to healthy controls, not groups with psychosis or violence only. (9) However, Engelstad et al. didn't find a significant relationship between physical abuse and later violence among those with psychosis. (8)

Collectively, studies of the relationship between ACEs and later perpetration of actual interpersonal violence in the context of psychosis demonstrate a trend towards a small effect. However, only three studies included all four comparison groups of interest.

The meta-analytic findings of this paper are similar to those of a recent study by Green et al., (10) who found a significant relationship between childhood maltreatment, defined as ACEs of an abusive nature, and later violence among those with psychosis, despite little overlap of included studies. Our study took a more stringent approach to inclusion criteria, focussing on unequivocal violence perpetration during psychosis rather than also including violence prediction.

Future research would be best carried out with contemporaneous measures of ACE exposure and collateral information, with prospective follow-up. A low prevalence of psychosis could be countered by cooperation of multiple research centres. Follow-up over a 10-year window, with comparisons to a control group would allow for sequencing of events and measure of effect. Prospective measure of post-traumatic stress disorder, substance use and subsequent victimisation in adulthood would allow for a more robust measure of pathway analysis that is not yet possible.

Lessons Learnt

Having never completed a systematic review and meta-analysis before, I was unsure of what to expect. Initially I felt overwhelmed by the number of papers generated from the search strategy. I was concerned about balancing screening papers with the rest of my course and assignments. However, meeting with the healthcare librarian and my supervisors allowed me to ensure my search strategy was comprehensive and develop a system to screening the papers. By setting myself smaller goals within achievable time-frames, I was able to effectively manage my time to screen the papers whilst carrying out other important goals. I initially found learning how to conduct a meta-analysis challenging, but the process highlighted the importance of conducting independent research by taking out relevant books from the library and asking for help from those more qualified.

Learning the process of critically appraising papers was made more manageable by using critical appraisal tools recommended by the librarian. Having a structure to critically appraise papers meant that I didn't miss any potential source of bias. This is a skill that will be useful in my future development as doctors have a responsibility to keep up to date with new developments in research, but also consider the quality of such evidence.

References

1. Centers for Disease Control and Prevention. Preventing Adverse Childhood Experiences; 2019 [accessed 10 Jun 2020]. Available from: https://www.cdc.gov/violenceprevention/childabuseandneglect/aces/fastfact.html.

2. Hughes K, Ford K, Davies AR, Homolova L, Bellis MA. Public Health Wales. Welsh Adverse Childhood Experience (ACE) and Resilience Study [accessed 10 Jun 2020]. Available from: https://www.wales.nhs.uk/sitesplus/documents/888/ACE%20&%20Resilience%20Report%20(Eng_final2).pdf.

3. Felitti et al. Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. AJPM. 1998;14:245-58.

4. Varese et al. Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective- and cross-sectional cohort studies. Schizophr Bull. 2012;38:661-71.

5. Hughes et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. Lancet Public Health. 2017;2 [accessed 22 Nov 2020]. Available from: https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(17)30118-4/fulltext

6. Fazel S, Gulati G, Linsell L, Geddes JR, Grann M. Schizophrenia and violence: systematic review and meta-analysis. PLoS Med. 2009;6 [accessed 22 Nov 2020]. Available from: https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000120 doi:10.1371/journal.pmed.1000120

7. Buchanan A, Sint K, Swanson J, Rosenheck R. Correlates of future violence in people being treated for schizophrenia. American Journal of Psychiatry. 2019;176:694-701.

8. Engelstad KN, Rund BR, Lau B, Vaskinn A, Torgalsboen AK. Increased prevalence of psychopathy and childhood trauma in homicide offenders with schizophrenia compared to nonviolent individuals with schizophrenia. Nord J Psychiatry. 2019;73:501-8.

9. Kumari et al. Lower anterior cingulate volume in seriously violent men with antisocial personality disorder or schizophrenia and a history of childhood abuse. Aust N Z J Psychiatry. 2014;48:153-61.

10. Green K, Browne K, Chou S. The Relationship Between Childhood Maltreatment and Violence to Others in Individuals With Psychosis: A Systematic Review and Meta-Analysis. Trauma Violence Abuse. 2019;20:358-73.

The British Student Doctor, 2020;4(3):46-48
doi: 10.18573/bsdj.188
C4ME Supplement

The application of allometric scaling to regulatory toxicology

C4ME SUPPLEMENT

AUTHOR INFORMATION

Shanali Thanthilla
Cardiff University School of Medicine

Dr James Coulson
Cardiff University School of Medicine

Address for Correspondence:

Shanali Thanthilla
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: ThanthillaSH@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 19.11.20

Link to YouTube Video:
https://youtu.be/OMsaqJGv5rc

Background

When chemicals pose a threat to human health, a theoretical safe dose for human exposure must be determined. This is the goal of chemical risk assessment in regulatory toxicology. Initially, animal toxicology studies are evaluated. Animal studies provide a means of predicting human toxicities when insufficient human data is available.

Different regulatory bodies use different approaches for inter-species dose extrapolation. This is where uncertainties arise. In our study, the extrapolation process used by the United States (U.S) Food and Drug Administration (FDA) and the European Food Safety Authority (EFSA) was compared. The FDA uses allometric scaling for chemical dose extrapolation, whilst the EFSA does not use allometric scaling. Therefore, our study investigated the role of allometry in inter-species dose extrapolation.

Allometry can be defined as adjusting data to allow for differences in body size and function between species. (1) The FDA adjusts chemical doses according to the body surface area, in order to account inter-species differences in metabolic rates. (2) However, drawbacks of allometry are also discussed in the literature. We aimed to discover whether the application of allometry to chemicals tested by the EFSA had the potential to affect regulatory decisions and, hence, determine the applicability of allometry to hazard characterization (dose-response relationship) in regulatory toxicology.

Methods

The Committee on Toxicity (CoT) reviews EFSA toxicity data on chemicals in food, consumer products and the environment. (3) Chemical toxicity data was collected from open source CoT records, available at https://cot.food.gov.uk. Ethical approval was not required since the research project was limited to open source data. A total of 560 papers, from February 2008 to January 2020, were assessed in our study.

The No Observed Adverse Effect Level (NOAEL), animal species used, uncertainty factor, exposure assessment values (mean and 97.5th percentile) were noted for each chemical found in the records. Chemicals were not included in our study if there were insufficient information for analysis. Interestingly, some chemicals had multiple exposure assessment values, as multiple age groups were assessed. Therefore, 43 data points (chemicals with corresponding exposure assessment age groups) were gathered in total.

For each data point, doses were calculated with allometry using the FDA's Maximum Recommended Starting Dose (MRSD) approach, and without allometry using the EFSA's Health Based Guidance Value (HBGV) approach. (2,4) Absolute differences were calculated between doses with and without allometry. Absolute differences were then compared against exposure assessment values to assess if the data points were significant. Ratios were calculated between doses with and without allometric scaling to assess the extent of the dose difference. An alpha of <0.05 was used to determine statistical significance of allometry.

Results

Thirty-nine out of 43 data points had absolute differences greater than the mean exposure assessment values. Only 28 out of 43 data points had 97.5th percentile exposure assessment values quoted in CoT records. Of these 28 data points, 20 had absolute differences greater than the 97.5th percentile exposure assessment values. Overall, 20 data points had absolute difference greater than both the mean and 97.5th exposure assessment values. The absolute differences for the 20 data points ranged from $2.364 \star 10^{\wedge -5}$ to 2.097.

Ratios, between doses with and without allometric scaling, ranged from 1.1 to 12.3. All 43 rations are shown on figure 1. The largest dose decrease after allometry was approximately 92%, and was seen in bisphenol A, diethyphthalate, acetyl-deoxynivalenols and deoxynivalenols. A 9% dose decrease after allometry was seen in both zearalenone (in 4 to 12 month olds) and ochratoxin A (all age groups). However, the absolute difference of zearalenone was greater than both the mean and 97.5th exposure assessment values, wheres the absolute difference of ochratoxin A was not.

The 95% confidence interval of proportion between the total number of data points and significant data points (when compared to the mean exposure assessment values) was 0.779- 0.974.

Discussion

From the 95% confidence interval of proportion calculated, It was evident that a majority of chemicals were affected by allometric scaling in our study. As shown by the data points "zearalenone (in 4 to 12 month olds)" and "ochratoxin A (all age groups)", it was also clear that similar dose decreases can lead to different toxicological outcomes. Therefore, the significance of allometry may not be down to the extent of the dose difference, but the chemical and/or age group itself.

Published evidence by Schneider et al., also support the use of allometry in toxicological risk assessment. (5) However, based on our study alone, it is difficult to conclude that allometric scaling alone could affect regulatory decisions. This is because our study contains some limitations and gaps in knowledge. For instance, only 43 data points were included in our study. Therefore, larger and in-depth studies are required to validate our findings. In the future, it may also be worth investigating intrinsic chemical properties, such as lipophilicity, to understand which chemicals are affected by allometry. In addition, physiologically-based toxicokinetic modelling could be utilised to identify the accuracy of allometry in future studies. (6)

It is also important to note that allometry disregards many inter-species variation, such as genetic polymorphisms affecting species' toxicokinetics and toxicodynamics. (7) Therefore, allometry may not be reliable on its own. It may be that allometry should be used in combination with advancements in computational toxicology. This includes mathematically-modelled uncertainty factors or use of toxicogenomic data in animal studies. (8, 9)

Lessons Learnt

Since allometric scaling is a concept dating back to 1930s, many papers had been published. Therefore, it was necessary to systematically evaluate older and recent publications. Formulating questions after reading the literature helped me conduct more focused database searches and keep up with advancements in inter-species dose extrapolation.

This data analysis project also involved evaluating many CoT papers. Hence, effective time management was of upmost importance. Setting myself deadlines every week and making daily "to-do" lists helped me keep up with the workload. Some mistakes were made when recording chemical data on Microsoft Excel, which helped me realise the importance of proof reading with each data entry. Overall, this project challenged my critical thinking and organisational skills.

References

1. Duffus JH, Worth HGJ. Fundamental Toxicology (2nd ed). Cambridge: Royal Society of Chemistry; 2006.

2. Food and Drug Administration Centre for Drug Evaluation and Research (CDER). Guidance for industry: estimating the maximum safe starting dose in initial clinical trials for therapeutics in adult healthy volunteers. United States: FDA; 2005

[accessed 25 Sep 2019]. Available from: https://www.fda.gov/media/72309/download

3. Committee on Toxicity. CoT meetings- agendas, papers and minutes. London: COT; 2020 [accessed 01 Feb 2020]. Available from: https://cot.food.gov.uk/cot-meetings/cotmeets/cotmeets

4. European Food Safety Authority. Update: use of the benchmark dose approach in risk assessment. European Union: EFSA; 2017 [accessed 25 Sep 2019]. Available from: https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2017.4658

5. Schneider K, Oltmanns J, Hassauer M. Allometric principles for interspecies extrapolation in toxicological risk assessment- empirical investigations. Regul Toxicol Pharmacol. 2004;39(3):334-47.

6. Cohen Hubal EA, Wetmore BA, Wambaugh JF, El-Masri H, Sobus JR, Bahadori T. Advancing internal exposure and physiologically-based toxicokinetic modeling for 21st-century risk assessments. J Expo Sci Environ Epidemiol. 2019;29(1):11-20.

7. Sharma V, McNeill JH. To scale or not to scale: the principles of dose extrapolation. Br J Pharmacol. 2009;157(6):907-21.

8. Dankovic DA, Naumann BD, Maier A, Dourson ML, Levy LS. The scientific basis of uncertainty factors used in setting occupational exposure limits. J Occup Environ Hyg. 2015;12:S55-68.

9. Choudhuri S, Patton GW, Chanderbhan RF, Mattia A, Klaassen CD. From classical toxicology to Tox21: some critical conceptual and technological advances in the molecular understanding of the toxic response beginning from the last quarter of the 20th century. Toxicol Sci. 2018;161(1):5-22.

Figures

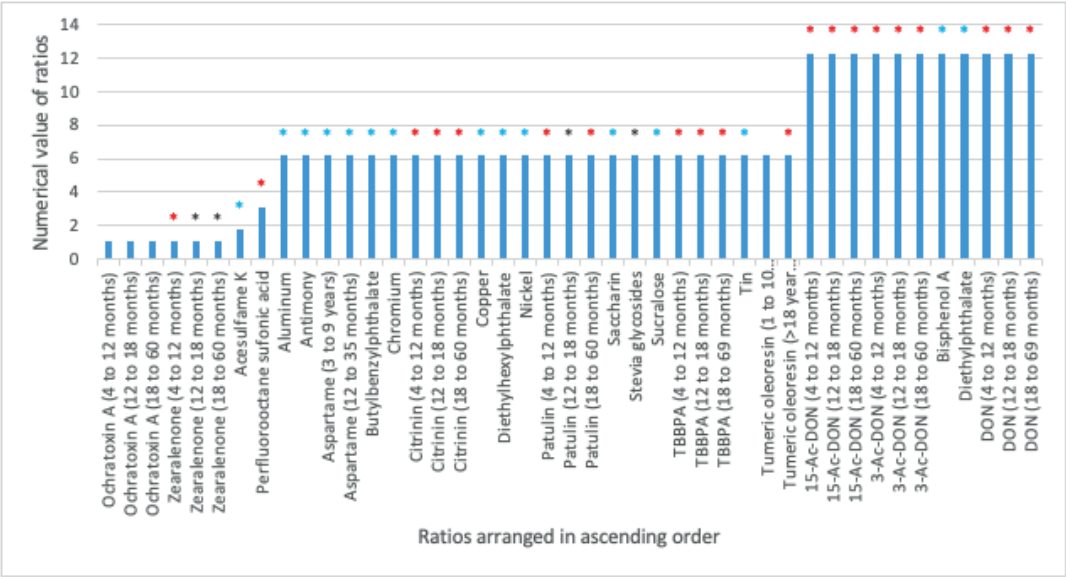


Figure 1: Graph showing the ratios arranged in ascending order. *The ratios for 43 data points range from 1.1 to 12.3. Six data points had ratios of 1.1, one data point had a ratio of 1.8, one data point had a ratio of 3.1, 24 data points had ratios of 6.2, and 11 data points had ratios of 12.3. Data points with absolute differences greater than both the mean and 97.5th percentile exposure assessment values are denoted as *. Data points with absolute differences greater than the mean exposure assessment values, and those with no reported 97.5th percentile exposure assessment values are denoted as *. Data points with absolute differences greater than only the mean exposure assessment values are denoted as *. Data points with absolute differences not greater than both the mean and 97.5th percentile exposure assessment values have no asterisks. DON= Deoxynivalenol; TBBPA= Tetrabromobisphenol A*

The British Student Doctor, 2020;4(3):49-51
doi: 10.18573/bsdj.201
C4ME Supplement

The morphology of musket wounds

C4ME SUPPLEMENT

AUTHOR INFORMATION

Michael Evans
Cardiff University School of Medicine

Professor Stephen Rutherford
Cardiff University School of Biosciences

Address for Correspondence:

Mr Michael Evans
Cardiff University School of Medicine
The Cochrane Building
Heath Park, Cardiff
CF14 4YU
United Kingdom

Email: EvansMJ12@cardiff.ac.uk

No conflicts of interest to declare

Accepted for publication: 31.10.20

Link to YouTube Video:
https://youtu.be/wq-RF-3ZJTA

Background

The study of historical surgery allows for greater understanding of historical medicine and how such techniques differ to modern equivalents. As such, recent academic interest has focused upon the biomedical validity of the surgical techniques used to treat patients in the medieval and early modern periods. (1) The early modern time period is classically defined to encompass 1500-1800 AD. For the purposes of this article, 'modern' refers to the late 19th century onwards. Early modern military surgeons would have had to treat gunshot wounds caused by lead musket balls fired from black powder charged firearms. Substantial advances have been made in ballistics technology since the 16th and 17th centuries, fundamental adaptations to the technology have led to differing ballistics behaviour between modern and historical ammunition. Previous attempts to describe musket wound morphology have used modern projectiles as analogues. (1) Extrapolating data derived from modern projectiles to apply to historical examples is inherently flawed due to such design differences. As such, debate still exists regarding the morphology of musket ball inflicted wounds, and therefore whether the methods adopted by early modern surgeons to treat them would have been effective.

Aims

- Can current data regarding gunshot wounding from modern weapons accurately predict the behaviour of pre-industrial weapons?
- Can data available at the present regarding pre-industrial firearms allow for the accurate prediction of gunshot wound morphology in human beings?
- Can accounts from historical sources describe gunshot wound morphology in enough detail to corroborate our modern understanding?

Methods

A literature search of the medical and non-medical journals available on Scopus, Web of Science and PubMed was conducted to assess the validity of ballistics data at predicting the wound morphology of modern projectiles as well as historical weapons. Facsimiles of published surgical treatises of Ambroise Paré (1510-1590) and Richard Wiseman (1621-1676) were searched for recorded incidences of gunshot wounds and descriptions of their morphology. This project did not require ethical approval.

Results

A total of 234 papers were obtained using a range of keywords, filtered to 131 papers of potential relevance, 30 of which were analysed in detail. These papers used a variety of modalities to assess gunshot wound (GSW) morphology, mainly ballistics gelatine but also animal models as well as post-mortem data were used. Modern ballistics reveals that a model to assess the morphology of gunshot wounding can be divided into 4 categories: permanent wound tract (the path of the bullet), temporary cavitation (damage from the displacement of tissue parallel to the bullet), penetration (the depth of entry of the bullet), and projectile fragmentation (the shattering of the bullet within the body). (2) A review of the modern literature also revealed an over emphasis the role of temporary cavitation (3) in wounding as well as the significance of projectile fragmentation in causing more substantial injuries. (4)

Modern ballistics data for 17th century projectiles suggest that maximal temporary cavitation may occur far more proximal in wound tract compared to modern weapons with a reduced fragmentation rate when fired into soft tissue analogues such as ballistics gelatine. (5) The permanent wound tract may be impacted by projectile deformation, prominent in soft lead musket balls. This is not seen in modern projectiles.

The literature revealed 11 modern autopsy cases where a musket ball had been used in a homicide or suicide as well as 8 ballistics reports involving muskets. In addition, 34 descriptions of bullet wounds were obtained from the historical sources.

Modern forensic cases regarding musket wounds were collated to reveal that 27% of wounds produced an exit wound and 18% resulted in projectile fragmentation in primarily wounds to the head and neck. Due to the limited modern data available for musket wounds outside the head and neck, historical accounts were also scrutinised. These accounts reveal that exit wounds were formed between 26.5%-51% of the time with only 6% of cases resulting in projectile fragmentation in a variety of anatomical locations including the limbs and trunk. This is significant as it reveals that musket balls were unlikely to fragment when fired in soft tissue and more likely to be retained within tissue compared to a modern round. This appears to be congruent with the results of the few ballistics papers available in this field. (4, 5, 6)

Discussion

These results suggest that muskets balls do not necessarily conform to Fackler's classical model of ballistics. Musket balls did not appear to fragment unless striking bone and had a reduced capacity to penetrate through human tissue. Ballistics tests using both soft tissue simulant and anatomically correct models are required to confirm these observations from the literature.

These results are applicable to several fields. Although rare, GSW with black powder weapons do occur in the forensic literature. These data may be used to help the pathologist to characterise such injuries. It also assists medical historians in understanding the effectiveness of 17th century surgery. The low rate of projectile fragmentation would suggest that the doctrine of rapid removal of the embedded ball from the patient was a logical approach to treatment of this type of wound.

Lessons Learnt

Due to the historical nature of this dissertation, the conventional techniques used to gather data for a literature project had to be modified. The search for modern, peer-reviewed journals regarding black powder gunshot wounds was frustrating due to the dearth of such material. However, this in combination with the novel approach to reviewing period appropriate documentation made discoveries particularly satisfying. The primary skill I gained from this project was that of critical analysis. This is only achieved by reading a large volume of scientific literature from various periods. This enables one to identify fallacious arguments that have penetrated the literature without proper merit. This is a vital skill required for any scientist. Secondary skills such as manipulating databases, data processing and scientific writing were also achieved.

It is commonly stated that a good doctor is a good scientist. This project enabled me to apply the scientific method to answer a historical problem thus enabling me to develop this important skill. It must also be considered that playing the historian is critical to the role of a physician when ascertaining information from a patient. Combining these two disciplines, I hope, will improve my capacity to practice medicine in the coming years.

References

1. Rutherford S. A new kind of surgery for a new kind of war: gunshot wounds and their treatment in the British Civil Wars. Oxford: University Press Scholarship Online; 2018. p. 57-77.

2. Fackler ML, Malinowski JA. The wound profile: a visual method for quantifying gunshot wound components. The Journal of Trauma. 1985;25(6):522-9.

3. Fackler ML. Wound ballistics: a review of common misconceptions. The Journal of the American Medical Association. 1988;259(18):2730-6.

4. Fackler ML, Surinchak JS, Malinowski JA, Bowen RE. Bullet fragmentation: a major cause of tissue disruption. The Journal of Trauma. 1984;24(1):35-9.

5. Krenn P, Kalaus P, Hall B. Material culture and military history: Test-firing early modern small arms. Material Culture Review. 1995;42:101-108

6. Dougherty PJ, Eidt HC. Wound ballistics: Minie ball vs. full metal jacketed bullets--a comparison of Civil War and Spanish-American War firearms. Military Medicine. 2009;174(4):403 7.

The British Student Doctor Journal

To discuss an article published in this issue, please contact:

editorinchief@bsdj.org.uk

The British Student Doctor
Cardiff University Press
PO Box 430
1st Floor, 30-36 Newport Road
Cardiff, CF24 0DE
United Kingdom

bsdj.org.uk

/thebsdj

@thebsdj

@thebsdj

To submit an article for publication in **The British Student Doctor**, please visit: bsdj.org.uk/author-guidelines

bsdj.org.uk