The Evidence Base for Education - Medical Students in Obstetrics and Gynaecology

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Abstract

Every person has been through a pregnancy at least once (as a fetus) and many will experience it several times. It is crucial that doctors are aware of the evidence base so to make good decisions and provide accurate advice in pregnancy. This review article summarises the evidence on Medical Education for undergraduate and postgraduate medical students, with many generic points to allow others to apply teaching points to their own specialities.

Keywords: Medical Education, Theory, Obstetrics, Gynaecology

Literature Review

Introduction

Every human being has been exposed to pregnancy at least once. Some have had multiple exposures, either professionally or personally through their family. As a speciality Obstetrics and Gynaecology (O&G) is therefore one where it is crucial that students have a high-quality exposure to evidence based education as well as developing the ability to find this evidence base in the future. The consequences of mistakes can be very high to all concerned.

The aim of this review was to explore the evidence base of how to provide high quality Medical Education in the subject of O&G. As the evidence is heterogeneous – with different clinical systems, different educational programmes, different cultural norms and different populations – it is presented as a series of suggestions for academics, administrators and students. In addition, while this literature review focuses on O&G, these suggestions are generic to nearly every other clinical subject.

Plan to succeed: Pre-Learning Material
Specific adjustments to the medical education curriculum have been identified to enhance student learning and improve student perception of O&G. One such adjustment includes the addition of pre-learning material made available to students prior to their rotation in O&G. Improving student confidence through provision of pre-learning material to ease the transition from pre-clinical theory to clinical learning may be necessary to improve student experience and enhance acquisition of knowledge and skills on the labour ward (Johnson 2012; Amorosa 2012). Students often feel frustrated with unclear learning objectives and have identified pre-learning material with pre-specified learning aims as important (Cotter, 2016). Students have noted the need for a ‘refresher’ course on the focused skill-set required for the O&G rotation, as well as clearer links between theory and clinical practice (Johnson, 2012). One method to enhancing medical student learning in a clinical environment involves instructing students on the ‘micro-skills of clinical learning’, which increases students' engagement in their learning. Such micro-skills can include setting goals for educational encounters, providing evidence, asking for feedback and correcting mistakes. After a one-hour interactive session on the micro-skills students felt more at ease in asking their tutors for feedback, setting goals for patient encounters and making clinical decisions (Amarosa, 2012).

Studies suggest pre-learning would not only aid students in their confidence and adjustment to clinical practice, but also improve faculty confidence in students, allowing for more personal interaction with patients, thus improving student learning experience (Johnson, 2012; Baecher-Lind 2015). Pre-learning material may assist in clarifying what is expected of students by faculty and introduce students to the complex culture of the labour ward (Johnson, 2012). Strategies to incorporate pre-learning into the medical curriculum include nurse-shadowing programmes, as well as the implementation of an Education Chief Resident to act as a medical student liaison and assist in orienting students to the O&G rotation (Baecher-Lind, 2015). However, the implementation of pre-learning material requires effective curriculum management to ensure that students can bridge the gap between theory and practice with ease and confidence (Johnson, 2012).

Everyone Needs to Know Their Role

Ensuring students are aware of their role, as well as the role of their team members, can improve student confidence. Given the multidisciplinary nature of the O&G specialty, it is vital that students have a good understanding of the roles and responsibilities of each team member in the operating room, clinic or labour ward. Ambiguity in student and teacher roles may place a strain on student learning (Brunstad, 2014). On the labour ward, for example, medical students and their midwifery student colleagues state large discrepancies in their perceived roles and responsibilities on the labour ward (Quinlivan, 2002). Some midwifery students did not feel that medical students had a role in activities of labour and delivery (Quinlivan, 2002). Similarly, discordance existed between what midwives’ expected of the medical students’ and what the medical students’ perceived as their role on the labour ward (Quinlivan, 2003). Midwives and medical students demonstrated significant differences between their expectations of medical student involvement in facilitating a delivery, performing a well-baby check and providing advice on breastfeeding (Quinlivan, 2003). A recent study reported that students felt as though they missed out on valuable learning opportunities because they were unclear of their role (Cotter, 2016).

It has been shown that student expectations correlate strongly with their actual experiences, and strong negative anticipation may colour actual experience (Baecher-Lind, 2015). Some students have negative perceptions of the O&G rotation based on knowledge acquired from their peers who report mistreatment and lack of engagement throughout the O&G rotation. The students reported that they felt as though the staff prevented their involvement in patient-care to protect the patients, whereas the patients themselves were happy to have medical students as part of their care. Addressing each others’ roles and responsibilities for the students and the educators will prevent this form of miscommunication. The increased awareness of each team members’ role may assist in developing a
positive teacher-learner relationship and assist in increasing medical student confidence on the labour ward (Baecher-Lind, 2015).

**Use Technology**

Studies have shown that interactive computer-based learning may be more effective than conventional book learning, specifically when studying complexities such as pelvic anatomy (Corton, 2006). Pre-clinical anatomy may be forgotten by the time students commence the O&G rotation, which is worrisome as pelvic anatomy is an integral part of O&G training. Additionally, computer-based tutorials cut down on the costs of cadavers and accommodates student and staff time constraints (Corton, 2006). Computer-based information sharing may be the way of the future in O&G training, as demonstrated by the pilot of the Wiki technology currently being implemented by the Institute of Obstetrics and Gynaecology (IOG) in Ireland (McVey, 2013). This purpose of this platform is to upload, edit and share information regarding different IOG training sites in Ireland, with the rationale that trainees should have the "right knowledge and the right skills at the right time", in order to assimilate into new training facilities quickly and easily. Technology allows material to be broadly accessed by students, and may be implemented in the O&G rotation in the form of pre-learning material such as an online tutorial on the normal stages of labour, or an interactive model of pelvic anatomy. Using the Wiki technology could allow students to share information among their peers regarding team member roles and learning aims and expectations at each training site, and could potentially reduce students' negative expectations or fears prior to commencing the O&G rotation.

**Have Clear Aims**

The Association of Professors of Gynaecology and Obstetrics (APGO) created Medical Student Educational Objectives used by United States and Canadian medical schools as a 'blueprint for design and content of the clerkship curriculum (Hammond, 2005). These guidelines are accurately represented on licensing exams and portray the essential skills required to be a competent O&G physician. Similarly, the Royal College of Obstetricians & Gynaecologists (RCOG) in the UK provides students with clear guidelines of knowledge criteria, clinical competency and professional skills and attitude for the OB/GYN clerkship (RCOG, 2011). These guidelines are based on expert opinion of what is considered the "core competencies" of any doctor with regards to women's health, and includes practical skills such as examination of the pregnant abdomen and pelvic examination/smear examination. Individual universities may have specific generic competencies that may be addressed partially in the O&G curriculum (e.g. communication, breaking bad news).

**Make the Aims Clear to Students**

While the aims may be clear to academics and administrators, they may not be clear to students. One method to improve the clarity of medical education in O&G is to implement a workbook with learning objectives. A study conducted in New Zealand examined the effects of implementing a tutorial series including a coinciding workbook during the final preclinical year. The workbook contained required pre-reading material, detailed objectives, and outlines for each tutorial session (Paterson, 2012). Students expressed that the interactive log workbook held them accountable for their learning and clearly demonstrated what was expected of them. This intervention increased student interest in the O&G specialty in New Zealand. This study assessed one level of assessment of the Kirkpatrick model (13) (participant opinion); we were unable to identify any other studies in O&G assessing other Kirkpatrick levels.

**Make the Aims Clear to ALL Staff**
Objectives allow for standardization of the curriculum, and defines both the teachers’ and students’ role in the educational process. Educators take on the expected role of providing formal teaching to meet their requirements set by their institution. As part of the multidisciplinary team, nurses, midwives and other members of the labour ward team abundantly provide informal teaching to medical students that is often left unrecognized and underappreciated (Gilmour, 2014). These professionals are not financially compensated for their contributions or acknowledged for their role in teaching medical students, yet their work is appreciated by the students and a very necessary part of their education. Common teaching topics provided by the nurses and midwives include documentation and implementing unit procedures, medication charting, and proper medication selection. If little recognition of informal teaching continues, these tasks may be inadvertently left out, as it is not a requirement for nurses and midwives to teach them specifically.

Formal training for midwives with regards to preceptorship and adult education could be implemented to remedy this issue, as well as incentivizing midwives who have an interest in teaching through provision of a wider array of opportunities within this realm (Gilmour, 2014).

If educator objectives are not clearly stated and the assumption of unofficial teaching on the wards continues, a potential for gaps in student knowledge exists. Uniform teaching should be sought after to avoid this potential difference in student experience. To enhance educator objectives, students believe better feedback from faculty, as well as more structured and direct faculty contact would help clarify clerkship expectations and overall improve their clinical experience on the labour ward (De, 2004). Though this particular study was carried out within the department of surgery, parallels exist due to similarities in teaching from various team members of a group, either at different stages of training, or with slightly different training entirely as in the case of nurses and midwives. More direct contact with faculty might eliminate discrepancy in teaching caused by the different perceptions of medical student education amongst nurses and midwives, or surgical residents. Disagreement concerning roles and expectations stemmed from faculty understanding that residents were better teachers than either the residents themselves or the students evaluated them to be. Students felt residents were the primary source of education in patient care. While education from other members of the team is certainly not wrong, and definitely valued, consistency could be maintained by this scheduled direct contact with faculty members.

*Prepare for the Labour Ward*

Not all programmes offer labour ward exposure for medical students. This lack of clinical exposure to the labour ward may hinder students’ full potential. One study suggests both students and faculty might feel more confident if students are allowed time to acquaint themselves with the environment and refrain from having contact with patients on the first day on the labour ward. During this first day students would have a workshop of the skills required for the clerkship. Using mannequins and extra equipment from the wards to facilitate a problem-based learning experience, students would learn how to examine an antenatal patient, interpret a cardio-tocograph, and several other scenarios they would face on the wards (Johnson, 2012).

Another potential solution to combating the "shock of practice" or the transition between pre-clinical theory and clinical practice into a busy specialty like O&G is to introduce pre-clerkship clinical training session. An Australian study revealed that both students and clinical supervisors agree that adequate clinical preparation before placement would enhance acquisition of knowledge and skills. The skills identified as lacking during placement included pregnant women physical examinations, interpretation of cardiotocography, use of vaginal speculums, conversation with patients and families, and hospital culture (Johnson, 2012).

One mechanism by which to do this would be to offer "Micro-skills of the specialty” composed of both video and lecture prior to clerkship. This intervention has been shown to encourage active learning and facilitate a common...
language between educator and student. "Micro-skills of the specialty" consists of a "Micro-skills of learning" seminar taught to students in conjunction with an educator seminar on "Micro-skills of teaching". These seminars may provide additional next-step modifications in medical curriculum on the labour wards to improve understanding of expectations between educator and student (Amorosa, 2012).

Likewise, simulation training has been used in other cases with similar results. In a randomized control trial of medical students receiving simulation training for a vaginal delivery, the group who received simulation training in addition to a lecture reported higher self-assessed confidence compared to their peers who received the lecture only. Not only did these students feel confident in their clinical abilities, but they also performed significantly higher on their oral and written examination compared to the lecture only students (Holmstrom, 2011). One study revealed that faculty tried to 'protect' patients from students, and defending that they would feel more confident in students' abilities if they were required to do some simulation training prior to working on the labour wards with real patients (Baecher-Lind, 2015). Therefore, simulation training may represent the next-step in modifying medical curriculum on the labour wards to enhance both student confidence, and doctor's confidence in students.

**Respect is a two way street**

Building positive relationships with clinical instructors is also integral in medical education. Building these relationships increases confidence, and students reported a strain on their learning when this relationship failed to develop (Brunstad, 2014). One aspect that may hinder the development of these relationships is the protective behaviour of clinical staff preventing student involvement in patient care. These behaviours were shown to be detrimental to student learning, creating a passive learning experience and an unwelcoming environment. Formal introductions between staff and students prior to the clerkship, holding staff accountable by implementing semi-annual report cards on student treatment and satisfaction with their learning experience, appointing the chief resident as a medical student liaison, and student-nurse pairings to acquaint students with the basics before patient contact are all small interventions which could be implemented to achieve a better team atmosphere (Baecher-Lind, 2015). However, students must also remember that it is their responsibility to return the respect and professionalism to the educators if they wish to build relationships with the team members. Midwifery students found that the key to success on the wards was to implement strategies of controlling their vulnerability and taking the initiative on the wards, cultivating trust with the doctors, midwives and nurses, and to obtain acceptance of their role and how they can adapt to be a part of the team (Brunstad, 2014). Overall, advocacy toward including students in the healthcare team should be improved, as functioning as a team is integral in successful healthcare provision.

**Career Preferences May be Based Speciality Exposure**

Over the past decade there has been a reported decrease in the number of medical students choosing a career in O&G (Hammoud, 2006; Truner, 2006). A recent study of final year medical students across four medical schools in Ireland indicated that only 4% indicated an interest in O&G (Boyle, 2013). If students make career decisions based on clerkship exposure, it can be postulated that students' perception of the O&G clerkship may be integral in their career decision. Students indicated that quality and duration of training impacts their career choice, demonstrating that if these factors are improved, student interest in O&G may be stimulated (Boyle, 2013).

However, other factors seem to be at play as well. One study found that the strongest predictor of post-clerkship interest in O&G was pre-clerkship interest. Female interest increased slightly post O&G rotation while male interest was unaffected. However, despite this slight increase in female interest post-clerkship, a smaller percentage ultimately choose to enter the field. Students reported that negative lifestyle factors and the presence of a mentor are the two most important factors in their career decision. Interestingly, litigation was not (Hammoud, 2006).
The overall decrease in medical students choosing O&G for a career path is clearly multifactorial; faculty accessibility, learning history-taking skills, and student's perception of disrespect were all cited as reasons for poor perception of clerkship experience. Students reported less student-faculty interactions when compared to their surgical and medicine clerkships, which correlated to the minimal constructive and timely feedback in regards to their performance during the clerkship. However when students received faculty instruction they found expectations varied between each physician, creating confusion, uncertainty, and the feeling of being treated disrespectfully for perceived incompetence (Burke, 2004). Additionally, there was a clear lack of interest from male students in the specialty. It was suggested to be a result of male perceptions created about the specialty prior to medical school. Men were less likely to sway their interest in the specialty after their clinical experience when compared to the number of woman with peaked interests in the specialty post clerkship (Hammoud, 2006; Truner, 2006). Male students reported being rejected by more patients than their female colleagues when asking to perform internal exams, and felt that their gender negatively influenced their learning (Zahid, 2015). With the current female predominance in O&G the effect of role models on attracting student interest may dissuade male students. Suggestions made to improve male interest included efforts to stimulate interest pre-clerkship and recruitment could begin as early as matriculation to medical school (Hammoud, 2016).

**Conclusion**

Obstetrics and Gynaecology requires a different broader scope of skills when compared to general medicine, and therefore students have expressed a lack of confidence when they enter the foreign world of the labour ward. Moving forward in today's world of technology, it is suggested that online tutorials and clinical scenario simulations can improve student confidence prior to embarking on their rotation in a new hospital environment.

It is vital to strive to improve student confidence to propel student interest in the field. This encompasses improved pre-clerkship learning, possibly in the form of a guideline book, to ease the transition from classroom to labour ward. One aspect of this should be team-member roles, including a refresher for the educators in their role of including the students as a functioning member of the team. The goal of this is to improve the confidence the team has in the students, which can ultimately enhance the students’ confidence, and thus their experience on the labour ward.

Another deficit to be faced is the differences of expectations between the educator and student. Along with the team member roles, micro-skill seminars for the two cohorts involving learning and teaching goals of each team member can enhance the understanding of what needs to be accomplished on the O&G rotation. This can help build a positive relationship between the educators and students, again, enhancing student confidence and ultimately interest in the speciality.

**Take Home Messages**

Obstetrics and Gynaecology requires a different broader scope of skills when compared to general medicine

Students have expressed a lack of confidence when they enter the foreign world of the labour ward.

Online tutorials, clinical scenario simulations and micro-skill seminars can improve student confidence prior to embarking on their rotation in a new hospital environment.
These can help build a positive relationship between the educators and students, and enhance student confidence and ultimately interest in the speciality.

Notes On Contributors

Shannon Peters, Molly Nemunaitis and Laura Muller are medical students in University College Dublin (UCD). This review is the first part of a voluntary research project that the three students became involved in after completing an elective in Obstetrics and Gynaecology. The research project involves reviewing the evidence (this literature review paper), assessing student feedback to a new educational initiative (within the educational theory of "Community of Learning") and then producing guidance to other medical students on Medical Education Research projects. The three students have completed this research project under the supervision of Mary Higgins (Consultant Obstetrician and academic in UCD) and while also completing their mandatory study modules, electives and while studying for the United States Medical Licensing Examinations.

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Appendices

Declarations

The author has declared that there are no conflicts of interest.

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