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London calling Gaza: The role of international collaborations in the globalisation of postgraduate burn care education

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Abstract

Burn injuries represent a significant epidemiological problem, with the vast majority occurring in low- to middle-income countries. These regions also represent areas where lack of socioeconomic growth and geopolitical instability pose additional barriers not only to healthcare provision but also to the acquisition of continuing professional development. Long-distance, web-based learning programmes ('tele-education') have been identified as a successful and powerful means of propagating up-to-date medical education and training in poor-resource, isolated or conflict-ridden regions.

This report evaluates the role of tele-education in delivering a distance-learning Master's degree in Burn Care to a group of 11 healthcare professionals working in the occupied Palestinian territories (OPT), which was funded as part of a collaboration between Queen Mary University of London and IMET-Pal (International Medical Education Trust – Palestine).

We present our experience in delivering the programme in a conflict-ridden part of the world, which includes the specific adaptations to tailor the programme to regional needs as well the unique challenges faced by students and faculty in enhancing the educational value of this unique initiative.

The academic achievements of this group of healthcare professionals were found to be comparable to historical student cohorts from privileged socioeconomic backgrounds and the majority of students felt that participation in the programme contributed to a direct improvement to their daily burn care practices.

The successful outcomes achieved by our students support the constantly emerging evidence that targeted, well-delivered, long-distance learning programmes can become powerful tools in combating inequalities in global healthcare and health education.

Keywords
Burn education, telemedicine, tele-education, postgraduate medical education, continuing medical education, e-learning

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Lay Summary

Burn injuries represent a major epidemiological problem, with most occurring in low- to middle-income countries. In addition, the lack of socioeconomic growth and political instability in some of these regions can pose additional barriers to healthcare provision and to having access continuing professional development. Long-distance, web-based learning programmes ('tele-education') have been identified as a powerful means of providing up-to-date medical education in poor-resource, isolated regions or areas of conflict.

This report evaluates the role of tele-education in delivering a distance-learning Master's degree in Burn Care to a group of 11 healthcare professionals working in the occupied Palestinian territories (OPT), which was funded as part of a collaboration between Queen Mary University of London and IMET-Pal (International Medical Education Trust – Palestine).

We present our experience in delivering the programme to these students and the adjustments that were made to tailor the programme to these unique circumstances. We also discuss the challenges faced by students and faculty under these difficult circumstances.

The academic achievements of this group of healthcare professionals were found to be similar to previous student cohorts from privileged backgrounds and the majority of students felt that participation in the programme contributed to a direct improvement to their daily burn care practices.

The successful outcomes achieved by our students support the evidence that well-delivered, long-distance, learning programmes can become powerful tools in dealing with inequalities in global healthcare and health education.

Introduction

Burn injuries comprise a significant worldwide epidemiological problem, which has been described by the World Health Organization (WHO) as the 'forgotten global public health crisis'.[1] The vast majority of burns occur in low- to middle-income countries, where standards of care are lagging behind in comparison to high-income nations.[2,3] These observations contribute to an unfortunate paradox within burn care, whereby those areas around the globe with the highest incidence of burns are unable to meet treatment demands because of these socioeconomic limitations.

This global inequality with regards to the delivery of burn care is also impacting upon continuing professional development (CPD), since the acquisition of up-to-date medical education suffers gravely in areas characterised by political instability, poor financial resources and social deprivation. This is due to a culmination of multiple factors including poor access to established teaching centres and universities, paucity of Internet resources and financial barriers which prevent the development of educational programmes.[4,5] This phenomenon is even more amplified in areas of active conflict where, in addition to these limitations, healthcare professionals are faced with an increased workload, often above and beyond what they have been competently trained to do, as well as the sheer need to maintain personal and patient safety in perilous surroundings.[6]

Long-distance, web-based educational programmes, otherwise known as 'tele-education', have the potential to provide a means of surpassing the limitations faced by medical personnel in rural, conflict-ridden or poor-resource areas, by bridging geographical isolation and allowing the free-exchange of information, training and education across borders.[4,5] Tele-education has enabled previously isolated healthcare professionals to embark on CPD, which is central to their ability to provide good clinical care.[7,8]

In this report, we describe our experience as an academic institution in establishing a unique charity-funded postgraduate educational initiative. We present the achievements and challenges faced by a group of Palestinian students who partook in the postgraduate degree programmes in Burn Care offered by Queen Mary, University of London (QMUL) and evaluate the role of web-based, distance learning in delivering specialised burn care education to healthcare professionals in austere and isolated environments.

Health education initiatives in Palestinian territories

Ongoing conflicts in Gaza and the West Bank have meant that the demands on local healthcare professionals have been ever-increasing,

Table 1. Queen Mary University of London Burn Care MSc Course content.

Year 1 MSc (60 credits)		
Module 1		Skin Structure and Function/Burn Pathophysiology
Module 2		Medicolegal Practice /Psychology/Psychiatry
Module 3		Fluid Resuscitation/Smoke Inhalation/Critical Care
Module 4		Anaesthesia/Pain and Pruritus/Dressings and Skin Substitutes
Year 2 MSc (60 credits)		
Module 5		Acute Burn Wound Care/Acute Surgery
Module 6		Fundamentals of Burn Reconstruction
Module 7		Burn Rehabilitation/Scar Management/Multidisciplinary team
Module 8		Research and Ethics
Year 2 MSc (60 Credits) 15,000-word dissertation		

requiring doctors and nurses alike to rapidly expand their skill-set, despite poor resources. However, the ability to keep abreast of medical education and training to support these growing demands has been limited.

The Lancet-Palestinian Health Alliance was established to tackle healthcare-specific problems faced in the occupied Palestinian territories (OPT) through ongoing successful collaborations between the WHO, the United Nations, and esteemed scientists from Palestine and the international scene. A large part of this initiative has been centred around the provision of continuing medical education (CME).[9,10] Additionally, charity organisations such as IMET2000-Pal (International Medical Education Trust - Palestine) and medical education partnerships such as OxPal Medlink have been integral in establishing successful long-distance teaching programmes to enable the delivery of essential pedagogic resources to Palestinian healthcare professionals through the use of 'tele-education'. This method of teaching delivery has been deemed the ideal means of addressing and overcoming the challenging limitations faced by medical staff in isolated regions, enabling the provision of up-to-date education and ongoing professional development.[4]

QMUL Postgraduate distance-learning degree in Burn Care

The web-based, part-time, postgraduate degree programme in Burn Care was first launched by Queen Mary University of London (QMUL) in 2008 with the onus of delivering up-to-date, evidence-based education to healthcare professionals involved in burn care, with an emphasis on a multidisciplinary team approach. The course comprises eight modules spanning the full gamut of burn care, ranging from pathophysiology, wound management, reconstructive options, rehabilitation as well as ethico-legal complexities (Table 1).

Since its inception, the course has attracted students from all over the globe, including Europe, the Middle East, West Indies, Africa and Australia. The teaching material is delivered via the QMUL online learning platform (QMPlus), which is used for accessing reading resources, video tutorials (through Skype® and Adobe Connect®) and online assessments. An esteemed international faculty from a range of disciplines related to burn care act as course content contributors and deliver regular live video-conferencing sessions to enhance the interactive element of the course.

Additionally, our students are granted access to a wide range of international peer-reviewed journals through their university affiliation, enabling access to the latest developments in the field of burn care and medicine overall. Furthermore, the presence of the 'Student Café', a virtual community on our web platform, enables direct, informal discussions between students in the form of an open online forum. This allows bridges of communication to be built between students from all over the globe, bringing together healthcare professionals of varying

experiences and from a wide range of socioeconomic backgrounds.

Assessments range from multiple choice questions (MCQs) to short evidence-based essays pertaining to each specific module and students also partake in an end-of-year Objective Structured Clinical Examination (OSCE)-style examination, which assesses their knowledge and understanding during an on-site, face-to-face and time-restricted examination. Students completing the MSc are also required to submit a 15,000-word dissertation on a burns-related topic of their choice under the guidance of the course convenors. Furthermore, in order to allow a degree of contact between students and tutors, all our long-distance programmes include two clinical days per academic year, which students are encouraged to attend. These allow for an interactive, personal teaching experience to further augment the online content.

Adaptations for the Palestinian student cohort

Through an educational collaborative that was set up between the university and IMET2000-Pal, in 2010 the course opened its doors to a cohort of 11 healthcare professionals (seven doctors and four nurses) based in the OPT. The purpose of this programme was to enable participants to acquire a thorough and up-to-date education on all aspects of burn care to support their ongoing work in Gaza and the West Bank. Having come from a professional background of General Surgery, Orthopaedics or General Nursing, the majority of our students had never been formally trained in the provision of care to burns patients, despite these challenging injuries forming a large proportion of their daily practice. As this is a fee-paying postgraduate course, all students received funding and sponsorship for the entire duration of their studies through IMET2000-Pal.

Initial interview

Through the extensive use of web-based teaching and teleconferencing, our course faculty identified the students' educational needs based on gaps in their training or the requirements of their current professional roles in an active combat zone with limited resources. Specifically, one of our academic clinical lecturers who is fully fluent in Arabic conducted introductory interviews in order to establish the specific teaching and training requirements of the student cohort. Additionally, the students partook in a self-assessment questionnaire to highlight their baseline educational needs and deficiencies. This underpins a key feature of all successful adult teaching programmes which advocate incorporating the specific needs of the student group in order to deliver targeted and resource-relevant teaching.[7,11–13]

At the end of the first cohort's first academic year, the students were asked to anonymously complete a further questionnaire to evaluate their progress and the educational validity of the tutorials and learning materials to date.

Online tutorials and platforms

Aside from receiving teaching on core clinical knowledge pertaining to burn care as per the course's standard set-up, through weekly teleconferencing video tutorials, students would be globally educated on topics such as clinical reasoning skills, critical appraisal, research methodology and evidence-based medicine. These skills were deemed essential in the students' ability to complete their written summative assessments and their dissertation write-ups. Students also had access to the Student Café discussion forum, which allowed for queries and discussion points relating to the course content to be addressed either by fellow students or by the course convenors or teaching fellows who all have access to the platform.

Assessments and language limitations

In the first instance, the University was able to make special concessions in terms of English language proficiency as it was felt that, in view of the great humanitarian mission these students would be providing, the minimum language requirements could be adjusted within reason. Consequently, course tutors could allow a certain degree of leeway with regards to grammatical context or expressive integrity when writing in the English language. Additionally, the course faculty endeavoured to provide detailed, constructive feedback to enhance the educational value of the interaction

Deadline breaches often had to be accepted as students often faced great difficulties in establishing reliable Internet connections under the circumstances and they were encouraged through the process to catch up with their work in a timely manner. Furthermore, students were often given the opportunity to re-submit their

assignments in acknowledgement of the difficulties faced.

Clinical days

In terms of our bi-annual 'clinical days', special considerations had to be taken into account to overcome the travel restrictions faced by the student cohort, which would have precluded them from attending sessions held within the UK. Similarly, due to an escalation of tensions in the West Bank region in August 2013 and the commencement of Israeli and Palestinian negotiation talks, it was not deemed safe for the faculty to travel to the OPT for the clinical days. Therefore, the course faculty successfully organised a two-day clinical workshop in Egypt, enabling the delivery of face-to-face, live lectures, as well as practice sessions for the upcoming final examinations.

End of course examination

Final year students undertook an OSCE-style examination that assessed their knowledge and understanding of topics covered during the programme. Again, this was performed via Skype® teleconferencing to overcome the barriers posed by restriction of movement within and out of conflict zones. The examinations were held in local hospital facilities in Gaza following a special arrangement with the Human Resources department at Shifa University Hospital and were invigilated with representatives from MAP (Medical Aid for Palestinians) and personnel from the WHO. The arrangement involved a series of rooms, one serving as a waiting area and the other with video-conferencing facilities where the students were assessed. The examination content and scoring system was the same as that being used during the face-to-face exams held at the Centre for Cutaneous Research of the Queen Mary University in London but owing to language barriers and poor Internet connectivity the examining faculty offered greater leniency in terms of timing.

Results

During the first year of the programme, a total of 36 tele-seminars were carried out and 1703 e-learning sessions were logged on the course platform. Ten of the video-conferencing sessions pertained to academic practice, four to evidence-based medicine, eleven were based on critical appraisal, four on academic writing and two on developing presentation skills. Four sessions took the form of a 'Journal Club', during which critical evaluation of specific papers from the relevant literature was undertaken under the guidance of a senior member of the faculty.

The average session time for the teleconference teaching seminars was 80 min (SD 12) and the average length of time spend by student on the platform after logging on was 17 min (SD6).

The results of a survey using a 5-point Likert scale undertaken by the students at the end of their first year showed that there was widespread consensus that the course enabled them to be inquisitive and critically appraise information in a manner pertinent to daily patient care. Seven students felt the programme's educational effect led to a direct improvement in the care of burns patients. There was a marked improvement between the pre- and post-course familiarity with critical appraisal and evidenced based medicine and this was statistically significant ($P = 0.002$).

The biggest challenges identified by the students was their inability to participate in clinical days (n = 8), the need for more/longer sessions (n = 6), experiencing power cuts (n = 6), the feedback they were given, inadequate tele-education facilities (n = 5) and difficulty accessing the e-library/journals (n = 3). The most useful aspect of their learning experience, as highlighted by the students, were the live interactive sessions with focus on critical thinking, the course content and the greater understanding of critical appraisal and evidence-based medicine.

The students wrote a total of 242 assignments with an average assessment mark of 67.4 ± 5.4%. To date, all students have completed their studies, with two having been awarded a distinction, two a merit and the rest achieving a pass. These in-course assessments as well as end-of-course examination results are comparable to historical student cohorts from privileged socioeconomic backgrounds.

Discussion

It is well-recognised that the quality and accessibility of medical education is fraught with challenges in isolated and tumultuous regions.[4] In an almost unfortunate antithesis, those areas with increased healthcare demands and increased need for access to current medical education (e.g. presence of widespread disease or high trauma case-loads) are the same areas where the acquisition of this education is most limited. This is due to lack of resources, geographical isolation, poor infrastructure, movement restrictions,

few medical schools, and the unavailability of trainers and faculty owing to the ongoing phenomenon of medical migration.[14–19] These factors make it extremely challenging for healthcare professionals to keep abreast of developments in their practice as the means of maintaining continued professional development are non-existent.[7,8]

The UK has long expressed a commitment to improve healthcare and establish educational collaborations with low-resource, developing countries. This was formally outlined in the 2007 Department of Health Global Health Partnerships reports.[16] The establishment of collaborative learning and educational partnerships underpins the ability to improve global health on a wide scale by enabling the propagation of knowledge in even the most isolated and underdeveloped territories.[6]

Tele-education and web-based learning, which encompass the use of information and communication technologies (ICTs) for the purpose of enabling long-distance education, have been well-established means of bypassing the educational challenges faced by healthcare professionals in isolated, rural regions and the last few years have seen successful examples of using online, audio or teleconferencing in delivering CME throughout the globe.([4,5,8,17,20,21] The increasing advancements in informatics have meant that the use of the Internet and long-distance learning are becoming more widely available, reliable and increasingly acceptable as credible educational tools.[22–24]

A remarkable effort by a group based in King's College London allowed the delivery of live Internet-based teaching to medical students and interns in Somaliland and Sierra Leone, through an online teaching platform (MedicineAfrica.com).[14,25] A similar successful collaborative has been demonstrated by the OxPal Medlink long-distance learning programme, whereby UK-based clinicians deliver case-based teaching to senior medical students in the West Bank.[6] These models, as demonstrated by the RAFT ('Réseau en Afrique Francophone pour la Télémédecine') e-health initiative established by Swiss doctors to deliver health education in French-speaking African regions, enable large student groups to be educated without a comparable need for large numbers of tutors or educators, and provide a cost-effective virtual 'bedside' teaching model.[5,14]

The ethos of such educational programmes is based on the same principles as those of well-established tele-medicine initiatives involving poor-resource countries which revolve around the propagation of education and the sharing of resources and expertise.[19,22,26–29] Shared educational resources and a commonality of medical language and treatment will also further support the inevitable globalisation of healthcare.[18]

The success of the aforementioned initiatives and the educational model we were able to establish with our Palestinian Burn Care students is testament to the fact that targeted international collaborations can have a massive impact in delivering high-quality education in isolated, low-income or challenging environments, having a far-reaching effect on those healthcare professionals treating a high volume of patients within low-resource settings.[14]

A key feature in making these long-distance teaching programmes effective and relevant is tapering these to the educational needs of the students in relation to their own environment, resources and capabilities: recounting the successes of state-of the art burns centres within the UK would be obsolete in trying to educate healthcare professionals who barely have access to the most basic equipment and it is paramount to uphold and respect local practices and social beliefs.[5,15] For this reason, we felt that teaching that was based on the fundamental principles of burn care, which could then be globally applicable, in addition to enabling access to expert knowledge and literature was a far more powerful tool in the armoury of delivering effective burn care education to these students. This encompasses most the nature of the teaching methodology we strove to implement. The OxPal team have attempted to maintain clinical relevance from the students' perspective by basing their tutorial content on those cases experienced in local wards and hospitals.[6] Similarly, we aimed to identify our students' specific educational needs early through the use of self-assessment questionnaires and targeted web-based discussions. We were appreciative of the fact that some of the topics covered in the course such as the use of skin substitutes or advanced scar therapies may not be necessarily applicable or relevant in the context of our students' practice but inclusion of these topics as an educational tool and resource meant that all aspects of burn care were covered as part of the course. Therefore, although the content of the modules was not altered, the focus of the online tutorial topics was based on the specific cases encountered by the students and, similarly, concessions were made for the subject matter of the written assessments to reflect the students' case-loads, clinical exposures and working environments.

These educational partnerships are also a means for healthcare professionals in isolated regions to obtain valuable information regarding training and resources available abroad.[14] On several occasions our students have enquired about the nature of training within the UK so as to build upon their knowledge and expertise and we have been able to give them current, realistic advice and guidance on how to further pursue this. This collaboration has also acted as a platform for clinical 'observership' programmes for some of our students who were able to pursue visiting fellowships in world-renowned, UK-based burn centres, facilitated by the course faculty.

The ability for students to pace their learning is a key-feature of long-distance, part-time learning programmes and is recognised as positively influencing student interaction and course outcomes.[12,20,23] As a result of this, long-distance learning offers an element of flexibility which can be very beneficial for busy, postgraduate students in full-time work.[30,31] This feature was especially important in our student population who, owing to the heavy workload and difficult circumstances they were facing, allowing the ability to pace their learning and coursework at a rate that was contusive to their ongoing work and also factored in issues such as computer access and Internet connectivity. The majority of our students completed their studies over three years rather than the two years set out by the initial curriculum. This understandably reflected the idiosyncratic difficulties faced by students when undertaking a degree programme in a non-native language while also facing the remarkable challenges of ongoing conflicts in their local vicinity.

The challenges of tele-education

Our teaching programme highlighted some of the expected difficulties encountered in long-distance learning programmes and these issues were further augmented by the fact that our students were based in war-zones or rural communities: poor access to technology (Internet connectivity, computer unavailability); stringent firewall barriers; computer illiteracy; lack of appropriate facilities; electrical disturbance; time-zone incompatibilities; and lack of free time for over-worked professionals to attend scheduled sessions or meet deadlines. It cannot be overlooked that low- and middle-income countries will often have a scarcity of even the most basic forms of technology which we take for granted.[14,17,19,26–28,32] Successful programmes such as the RAFT initiative have tried to bypass the issues of Internet connectivity by using slow connections, therefore tapering the technology used to be compatible with the web resources available at the receiving end.[5] Often, difficulties faced by students in accessing these resources can lead to high attrition rates with several students not keeping up with their work or delaying their assignments; however, evidence has shown that drop-out rates are more likely to be related to personal circumstances rather than a reflection of course delivery.[24] Another major challenge identified with existing programmes is that of long-term sustainability and funding, which must be in place to ensure the longevity and far-reaching influence of such initiatives.[5]

In our institution, we have learning technologists at hand who, in conjunction with the central campus IT services, can provide rapid responses and solutions to technological problems we encounter on the learning platform. However, the same level of IT support is not available on the receiving end of tele-education, meaning that often there can be a great deal of interruption to a teaching session or barriers to accessing the online course material. Additionally, for the effective delivery of tele-education, the tutors and clinicians delivering the teaching must also be trained in delivering effective e-teaching and be well-versed in troubleshooting common problems.[13,19] To address some of the technical difficulties encountered as a result of Internet connectivity or access to the Internet, the course tutors would often have to make reasonable concessions such as allowing slightly delayed submissions or spending longer delivering the online tutorials to ensure that students were given the time to connect onto the learning platforms.

Long-distance burn education

Although the delivery of postgraduate burn care education in low-resource areas of conflict is a unique initiative, there has been a similar model of delivering teaching on the management of burns to non-specialist physicians in Australia, using videoconferencing. These healthcare professionals are often in the front line of treating these challenging injuries, much like our Palestinian students; however, their level of confidence as well as knowledge and experience in addressing burns injuries is often very limited. The experience in Western Australia confirmed that the use of videoconferencing was able to increase healthcare professionals' knowledge

and this was corroborated by the positive results of summative assessments.[7] There is evidence to support that the web-based delivery of burn prevention teaching is comparable in effectiveness to traditional classroom-based teaching, in terms of knowledge gain and retention which carries the implication that e-learning could be a valuable tool in the propagation of long-distance burn care education.[33,34] Multiple high-level evidence publications have also shown this to be true within other fields of long-distance education.[24] This was certainly reflected in the course appraisal feedback given by our students, where more than two-thirds felt that the programme had a direct improvement in their ability to manage their patients.

The cost-effectiveness of this educational intervention was not formally explored or quantified; however, as with all charity-funded educational initiatives, the investment of funding students' education is then reflected in their ability to translate that knowledge into effective clinical practice, therefore benefitting the local populous in the long term.

We appreciate that increased theoretical knowledge is just one aspect of delivering optimal patient care and that other vital factors such as hands-on experience and training, availability of workforce, the surrounding environment and access to resources all have a major role to play. None of our Palestinian cohort students had any previous exposure to formal clinical burns practice; therefore, by providing resources and educational tools we sought to empower, facilitate and enhance their clinical practice and the care they were able to offer their patients. Although this can be difficult to quantify, especially in conflict-ridden environments, formally evaluating the clinical benefit of long-distance education programmes may be useful in allowing us to fully appreciate their practical value in improving patient care and outcomes.

Conclusion

Emerging evidence increasingly supports that well-delivered, long-distance learning programmes can play a powerful role in combating inequalities in global healthcare and health education and in enabling geopolitical obstacles to be overcome. This is especially true in the field of burn care where it has been repeatedly shown that the best outcome measures in terms of mortality and morbidity are seen in those facilities implementing the most up-to-date, evidence-based treatments as promptly as possible. Therefore, it is paramount that those practitioners in resource-limited, austere zones treating large volumes of gravely injured patients have access to the education and training required to address these potentially debilitating injuries. This has certainly been corroborated by our own long-distance education initiative which has shown that targeted, flexible tele-education programmes can be invaluable for physicians treating large volumes of burns-victims under the most pressurised of resources.

The onus is both on global healthcare education initiatives, as well as established educational institutions to take active steps towards the internationalisation of their teaching provision. The successful use of technology and web-based education has the growing potential to create a 'global community' where medical education and resources are pooled and shared, meaning that patients have access to the same quality of care and healthcare professionals have access to the tools they require to offer effective treatment, regardless of geographical, social and political boundaries.

Declaration of conflicting interests

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome. The authors have all been involved in the set up and delivery of this course in their roles as course directors, convenors, content creators and assessors or in their roles as teaching fellows, organising communications, exams and teaching days.

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