Can UK healthcare workers remotely support medical education in the developing world?: Focus group evaluation

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Summary

Objectives   To evaluate the feasibility of providing regular, live, text-based teaching to medical students and junior doctors in Somaliland using a dedicated case-based medical education website (www.MedicineAfrica.com).

Design   Review of MedicineAfrica database for details of teaching sessions held in Somaliland from December 2008-October 2010 and evaluation of user experiences through focus groups.

Setting   King's College Hospital, London, UK and Ahmoud University, Borama, Somaliland.

Participants   Final year medical students, newly graduated interns and second year interns at Ahmoud University, Borama, Somaliland.

Main outcome measures   Qualitative and quantitative user rating of online case-based tutorials in the context of pre-existing educational opportunities available to them.

Results   Regular online teaching sessions are received enthusiastically by students and junior doctors and are reported to improve their clinical practice.

Conclusions   Despite technological limitations in Somaliland, a live text-based teaching service can be delivered effectively and streamlined with local curricula. This represents an alternative to traditional static

teaching methodologies currently used in international medical education.

Introduction

The 2007 *Global Health Partnerships* report by Lord Nigel Crisp (Department of Health) emphasizes the need to develop educational partnerships between healthcare workers in the UK and the developing world.[1] Although this need is most pressing in geographically and politically isolated regions, such regions also present the greatest challenge in terms of achieving sustainability and the technological capacity to maintain distance-learning, and thus far international medical education has failed to keep pace with the enhancement in global communication afforded by social networking sites such as Facebook and Twitter.

In December 2008, we established a medical education website (MedicineAfrica.com) that uses a social networking infrastructure to enable clinical teaching between a UK-based tutor and a group of tutees in any part of the world.[2] Initially piloted in response to the difficulties faced by junior doctors in Somaliland who found themselves unsupported in remote locations, the online application aims to deliver the bedside teaching experience tailored to the needs and technological limitations of a low-resource country. Students submit clinical cases to a medically qualified tutor who collates them, appends supporting materials and then delivers a tutorial online and in real-time. Such a platform is a direct response to numerous international rallies.[3–7]

Our pilot results suggested that Somaliland, a country with a poorly developed IT infrastructure, could support a low bandwidth, long-distance, instant text-based teaching system.[2] We have since developed MedicineAfrica to the point where it provides an established programme of weekly tutorials for all final year medical students and all newly qualified doctors in Somaliland in Medicine, Surgery, Psychiatry, Paediatrics and Obstetrics. The faculty has grown to include tutors from London, Oxford, Newcastle-upon-Tyne, Liverpool, the USA and from within Somaliland itself.

Commensurate with the development of the teaching programme and the faculty, MedicineAfrica has undergone a substantive upscaling in the functionality and complexity of the relational database that lies at its heart. The original organizational hierarchy of cases which are collated into clinical tutorials has been subordinated under a course structure which has enabled a stream of tutorials to be organized, *a priori* learning objectives to be defined and a complete programme of content to be delivered to selected audiences with appropriate security settings to exclude uninvited observers. This design mimics the structure of a formal teaching programme whilst providing the expandability to run multiple courses aimed at different target groups concurrently.

We report here on our experience with MedicineAfrica.com in Somaliland as a model for delivering case-based teaching in the developing world. We discuss the ways in which we have attempted to make tutorials sufficiently accessible within the confines of the tutees cultural, technological and occupational demands, as well as optimizing the teaching provided based on structured feedback. Given the increasing use of social networks and their potential application in medical education, this has relevance for both pre-existing and emerging teaching initiatives in the developing world.

Methods

The integrated electronic MedicineAfrica database was reviewed in October 2010 for number of members, number of students, number of tutors, number of teaching sessions, specialities taught, number of uploaded cases and feedback.

Qualitative and quantitative data were gathered during a trip to Somaliland in September 2010. Focus groups were held with second year interns (junior doctors) who had used MedicineAfrica over the previous year. All second year interns were invited by telephone or in person to attend a focus group meeting. Focus group questions were developed in advance by the MedicineAfrica monitoring and evaluation team to explore this group's experience of using

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MedicineAfrica and identify root causes for their difficulties.

In addition, all newly qualified interns were invited to participate in focus groups following induction into their new jobs. These were held separately from second year interns to ensure group homogeneity. None had used Medicine-Africa as doctors, though some had experienced tutorials as medical students. Focus group questions and survey questionnaires were administered to gather data on their current educational and technological provision as well as to explore their attitudes to their learning, their careers and the clinical support available to them.

The Somaliland final year medical students, all of whom were based at Ahmoud University in Borama and had not used MedicineAfrica before, were also invited to participate and respond to the same focus group questions and survey as the new interns.

Ethical approval was granted by the Research Ethics Panel of King's College London.

Results

Between July 2009 and October 2010 there were 126 tutorials encompassing 102 different cases and 778 medical images. Specialities covered were general medicine, general surgery, obstetrics and gynaecology, psychiatry, paediatrics and infectious diseases. A total of 249 users registered on the site during this time period. Of these, 20 cases were rated using the internal star-based rating system with 1 star being low and 5 stars being high. The average star rating was 4.4.

Focus group results

There were 35 participants in total: 7 final-year medical students, 17 newly graduated interns and 11 second-year interns. Twenty respondents were male. All had access to computers, were computer and Internet literate and had used live, text-based communication.

All focus groups were recorded, transcribed and then analysed to identify key themes. Consensus statements are presented below. Conflicting answers are expressed in the discussion. There was no observable domination of focus group discussions by individuals and all participants were forthcoming in their contributions.

Curriculum content

The interns who had used the site felt the content of the curriculum was appropriate. Many suggested that the tutorial content should concentrate more on the specialities they were less experienced in, such as obstetrics/gynaecology and surgery as well as rarer specialities (ENT, ophthalmology, public health). The teaching standard was consistent, pitched at an appropriate level and did not contradict what had previously been learned. Occasionally the teaching was 'too Western' and did not account for differences in culture and resources, including the local availability of investigations and options for management.

Format

The case-based format was considered to be best amongst all groups. Respondents preferred cases provided by tutors in addition to tutees, to ensure that appropriate cases were chosen to reflect learning outcomes. The tutorials were thought to complement other learning formats that the interns were exposed to, as well as being appropriate for the curriculum content and local circumstances. The ideal size for a text-based tutorial was considered to be up to six students, to allow sufficient participation by each student. A larger tutorial group would alienate and exclude tutees, and the flow of the tutorial transcript would be interrupted by too many contributions.

Delivery

Optimum frequency of tutorials was said to be at least weekly, while more frequent sessions would provide greater flexibility for working interns to attend. Tutorial duration should be between 1 and 3 hours. Evening tutorials were most convenient for interns who had to work during the day, though there would be inevitable clashes with calls to prayer in Islamic countries.

The majority of tutees accessed Internet from cafés, though some had Internet connections at home or in the university campus. There were often insufficient computers available for the number of tutees. Despite the improving technological infrastructure, many interns reported being frequently unable to attend or finish

sessions due to dropping Internet connections or electrical blackouts.

Impact

The interns felt that the tutorials had improved their clinical practice while the case-based format improved their problem solving and analytical thought.

All groups reported insufficient clinical support on the job, consequent to the paucity of doctors in the country. Any clinical questions were mostly resolved by asking each other or consulting books. Most clinical teaching tended to come from foreign doctors on visiting the country.

All groups felt more supported by the potential for clinical contact with specialists online. All reported poor career support and insufficient awareness of post-graduate exams for which they would need sponsorship to sit abroad. They felt that access to specialists abroad would help support and inform them in their career choices. However, most still intended to practice in Somaliland and none felt this was affected by the online experience.

The opportunity of South-North teaching by interns to students in the UK was received with enthusiasm. The students enjoyed the value-added feature of interacting and communicating with colleagues in other parts of the world and the engendered understanding of cultures.

Survey

All focus group participants responded to the survey.

The amount of teaching in different specialities experienced by each of the groups over the previous year is shown in Figure 1. Despite the lack of teaching, the students felt that the clinical teaching they had received, including those who had used MedicineAfrica, had a positive impact on their clinical practice (Figure 2).

E-learning

When asked to what extent they agreed on the following statements on e-learning, 12/26 agreed or strongly agreed with 'I often use the Internet to supplement my learning'; 6/25 agreed or strongly agreed with 'I have easy access to the Internet'; 9/26 agreed or strongly agreed with 'I am more

likely to use the Internet more than any other resource to find the answer to a clinical problem'; 3/25 agreed or strongly agreed with 'I regularly share cases with other users over the Internet'; 2/25 agreed or strongly agreed with 'I am regularly in contact with other clinicians from other countries over the Internet'; and 11/23 agreed or strongly agreed with 'Using the Internet makes me feel less isolated in my work and in my study.'
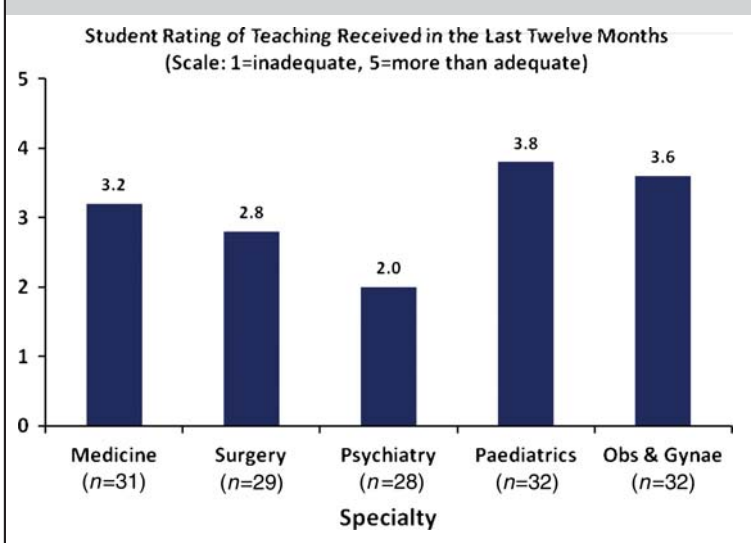
Careers and support

Regarding their career and the future, over half of respondents did not feel well supported in their career (14/26 were neutral, disagreed or strongly disagreed with 'I currently feel well supported in my career'), most did not feel like they had sufficient careers support and advice (19/25 were neutral, disagreed or strongly disagreed with 'I have access to educational mentors for any clinical/careers dilemmas I might have', 'I receive regular constructive careers advice' and 'I have access to a network of peers with whom I can swap ideas and information') (Figure 3). Furthermore, 18/23 were neutral, disagreed or strongly disagreed with 'It is easy for me to develop my specific areas of interest" while 13/22 were neutral, agreed or strongly disagreed with 'I have a clear informed idea of what I want to do in my career'. Only 6/22 agreed or strongly agreed with 'I am very likely to move abroad to practice'.

Discussion

In this paper we present the method in which we have delivered regular, live, case-based tutorials to medical students and junior doctors in the low-resource African country Somaliland. We demonstrate both the reported need for clinical support in the country[8] and the enthusiastic response towards Internet-based clinical teaching. Moreover, despite the limitations in technological capacity in the developing world, we demonstrate that a low-bandwidth, text-based teaching format can be sufficiently supported by developing infrastructure to yield regular, successful tutorials.
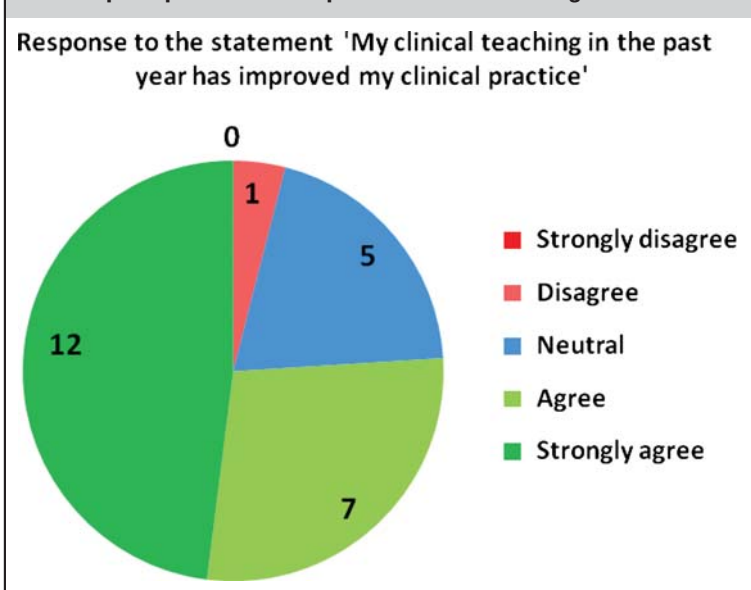
Our programme remains an exception due to the interactive, user-generated model which delivers added value in comparison to conventional

Figure 1
Adequacy of clinical teaching as assessed by students who had not used MedicineAfrica

Student Rating of Teaching Received in the Last Twelve Months
(Scale: 1=inadequate, 5=more than adequate)

doctors in Somaliland can contact senior specialists in the West for careers advice.

We recognize that the opportunity to engage with such a large percentage of the medical workforce has been critical to the success of the program in Somaliland, both in terms of allowing accurate needs assessment and in developing a shared ethos of what the program is intended to achieve. In larger countries, or those where the healthcare infrastructure is more geographically dispersed, developing a unifying framework for the program may prove more difficult. Moreover, unlike many other developing countries, there were few existing external teaching initiatives in Somaliland and introducing a case-based teaching scheme may prove more challenging elsewhere.
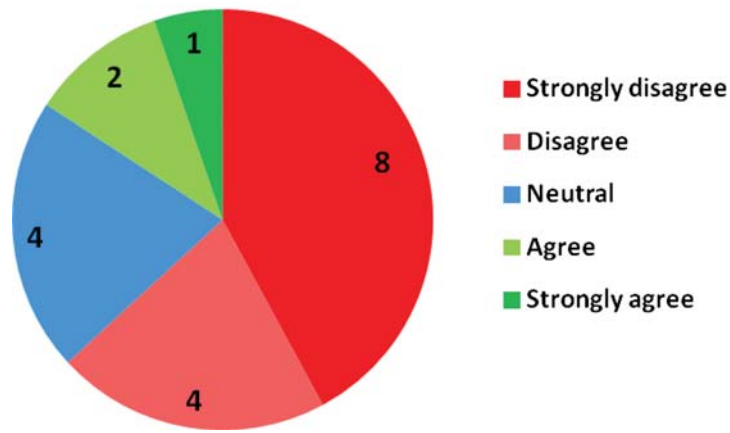
Nonetheless, the conditions and support requirements in Somaliland are shared by other low-resource countries in Africa and elsewhere: in theory, the tutorial-delivery model demonstrated by MedicineAfrica.com is therefore expandable to meet the medical education challenges of such countries. We have addressed the possibility of open access expansion for independent links to deliver teaching by substantively restructuring MedicineAfrica to facilitate autonomously functioning links, a structure which would enable engagement of a geographically disparate cadre of tutors thereby overcoming traditional personnel limitations.

online static resources. Furthermore, we have identified the role that online clinical support can play in remedying the isolation felt by doctors and students working in remote areas or in personnel limited countries, and we are able to provide a medium by which students and

We aim to continue developing the quality and relevance of the tutorial content by coordinating with the Somaliland Medical Association and Medical Schools to deliver a curriculum that complements the medical student and internship programme curriculum: as the programme expands, we will be further enabled to enlist top clinicians to deliver tutorials covering a broad range of specialties.

We will continue to develop our mechanisms for monitoring and evaluation through both intrinsic and external analytic tools. Moreover, although our current results demonstrate a perception amongst tutees that online tutorials result in improved clinical practice, it will be important to determine whether this subjective assessment correlates with objective improvements in performance: to this end, we aim to evaluate outcomes higher up the Kirkpatrick hierarchy by assessing the impact tutorials have on examination results.[9]

Figure 2
Trainee perception of the impact of clinical teaching

Response to the statement 'My clinical teaching in the past year has improved my clinical practice'

Figure 3:
Student perception of the extent of their professional support network

Response to the statement 'I have access to a network of peers with whom I can swap ideas and information'

teaching and support aimed at low-resource countries for which we have attempted to address the partners' needs and develop a variety of solutions to these needs. It may be more cost-effective and scaleable than traditional models of bedside teaching which require personnel. Moreover, we have demonstrated that the technological limitations of low-resource countries is not necessarily a barrier to effective online teaching if a text-based format is used.

MedicineAfrica is now being used more widely throughout the health partnerships movement in countries including Ghana and Tanzania. The next stage of programme expansion will involve the autonomous use of our programme by other Western institutions that harbour links with clinicians and medical students in developing countries. As the program expands, addressing local barriers to implementation and building a robust ethical and legal framework to address the problems created by sharing medical information in this way will be critical.[10–11]

Conclusion

MedicineAfrica.com is a sustainable service application of a model for live Internet-based medical

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