Title: Evaluating the bidirectional impact of a transnational tele-education curriculum for adjunct psychiatry resident didactics in a lower middle income country

Research Team Information:

- **PI Information**: Micaela Owusu MD MSc, Resident Physician in Psychiatry, Massachusetts General Hospital and McLean Hospital; Clinical Fellow in Medicine, Harvard Medical School
- **Faculty Sponsor**: Heather S. Vestal MD MHS, Instructor in Psychiatry, Harvard Medical School; Associate Program Director, MGH/McLean Psychiatry Residency Program; Psychiatry Clerkship Director, McLean Hospital; Co-Director, Clinician Educator Program, MGH/McLean Psychiatry Residency Program
- **Additional investigator**: John B. Herman MD: Associate Chief, Department of Psychiatry, Massachusetts General Hospital
- **Additional investigator**: Stephen Wemakor MD: Resident Physician in Psychiatry, Komfo Anokye Teaching Hospital (Kumasi, Ghana)
- **Additional investigator**: Gordon Donnir MD MGCPsych EMBA: Head, Department of Psychiatry, Komfo Anokye Teaching Hospital (Kumasi, Ghana); Program Director, Psychiatry Residency, Komfo Anokye Teaching Hospital (Kumasi, Ghana)
- **Additional investigator**: David C. Henderson MD: Chair, Professor, Department of Psychiatry, Boston University School of Medicine; Chief, Department of Psychiatry, Boston Medical Center
- **Additional investigator**: Christina P.C. Borba PhD MPH: Director of Research, Department of Psychiatry, Boston University School of Medicine

**RESEARCH NARRATIVE**

**Description of problem to be addressed**: Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana is one of only two training sites in Ghana for psychiatry residents. The training program is in its third year with six active psychiatry residents servicing patients in outpatient clinic, an inpatient unit, the emergency department, and in the general hospital through consultation liaison work. The psychiatry department comprises only three attending physicians among whom none have subspecialty training. As of a national mental health census conducted in 2012, there are eighteen trained psychiatrists in the entire nation of Ghana, of which there are likely many who are not practicing or do so abroad (Roberts et al. 2014). Due to the large dearth of psychiatrists in the country, the attendings have minimal time to dedicate to resident teaching as they are overwhelmed with providing clinical and education services nationwide to satisfy the tremendous need. Furthermore, they have limited ability to provide information on subspecialty topics in which they never received training themselves, such as child and adolescent psychiatry. The development of the KATH residency program has the ability to double the number of working Ghanaian psychiatrists in its first ten years, however, it has been difficult for the three attendings to provide all of the necessary didactic lessons to satisfy the training requirements mandated by the West African College of Physicians Faculty of Psychiatry. This problem is illustrative of a systemic global problem in mental health training, care, and access in low and middle income countries worldwide. One possible solution is the development of a transnational tele-education collaboration that will expose all involved parties to enhanced educational opportunities through sharing of complementary expertise.

Brief literature review: Tele-education has increasingly become a feasible option to facilitate global sharing of academic resources to address disparities in healthcare education and subsequently access and treatment. Tele-education has been defined as the use of technology to improve the knowledge acquisition of learners in a location distant from the teacher (Smith et al 2009). It is a subset of telemedicine, but explicitly not associated with direct patient care. It can be utilized in a synchronous (live visual and verbal interaction) or asynchronous (content is pre-recorded and delivered at a different time) manner (Chipps et al 2012 Worldviews; Tomlinson et al 2013). On an in-depth PubMed literature search of the terms “tele-education,” “videoconferencing and education,” and “distance learning,” the majority of published studies relevant to medical specialties described models of asynchronous video modules or synchronous video conferencing utilized within high income countries for distribution to their own rural settings. There is a smaller literature describing tele-education endeavors within low and middle-income countries for distribution to their own rural populations (Chipps et al 2012 African Journal; Mar 2014). Research studies or case reports describing synchronous tele-education transnationally between high and low-income countries was found in only one case of obstetrics and gynecology (Boatin et al 2015), but no such studies exist in psychiatry. The use of synchronous videoconferencing for medical tele-education has been shown to be beneficial and qualitatively reported as largely equivalent by learners (Smith et al 2009; Tomlinson et al 2013). Given the recent global acknowledgement of mental health as a priority (as with the World Bank’s April 2016 meeting entitled Out of the Shadows: Making Mental Health a Global Priority), exploration of solutions for capacity building through education are critical. Transnational tele-education efforts in this regard are both critical to satisfy global need and enriching bidirectionally due to their ability to expose participants on each side to issues of culture, resource allocation, and clinical decision making in different practice settings (Boatin 2015). This study will be the first to use a synchronous transnational tele-education effort to increase resident training capacity within the field of psychiatry.


Hypothesis: We specifically propose to: 1) Compare the availability of didactics for psychiatry residents at KATH to the domains of study mandated through the West African College of Physicians Faculty of Psychiatry syllabus before and after this educational intervention to demonstrate the utility of transnational tele-education to improve access to subspecialty knowledge. 2) Compare the confidence of Ghanaian psychiatry residents at KATH in caring for patients with specialized psychiatric presentations before and after this educational intervention 3) Assess the attitudes of Massachusetts General Hospital, McLean Hospital, and Boston Medical Center attendings, fellows, and residents towards psychiatric training and practice in low income countries before and after exposure to foreign learners through this educational intervention. 4) Compare the global psychiatry knowledge base of US-based attendings, fellows, and residents before and after participating in the tele-education knowledge exchange. 5) Qualitatively explore barriers to and difficulties encountered when implementing a transnational synchronous tele-education curriculum.

Population to be studied: The primary study population are the six psychiatry residents and two house officers (equivalent of interns who rotate through multiple hospital specialties for 2 years after graduation from medical school) currently in training at Komfo Anokye Teaching Hospital (KATH) within the Department of Psychiatry. The secondary study population are the residents, fellows, and attendings of Boston-area institutions -- Massachusetts General Hospital (MGH), McLean Hospital, and Boston Medical Center (BMC) -- who will serve as the didactic instructors, seminar leaders, and conference participants in our two way knowledge exchange.
Description of intervention/study design: IRB Submission: This study is in the process of being submitted for IRB approval through both the Partners IRB in Boston, Massachusetts and the Ghanaian IRB in at Komfo Anokye Teaching Hospital of the Univesity of Science and Technology in Kumasi, Ghana. The study design does not utilize any clinical tele-medicine or direct patient involvement. All discussion of specific patient presentations occurs through case conference formatting with de-identification of patient data in accordance with the institutional and local policies of both the Kumasi and Boston-area institutions, including HIPAA compliance.

Recreation of learners at KATH: All eight house psychiatry residents and house officers currently rotating through the department of psychiatry at Komfo Anokye Teaching Hospital in Kumasi, Ghana will be recruited for participation in the tele-education curriculum and study by their program director and co-investigator in this study, Gordon Donnir.

Needs Assessment: An assessment of the strengths and weaknesses of didactic topics in the existing KATH psychiatry resident educational curriculum will be assessed using two methods: qualitative and quantitative. Qualitatively, the program director and residents of KATH will describe topics in which they would like to receive further clinical instruction on the basis of the cases they see in their hospital. Additionally, clinical observations will be made by the principal investigator, Micaela Owusu, during in-person visits to KATH regarding perceived strengths, weaknesses, and breadth of existing didactics and clinical knowledge as compared to the variety of cases that present in the hospital. Quantitative needs will be assessed through a pre-intervention survey described below.

KATH Pre-intervention Learner Questionnaire: Prior to administration of the pilot lecture series, all eight KATH psychiatry residents and house officers currently rotating through the department of psychiatry at KATH will complete a questionnaire adapted from Borba et al 2015. The questionnaire is designed to survey participant demographics, training history in medical school, housemanship, and psychiatry residency, the current perspectives on how many lectures they receive, the specific diseases to which they are exposed in their clinical training, and their confidence by Likert scale in the 24 syllabus content areas identified by the West African College of Physicians Faculty of Psychiatry as necessary to achieve competence as a psychiatrist. The information obtained in this questionnaire will be de-identified and primarily utilized by the principal investigator from MGH to protect the anonymity of the subjects. Borba CP, Gelaye B, Zayas L, Ulloa M, Lavelle J, Mollica RF, Henderson DC. Making strides towards better mental health care in Peru: Results from a primary care mental health training. Int J Clin Psychiatry Mental Health 2015;3(1):9-19.

Recruitment of lecturers and case conference participants at MGH, McLean, and BMC: Upon identifying the most underserved syllabus content areas through the qualitative and quantitative methods described above, the principal investigator will work with faculty supervisors in the Boston area to identify expert lecturers specific to each topic. These lecturers will include individuals with known positive records of teaching the topic to local residents or senior and chief residents with identified interest in the topic. Email Invitations will be sent to the identified lecturers requesting that they volunteer 1-2 hours of their time to engage and teach the KATH residents on the specified topic. Lecturers will be provided 1-2 paragraphs of information about the tele-education initiative, but limited specific information regarding clinical practice or culture in Ghana prior to the lecture date. Most lecturers will not require significant preparatory work as the lecture will be similar or identical in content to one given to local residents previously.

Boston-area Pre-lecture Teacher Questionnaire: Just prior to the lecture, in the presence of the principal investigator, Boston-area lecturers will be asked to complete an online pre-lecture questionnaire that surveys their basic knowledge of and attitudes towards Ghana’s culture, health system, psychiatric education system, clinical presentations, and treatment options. In addition, it will briefly explore their understanding of cross-cultural psychiatry and tele-education.

Lectures: Videoconferencing will be conducted through Google Hangouts. Fifteen minutes prior to lecture start time, co-investigators Micaela Owusu (MGH/McLean) and Stephen Wemakor (KATH) will “meet” online to confirm connection. The Boston-area technical setup includes a desktop computer with attached Logitech webcam and microphone through which the lecturer is video and audio-streamed and a second laptop computer with muted sound and microphone from which the powerpoint presentation is screen-shared through Google Hangouts. As such, within the Google Hangouts image viewed at KATH, Boston is represented in two screens. The KATH technical setup includes a
resident’s personal laptop computer with built-in speaker and microphone from which the Google Hangout session is viewed. They have the option of projecting this laptop image to a 36” television screen and thereby seeing both the powerpoint and lecturer through the Hangouts view or of using a second personal laptop from which the powerpoint presentation that has been previously sent to them is viewed directly from the hard drive. The Boston connection uses wired hospital-based internet for the desktop and wireless hospital-based internet for the laptop. The KATH connection uses wired hospital-based internet for the laptop connected to the Google Hangout. For ease of transmission and minimization of slowed connection, bandwidth within Google Hangouts is adjusted to 360kbps. Co-investigators Stephen Wemakor and Micaela Owusu are the designated technical problem solvers on either end of the connection if failures occur. A Whatsapp cellular connection between these two parties and the Ghanaian program director and investigator Gordon Donnir ensures continued communication if internet connection slows. In the event of failed video transfer, the didactic is encouraged to continue through audio-only using Whatsapp. Boston-based lecturers are encouraged to make the didactic interactive and to request and answer questions throughout and at the lecture’s conclusion. Ghana-based learners are encouraged to be active participants, to ask questions, to teach about their experiences, and to comment on how experiences may be similar or different to those of the lecturer.

_Audiorecording:_ All lectures will be audiorecorded for the purpose of obtaining qualitative audio data regarding connectivity interruptions and verbal information regarding the experiences on both the KATH and Boston-area.

_Lecture Feedback:_ Following each lecture, all attendees from KATH and Boston-area institutions (including learners and teachers alike) will receive an emailed feedback document through Google Forms that asks about the most important learning points and questions that arose for them in the session. It explores the relevance of the lecture and how it can be improved in the future.

_Boston-area Post-lecture Teacher Questionnaire:_ The Boston-area teacher receives a post-lecture questionnaire that is identical to the pre-lecture teacher questionnaire to assess their basic knowledge of and attitudes towards Ghana’s culture, health system, clinical exposures, and treatment options and explores their understanding of cross-cultural psychiatry and tele-education.

_Post-intervention Learner Questionnaire:_ KATH subjects will provide updated perspectives on their training at three time intervals: at completion of the pilot (after 10 lectures), after 6 months (following a second phase of additional lectures and improvement in the protocol on the basis of pilot data), and after 12 months. As in the pre-intervention questionnaire, they will provide information regarding how many lectures they receive weekly, the specific diseases to which they are exposed in their clinical training, and their confidence by Likert-scale in the 24 syllabus content areas identified by the West African College of Physicians Faculty of Psychiatry as necessary to achieve competence as a psychiatrist.

_Description of comparison group (if relevant):_ There is no explicit comparison group in this study design. However, due to the use of pre- and post-intervention and lecture questionnaires, each subject will provide their own baseline data to which a comparison can be made after intervention.

_Outcome variable to be used to determine efficacy of intervention (if relevant):_ Study data will be analyzed using both quantitative and qualitative methods. Free response survey questions, audiorecordings, and email exchanges will be coded to identify themes regarding such topics as communication, culture, attitudes, criticisms, successes, and a number of additional domains. Likert-scale quantitative data from pre- and post-intervention questionnaires will be compared to assess for the impact of the intervention on KATH resident confidence and Boston-area lecturer attitudes and knowledge of global psychiatry.

_Power analysis to determine feasibility (if relevant):_ n/a

_Timeline:_ Components of the study have already been initiated such that pilot implementation of 10 didactics over 12 weeks is actively in process with a completion date of October 25, 2016. Initial steps that have already been completed include a one day visit by principal investigator Micaela Owusu to KATH to meet the program director and residents that
occurred in February 2015. She subsequently returned for one week in November 2015 to observe activities within the KATH psychiatry department that informed subsequent aspects of the educational needs assessment. KATH faculty sponsor Gordon Donnir visited MGH on two occasions in November 2015 and May 2016 to meet with MGH and BMC faculty sponsors Carol Wool, John Herman, and David Henderson and principal investigator Micaela Owusu to consolidate the relationship and develop logistical plans for implementation. In November 2016, investigator Micaela Owusu plans to return to Ghana at which time she will conduct in-person follow-up assessments and observations to determine next steps in advancing the curriculum, improving the technology, and sustaining the relationship. Data analysis, transcription, and qualitative analysis of the pilot will occur in December 2017. We anticipate initiation of a second series of weekly didactics beginning in January or February 2017.

**HIPPA compliant/IRB status:** The protocol will be submitted for IRB.

**Clarification if needed:** See above in study design for further information

**BUDGET**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Conference room bundle for use at KATH – wide lens camera and multidirectional microphone</td>
<td>$800</td>
</tr>
<tr>
<td>Mac Minicomputer with $20 educational discount and $43 estimated tax</td>
<td>$722</td>
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<tr>
<td>Apple HDMI to DVI adapter</td>
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<tr>
<td>Wireless mouse and wireless keyboard</td>
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<tr>
<td>Video recording equipment rental</td>
<td>$200</td>
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<tr>
<td>Air travel from Boston to Accra to Kumasi and return for principle investigator Micaela Owusu</td>
<td>$1199</td>
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<tr>
<td><strong>TOTAL REQUESTED</strong></td>
<td><strong>$3000</strong></td>
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**Disclosure of other funding sources:** This grant would be sole source of funding.

**Explanation if provided:** As noted above, Principal Investigator Micaela Owusu has also applied for the fall funding cycle of the COE travel grant, which she would use to fund her travel to Ghana for both this educational project as well as a medical student teaching project at a different institution (University of Cape Coast School of Medical Sciences) in November 2016. If awarded the travel grant, the partial funds allocated for travel would be used to supplement the travel of a Ghanaian investigator to come to the US. The majority of the budgeted funds for this medical education project are not for travel, but rather for technological advancements to improve and sustain the medical education project.

**LETTERS OF SUPPORT**

**Program Director:** Felicia Smith, MD  
**Mentor Name:** Heather Vestal MD MHS & John Herman MD  
**Letter received?** yes

**OTHER**

**Did you use the HMS feedback partner opportunity?** no

**Previous COE involvement:** I applied for the fall 2015 travel grant, which I did not receive. I have also applied for the fall 2016 travel grant.  
**Previous COE funding:** None
Understand all grant requirements and expectation? Yes

Is this your last year in your training program? Yes
Can we post your application on our website if funded? Yes