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Virtual class room as a learning format in a family medicine residency program: Lessons learned in Palestine

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ABSTRACT

Purpose: Due to geopolitical and socioeconomic challenges, the Family Medicine (FM) speciality in Palestine is in early stages of development. Volunteer British General Practitioner (BGP) trainers worked with FM faculty to develop an online tutorial program (OTP) and a novel evaluation framework E-QUaL (Evaluation-Quality, Utilization and Learning) to enhance residents' patient-centered communication and clinical skills.

Materials and methods: Three OTP cycles were facilitated and evaluated at An Najah National University (ANNU) in Palestine between 2017–2020. Qualitative data were collected during focus groups and online chats and analysed.

Results and conclusions: The development and joint facilitation of the OTP developed faculty skills and enhanced clinically oriented education. The collaborative (BGPs and ANNU faculty) approach and the use of the EQUaL framework helped to identify and address strengths and opportunities as well as the challenges and threats of the educational content and the virtual learning format with each iteration. The COVID pandemic provided a new and inexpensive platform which improved training quality. Issues such as the volunteer nature of BGPs, internet instability, and differing cultural approaches and expectations between physicians and patients were addressed in a continuous quality improvement approach and continues today. This may be a useful model in other low resourced settings.

Introduction

Family Medicine (FM) was first established in the West Bank in 2011, but the specialty is still developing due to geopolitical and socioeconomic challenges. Clinical sites with experienced tutors are under-developed and faculty members are young in their academic careers with few opportunities for institutional linkage or robust faculty development. British General Practitioner (BGP) trainers volunteering with two non-government organizations (NGOs) have collaborated with the Family Medicine division at An-Najah National University (ANNU), the only FM residency program in the West Bank, and began an online tutorial program (OTP) in December 2016 to address some of these challenges. The OTP is funded by the NGOs and offered to FM residents at some point during their four-year residency.

Practice points
- Family medicine is a new specialty in Palestine and faculty are early in their academic careers.
- An online training program was collaboratively developed and evaluated by volunteers from the United Kingdom's General Practice and An Najah National University Family Medicine faculty.
- Three cycles of evaluation were carried out using the E-QUaL framework which examined strengths, opportunities, challenges and threats.
- Challenges and threats were addressed in a continuous quality improvement approach.
- This training and evaluation model may be useful in other low-resource countries.

Online tutorial program (OTP)

The aims of the OTP are to improve FM skills including: (1) enhance patient-centered communication; (2) reinforce a whole person approach; (3) strengthen professional values, attitudes and behaviours; and (4) develop skills for managing complex cases over time. BGPs who are experienced teachers in Family Medicine planned the tutorials in conjunction with ANNU FM faculty. Topics vary according to the level in residency. However, all of the cases are related to common primary care issues. During the first and second years of residency, communication skills and consultation methods are the focus. In the third year, an approach to common primary care cases is developed with attention to continuity. A formative assessment evaluates the session through verbal and written comments. Rooted in educational theory and strategies (Fenwick, Nerland, and Jensen 2012) (Kirkpatrick 1996) the OTP focuses on agile development and feedback in a continuous quality improvement approach. See Table 1 for a description of the three cycles undertaken between 2017 and 2020.

Table 1. The online tutorial program (OTP) has been running since December 2016 as a means for British GPs to enhance the clinical knowledge and patient-centered practice skills to FM residents and develop the teaching skills of FM faculty in the West Bank.

	First cycle (2017–2018)	Second cycle (2019)	Third cycle (2020)
Online platform	Chat based platform. (Medicine Africa[a]) Residents respond with typing Accessed in classroom at ANNU	Enhanced platform (Braincert[b]) with media features including video and audio, but residents respond with typing Accessed from home	Zoom platform[c] (became available summer 2020) Accessed from home
Resident participants/Level from 4 years	13 Residents , Years 2 + 3	5 Residents, years 1–2	5 Residents, years 2–3
Faculty	ANNU FM Numerous BGP English speaking only	ANNU FM One BGP English only	ANNU FM Add English + Arabic speaking BGP (only one) with experience in Jordan
Teaching style	Lecture + case simulations	Lecture + case presentations, add small group work.	Resident present cases
Post session	Class report by faculty	Class report written by resident	Self-reflection encouraged via WhatsApp
Sample topics	- Approach to patient with fatigue. - Management of complex patient. - Approach to anaemia how read CBC. - Approach to constipation in infant, child, adult. - Approach to pruritus . - Nail-biting in children. - Approach to colicky baby.	- The doctor patient relationship. - The clinical consultation. - Medical case in ethics. - Leadership. - Obesity and weight management. - Review essential drug list and what to follow if a patient on and side effects	- Diabetes complication management. - Common Mental health problems. - Polypharmacy in elderly patient. - Children with rash Fatigue - Approach to lower back pain. - Approach to red eye.

[a]Platform developed in Oxford England (https://medicineafrica.com/)-purchased by NGOs.
[b]https://www.braincert.com/–purchased by NGOs.
[c]ANNU purchased license for faculty and students.

Volunteer English-speaking BGP trainers presented on an online platform. Class size varied between five and thirteen over the three cycles of the OTP. Participating residents were generally in the second or third years of the four-year residency program. Sessions were held not more often than monthly six time a year. ANNU faculty played a key role in logistics and liaising with the residents. In the process, ANNU faculty gained skills and experiences around co-production of teaching materials, course organisation and management. Residents and faculty were shifted from a lecture-only format, which they were used to, to a participatory approach with small group work and interactions with the BGP trainer and ANNU faculty.

Evaluation of the OTP

Because the ANNU faculty and residents were familiar with the Strengths, Challenges, Opportunities and Threats model (SCOT), we built on this to create an easily actionable evaluation framework. Common frameworks for evaluating technological innovation included SEIPS (Carayon et al. 2006) the usability checklist (Asarbakhsh and Sandars 2013), assessing quality (Attwell and Hughes 2010), the 5-point framework of learning experience (Carroll et al. 2009) and Kirkpatrick's 4-level programme evaluation (Kirkpatrick 1996). We extracted and integrated common and relevant dimensions from these frameworks to create a novel framework, the E-QUaL (Evaluation-quality, utilization and learning). The three domains of evaluation – quality, usability, and learning – were incorporated within a SCOT framework. We evaluated the OTP at three intervals with this framework. In this study, we present the use of the novel E-QUaL framework to evaluate and improve the OTP delivered to Palestinian FM residents by BGP volunteer trainers in collaboration with Palestinian FM faculty over three learning cycles.

Methods

The continuous quality improvement approach over three cycles occurred between 2017 and 2020. Each cycle had a planning or updating period, the intervention delivery, and the evaluation. Both the OTP (the intervention) and the E-QUaL framework (evaluation) were developed collaboratively by BGP trainers and ANNU FM faculty. Lessons learned from the evaluation were used to improve the next cycle of the OTP (Figure 1).

Data collection and analysis

The data collection for the first evaluation (EVAL#1) included a 60-minute focus group held online in December 2018 with residents who completed OTP#1 as second and third year residents. Participants were purposively selected for gender parity and from different geographic regions. (Kuzel 1999). Three female and three male residents were chosen from the 13 residents who participated in OTP #1. They represented a selection from across the West Bank (3 north, 1 central, 2 south).

The topic guide included general questions grounded in the residents' experiences, and question probes drawing on a preliminary literature review and an internal evaluation report produced in November 2017. The data was retrieved in an online chat focus group that lasted for 60 minutes with residents typing their responses to the questions posed by the BGP trainer/researcher (HS). It was downloaded and coded by three independent researchers (HS, SH and ZN) who also performed the content analysis using a directed qualitative analysis approach (Hsieh and Shannon 2005). Procedures included open coding identifying themes and subthemes and then assigning them to

Development of OTP and E-QUaL evaluation model planned collaboration of BGP trainers and ANNU faculty

2018
EVAL #1: Focus Group online
with 6 residents

Evaluation + analysis using
E-QUaL framework

2019
EVAL #2: Face to face
Workshop with 5 residents, 1
ANNU faculty and 1 BGP
trainer, evaluation + analysis E-
QUaL framework

Improvement by:
Arabic speaking BGP
Using Zoom platform

2020
EVAL#3: Evaluation from
analysis of data in WhatsApp
discussion and BGP trainer's
and ANNU faculty's reflections.
Analysis E-QUaL format

2018
OTP#1 for 13 residents, 6
sessions delivered each year

Improvement by:
Choose One BGP's
trainer
Upgrade the old
platform

2019
OTP#2 for 5 residents 6
sessions delivered per year

2020
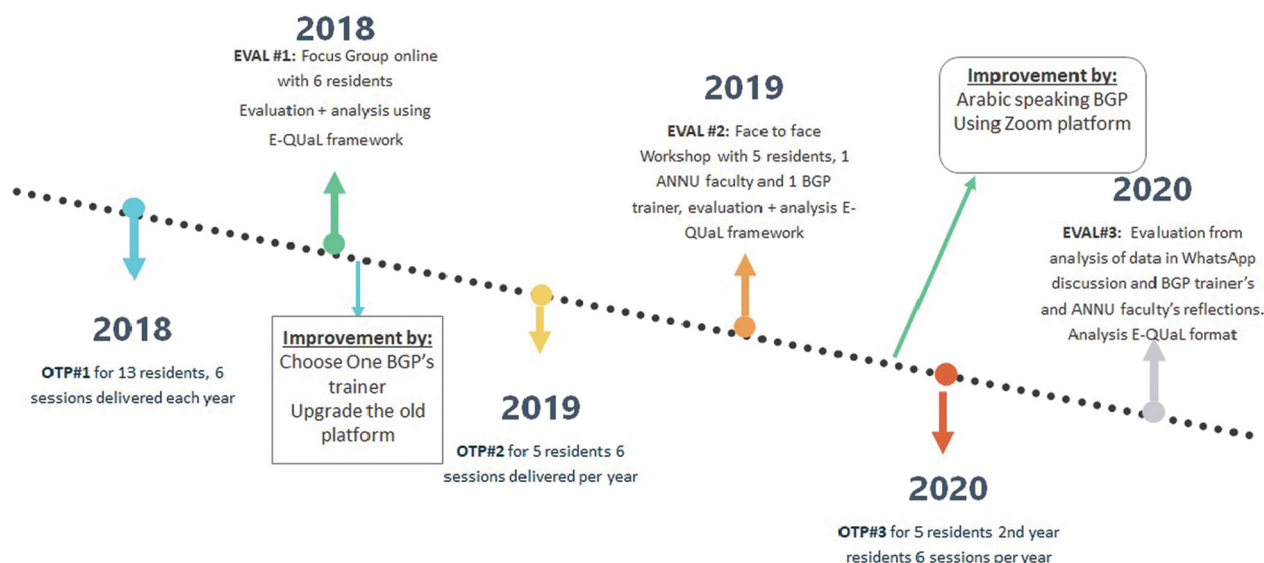OTP#3 for 5 residents 2nd year
residents 6 sessions per year

Figure 1. Approach to online tutorial (OTP) development, session delivery, and evaluation.

categories in the E-QUaL framework. Disagreements were discussed until consensus was reached.

The feedback from the focus group was shared with residents and in consultation with ANNU FM faculty and BGP trainers, OTP#2 was restructured and delivered between January and June 2019 to a new cohort of five residents.

Evaluation for OTP#2 (EVAL #2) was conducted during a one-hour face to face discussion. BGP trainers were in Palestine for a conference in November 2019, and consequently, the evaluation was done in person. Residents worked together in small groups to complete an interactive activity and group discussion requiring them to reflect on their experiences during OTP#2 and to organize them using the E-QUaL framework. One BGP trainer (HS) and one ANNU faculty member (SH) co-facilitated the session. Flipcharts and notes taken during the final discussion were analysed (HS and SH) using the directed qualitative analysis approach (Hsieh and Shannon 2005) and data were organized in the E-QUaL framework. Findings were used to guide changes to OPV#3.

OPV#3 was held during 2020 with the same five residents in their second and third year of residency. Although sessions were on hold for three months due to the COVID pandemic, six sessions were completed during 2020. This iteration was evaluated (EVAL#3) by using the residents' reflective feedback in WhatsApp chats and the trainer's and faculty member's longer written reflections after each session. The WhatsApp questions posed were: *What worked well? What didn't work? What are suggestions for improvement*? Chat data were analysed (SH and TZ) in the same manner as described previously and organized in the E-QUaL framework.

As this research was conducted on educational strategies and practices, the ANNU ethics board considered it exempt from review.

Results

The participants in the OTP were at various stages in their family medicine residency program. There were five males

and eight females in the first group, a smaller group participated in the evaluation. The same five females participated in the second and third OTPs and all were part of those evaluations. Residents' ages range from 28 to 35 years. They are all fluent in English as a second language.

Supplementary table summarizes the various types of feedback received from residents over the cycles of the evaluation. The evaluation results of each iteration of the OTP are presented along with the changes made to the next OTP.

OTP/Evaluation #1

Three female and three male residents were chosen from the 13 residents who participated in the six session of OTP #1 to join in the focus group. Based on this evaluation, one BGP trainer facilitated all the tutorials during OTP#2 instead of having different trainers conduct each session. This allowed residents to become familiar with one BGP's style, addressing the learning threats of 'language issues' and 'switching external professionals.' One ANNU faculty (SH) was made responsible for the tutorials which addressed the 'disorganized' learning challenge. The platform was upgraded to add audio and video to improve communication and 'minimize the language challenges for non-Native English speakers,' and enhance 'human contact' (usability challenges and threats).

OTP/Evaluation #2

During 2019, six sessions were held not more often than monthly for a new group of five residents at the end of their first year and starting the second year of residency. All five residents participated in the face to face evaluation discussion. Based on the quality challenge of 'residents' varied English skills' and the quality threat of 'cultural mismatch,' one BGP trainer who spoke Arabic and had spent five years

training general practice physicians in Jordan was recruited to facilitate the third OTP alongside the same ANNU faculty. The COVID pandemic made the Zoom platform more readily accessible and familiar, enabling residents to quickly gain proficiency and overcome the usability challenges of: 'typing takes time' and 'cannot reply to chat in real time' by moving to video based interactions in real time.

OTP/Evaluation #3

Six sessions were held not more than monthly for the same five second year residents in 2020. The BGP trainer valued reflection in his own training and added reflection after each tutorial for all involved–residents, faculty and the trainer to further enhance the learning/strength of 'critical thinking' and to have more immediate feedback to make improvements from one tutorial session to the next. The Zoom platform was addressing many of the earlier challenges. Playing videos and sharing photos was easier as was small group work. The Arabic speaking BGP with regional experience also eliminated the language barriers and had a better understanding of the culture. However, the BGP's approach to patients was different than what was done in Palestine. (Supplementary table, ANNU faculty Challenge/Quality). Typically, Palestinian physicians will do what the patient and family want, even order unnecessary x-rays or give antibiotics when they are not needed.

Limiting the session to one hour was unrealistic, so in the next iteration tutorial sessions have continued until all residents' questions are addressed and the discussion concludes, usually 90 minutes at the most. As a result of the feedback to make clinical cases more relevant and to further engage residents in their learning, specific residents are asked to prepare a case and identify pertinent articles, guidelines or other preparatory materials which are shared before the tutorial. Residents are encouraged to review these ahead of time and come prepared for the discussion.

Discussion

We used the novel E-QUaL framework to examine the perspectives of Palestinian FM residents using a virtual learning environment over three learning cycles with transnational support from BGP trainers alongside ANNU faculty. In the third cycle we included perspectives from the trainers and the ANNU faculty. Our study is an example of a Combination-Of-Perspectives (COOP) model in action, (more commonly known as participatory design), which can be a useful tool when (re)designing a learning environment (Könings et al. 2005). It is not surprising that we found that a transnational virtual learning environment has strengths and opportunities, but also challenges and threats that need to be addressed in a continuous quality improvement approach.

The strengths of our program according to the residents were experiencing a new style of learning and promoting critical thinking, reflective learning, and a holistic, person-centred and systematic approach to patients hitherto not delivered by faculty in the West Bank. Other key strengths included enhanced communication and consultation skills, improved empathy, patient rapport and satisfaction, and improved skills in clinical practice. These highlight the real life impact that the programme delivers. Residents valued interacting with international tutors and learning about FM in established settings.

Technology support was identified as crucial and residents reported challenges with the initial learning platforms that lacked human contact. As a positive unintended consequence of the COVID pandemic, the rapid adoption of Zoom, allowed real time video. However, intermittent electricity and internet access remained notable threats, and sometimes cameras were turned off to manage the low bandwidth.

There was mixed feedback about group work, the number of cases for discussion and their complexity, and the use of virtual patients for role plays for the first two cycles. Some of this was adressed by transitioning to an interactive learning setting, which improved with experience. The addition of an Arabic speaking BGP trainer with regional experience helped to overcome the language and cultural barriers in OTP3. However, cultural mismatches in a physician's approach to patients' requests were still a problem. To address this and to enhance the learning experience for residents, asynchronous discussions, mentoring, and support between tutorials were added during OTP3. This encouraged reflection and consolidated of learning as the BGP trainer responded to WhatsApp queries about clinical questions between tutorial sessions.

The voluntary nature of the BGP trainers means different trainers will lead the instruction over time. Hence, the involvement of ANNU faculty was imperative and their participation in evaluating and re-designing each cycle with BGP trainers underlined the importance of co-production. ANNU faculty's skills grew. For example, SH's awareness of the Arab cultural tendency to avoid critical feedback (Bunt-Kokhuis and Weir 2013) identified learning needs for the residents around becoming reflective practitioners, helping each other, and the commitment to ongoing professional development. As a result, SH began normalizing the sharing feedback, positive and negative, early on with the third cohort of residents. OTP/Eval #3 showed the benefits of this effort.

Despite collaborative efforts, the threats included cultural and contextual mismatch, different clinical pathways, and the gap between 'ideal' consultations demonstrated in the tutorials and the reality of working in resource strained settings. As the globalisation of medical education continues through increased digitilization, conscious development of culturally sensitive and contextually relevant teaching materials will become even more important.

The iterative, responsive and agile development of the OTP with evaluation at the centre of co-creating a unique transnational learning environment is an innovation in medical education that can be adapted and built on in multiple settings in countries with transitioning healthcare systems including FM, especially under challenging geopolitical circumstances. It can support the development of patient-centred skills, critical thinking and address professional development and isolation.

Applying the E-QUaL framework was straightforward with high agreement during the consensus process in OTP/EVAL#1. For OTP/EVAL#2, comparing the application of the framework by the residents and the researchers showed agreement as the participants become more acquainted with the framework. Consistency, reliability and reproducibility were noted across all three cycles and also between residents, BGP trainers and ANNU faculty, as evidenced in

the results. However, testing these formally in future evaluation cycles is imperative.

The limitations of this study included a small sample size, a lack of quantitative data for triangulation, and data on tutors and faculty perspectives not gathered until the third iteration. The virtual nature of the feedback also risks omitting important non-verbal cues. Since the feedback was conducted in English, which is not the residents' native language, significant information may have been lost. Nevertheless, this study demonstrated the value of co-production and a continuous quality improvement approach to the OTP to address the needs of developing Family Medicine programs. The virtual nature of the OTP allowed ANNU to interact with residents during the pandemic and also addressed the travel challenges in Palestine due to checkpoints and road closures that are part of daily life.

The OTP continues today for the ANNU family medicine residency and sessions attempt to balance clinical knowledge and professional skills development, by asking residents to reflect on their learning experiences and needs at the end of each tutorial session. The co-production format has been expanded to continuing education for practicing family physicians in both the West Bank and Gaza through the Palestinian Association of Family Medicine.

Ethical approval

This study was performed following the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Institutional Review Board (IRB) of An-Najah National University (No. 9 Dec. 2018). All subjects involved in the research were invited to participate voluntarily after the study's purpose as well as the risks and the benefits of participation were explained. Informed consent was obtained from all individual participants is included in the study.

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Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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