

ORIGINAL RESEARCH

Comprehensive On-site Medical and Public Health Training for Local Medical Practitioners in a Refugee Setting

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ABSTRACT

Objectives: In refugee settings, local medical personnel manage a broad range of health problems but commonly lack proper skills and training, which contributes to inefficient use of resources. To fill that gap, we designed, implemented, and evaluated a curriculum for a comprehensive on-site training for medical providers.

Methods: The comprehensive teaching curriculum provided ongoing on-site training for medical providers (4 physicians, 7 medical officers, 15 nurses and nurse aids, and 30 community health workers) in a sub-Saharan refugee camp. The curriculum included didactic sessions, inpatient and outpatient practice-based teaching, and case-based discussions, which included clinical topics, refugee public health, and organizational skills. The usefulness and efficacy of the training were evaluated through pretraining and posttraining tests, anonymous self-assessment surveys, focus group discussions, and direct clinical observation.

Results: Physicians had a 50% (95% CI 17%-82%; range, 25%-75%) improvement in knowledge and skills. They rated the quality and usefulness of lectures 4.75 and practice-based teaching 5.0 on a 5-point scale (1=poor to 5=excellent). Evaluation of medical officers' knowledge revealed improvements in (1) overall test scores (52% [SD 8%] to 80% [SD 5%]; $P<.0001$); (2) pediatric infectious diseases (44% [SD 9%] to 79% [SD 7%]; $P<.001$); and (3) noninfectious diseases (57% [SD 16%] to 81% [SD 10%] $P<.01$). Main barriers to effective learning were lack of training prioritization, time constraints, and limited ancillary support.

Conclusions: A long-term, ongoing training curriculum for medical providers initiated by aid agencies but integrated into horizontal peer-to-peer education is feasible and effective in refugee settings. Such programs need prioritizing, practice and system-based personnel training, and a comprehensive curriculum to improve clinical decision making. (*Disaster Med Public Health Preparedness*. 2013;7:82-88)

Key Words: Refugee camp, on-site training, health personnel, training curriculum

Displaced populations in complex humanitarian emergencies experience a high burden of health issues,¹ yet often have limited access to health care services for a variety of reasons, including a shortage of health workers.² Camps for refugees and internally displaced persons often have only a small number of medical personnel and/or physicians servicing thousands of people.³ Moreover, most refugee settings become long-term facilities because the main causes for the conflict are not resolved quickly.⁴ It is essential that the providers are adequately trained to treat and manage a broad range of medical and public health problems specific to long-term refugee populations.⁵ However, historically health providers have not received even systematic training, never mind comprehensive on-site and ongoing training during crises.^{6,7}

Many health workers are employed by international aid agencies, and training is usually specialized for a

specific disease or health topic such as human immunodeficiency virus, reproductive health, and malaria.⁸⁻¹⁰ Many programs have sought to recruit and train lay people as community health workers (CHWs) to provide very basic health services, for example, as traditional birth attendants.^{3,11,12} Although evidence suggests that such specific trainings can effectively improve selected health measures, it can lead to inconsistent and sporadic skill sets among the medical providers working with displaced populations and would not address the wide range of longstanding medical and public health issues.¹³ Furthermore, "vertical" or disease-specific efforts often only succeed in the short term¹⁴; evidence suggests that irregular coverage of diseases in training leads to the overdiagnosis, misdiagnosis, or underdiagnosis of diseases.¹⁵ Sporadic training is often clinically oriented, lacks a public health or epidemiological approach,^{16,17} and lacks practice-based learning.

TABLE 1
Educational Domains and Topics for Didactic Sessions and Teaching Rounds

Refugee Public Health	Clinical Diagnosis and Management	Organizational Skills
Basics of complex emergencies: <ul style="list-style-type: none"> ● Leading infectious diseases (diarrheal diseases and respiratory infections) ● Mass vaccination campaigns ● Malnutrition ● Child health and mortality ● Reproductive health Principles of community-based approaches Epidemiological concepts Principles of water and sanitation	Common outpatient and inpatient pathologies Infectious/tropical diseases Chronic noncommunicable diseases Mental health disorders Genitourinary and gynecological disorders Critical care <ul style="list-style-type: none"> ● Intensive care unit admissions ● Isolation cases Clinical decision making Ethics in health and human rights	Communication skills <ul style="list-style-type: none"> ● Giving and receiving feedback, teamwork Medical information systems <ul style="list-style-type: none"> ● Charting ● Sign-in and sign-out ● Consultation Sustainable educational initiatives <ul style="list-style-type: none"> ● Morbidity and mortality reports ● Continuous medical education programs ● Peer education

Also, it commonly is not offered on-site, which requires health workers to travel elsewhere and reduces the time and efficiency for patient care. Furthermore, lack of ongoing training and field support contributes to poor compliance with standard guidelines and promotes symptomatic therapies and inefficient use of limited resources.⁷

Very limited data are available on the availability or efficacy of comprehensive on-site training programs for medical providers working with displaced populations. To address this lack, we have designed and implemented an educational curriculum in a camp for internally displaced persons located in the Darfur region of Sudan with an estimated population of 20 000 to 30 000. The training targets local medical officers and physicians in the camp, with the goal of improving the quality of health services available to refugees. This report describes the development, implementation, and evaluation of the curriculum, and discusses its components, feasibility, and efficacy.

METHODS

Setting and Participants

In 2008, the camp's population had been living in this same displaced situation for 4 years. Security was lacking, and residents faced a constant threat of violence, shooting, and military offenses. Medical services, public health support, and food distribution were provided by international nongovernmental organizations (INGOs). The main medical facility of the camp was a field hospital and an ambulatory clinic.

Four local Sudanese physicians and 7 medical officers (with 4 years of medical training) who provided medical care in the camp participated in the comprehensive training program. Additional targeted training also was offered to 15 nurses and nurse aids and 30 CHWs working for 2 organizations providing health care and water and sanitation to the population. The majority of participants spoke the local language. Medical personnel in the camp had been receiving sporadic training for targeted diseases, mostly early in the

conflict. One physician had received comprehensive training in public health and data collection for performing and overseeing the health surveillance in the camp.

Structure, Development, and Implementation of Curriculum for Medical Officers and Physicians

Accounting for the limited time available for didactic teaching in a busy clinical schedule in this camp for internally displaced persons, we focused on 6 areas of "core competency" encompassing clinical topics, public health, psychosocial domains, and organizational skills: (1) epidemiology and critical analysis of public health data including morbidity and mortality evaluations; (2) clinical competency in a wide range of inpatient care settings for both acute and chronic diseases; (3) outpatient primary care for both acute and chronic diseases; (4) tropical medicine and infectious diseases including handling of highly contagious isolation cases; (5) clinical skills in psychiatric and psychosocial illnesses; and (6) reproductive and maternal health issues. Lists of relevant topics were generated for each area of competency, with associated learning objectives, and didactic curriculum and practice-based training methods were designed to address these objectives. Specific topics are presented in Table 1.

The competencies and topics were selected through several methods. A literature search was performed for existing curricula from global health programs in academic institutions and international NGOs¹⁸⁻²⁰; experts in the field of global health were consulted and extensive observations of patient encounters with the medical providers, nursing staff, and CHW in the camp were conducted. Also, informal discussions with practitioners were held to assess the educational needs of local health workers and determine the common pathologic conditions seen in the refugee population. The most frequent diagnoses during the past 12 months were reviewed, and the effect of seasonal differences was noted. The participating physicians also requested some topics not commonly seen in a refugee camp. Then a written examination was developed to assess the baseline level of

knowledge and skill and administered to the medical officers only. The core faculty providing the training had backgrounds in public health, academic inpatient and outpatient medicine, tropical medicine, and psychosocial medicine.

Multiple methods of teaching were designed to strengthen participants' understanding of the competencies from several aspects. The 8-week training consisted of a series of didactic sessions, practice-based learning in both inpatient and outpatient settings, and interactive case-based class discussions. Physicians also were asked to prepare morbidity and mortality reports and to investigate and discuss all mortality cases from the previous day after each didactic session. Reading materials available for study included medical books, educational computer discs, and *UpToDate*[®].

For practice-based learning, participants were asked to select for discussion both difficult and simple common diagnoses seen in their practice. A 90-minute educational session was conducted 4 times per week; it included 30 minutes of lecture, a 30-minute discussion of a specific relevant case, and a 30-minute interactive discussion of the topic, including prevention, diagnosis, and management. Physicians who managed the inpatient wards and emergency room in the field hospital participated in practice-based teaching rounds for all patients admitted to the hospital. For medical officers, the training instructor acted as preceptor and consultant in the outpatient unit. One of us (R.A.) performed the initial assessment, designed the curriculum, and conducted the teaching rounds and didactic sessions for physicians and medical officers.

Limited Training for Nurses and CHWs

During a 2-week period, the clinical encounters of the nurses and nurse aids were systematically observed, and an open discussion was held to determine their educational needs and barriers to effective nursing care. Then 60-minute didactic training sessions were conducted to target their educational needs, which mostly overlapped the topics covered in the physician training. Other topics included accurate measurement and recording of vital signs; medication verification, storage, and administration; patient safety; proper technique and interpretation of rapid diagnostic tests and on-site laboratory tests; patient feeding and bathing; fever management; infection control measures; and nursing strategies in the intensive care unit. The guiding principles of team work and learning through constructive feedback were emphasized. As members of a clinical care team, nurses and nurse aids received ongoing bedside training during medical rounds and participated in teaching rounds with physicians.

The CHW participants were offered 2 workshops and question-and-answer sessions, which covered clinical case detection, recognizing and understanding basic psychosocial issues, and a review of basic water and sanitation principles.

Evaluation of Curriculum

The quality and efficacy of the curriculum for medical officers and physicians were evaluated through several approaches, including a comparison of pretraining and posttraining tests for the medical officers, focus group discussions and evaluations during clinical rounds conducted during the training, and a written anonymous survey for the physicians.

A 31-item pretraining and posttraining tests were administered anonymously to all medical officers who participated in this curriculum. The tests consisted of multiple-choice and free-response questions, which aimed to assess participants' clinical knowledge of common outpatient illnesses that were emphasized in the training. The pretraining test that was administered and collected before training began was administered (minus 2 questions) again at the end of the 8-week training to evaluate the improvement in participants' knowledge during the training. Although the questions were virtually the same on both tests, the order of the questions was changed to minimize answers based on question memorization rather than clinical learning. We used a paired *t* test to compare and analyze the overall pretraining and posttraining test scores. The examination data were coded and analyzed using SPSS. Questions were grouped into subcategories, such as pediatric infectious disease, noncommunicable diseases, diagnostics, and treatment, and aggregate scores for questions were used to analyze responses accordingly. In addition, the medical officers' clinical practice was qualitatively observed daily to assess improvements in their skills.

The physicians were not evaluated with pretraining and posttraining tests owing to multiple factors, including the extensive nature of their training and their relatively small numbers. The emphasis was on building skills rather than improving knowledge and to avoid a teacher-student relationship. The focus instead was on peer-to-peer education, commitment to lifelong learning, and critical thinking of one's practice. At the end of the 8-week training, the physicians were asked to reflect on their own performance and satisfaction with the training and complete a survey evaluating different aspects of the training on a Likert scale, with 1 being the lowest and 5 the highest possible scores. The clinical skills of the physicians were qualitatively assessed through direct observation during teaching rounds in the wards, group discussion sessions, and individual oral presentations throughout the 8-week training. Special effort was made to continually provide feedback to practitioners during individual meetings and group discussions, emphasizing their strengths and elaborating on areas for improvement. We used a rough checklist incorporating groups of items, which included integrating relevant history and examination findings, critical analysis and differential diagnoses, developing a plan of care and managing clinical cases according to recommended guidelines, and patient outcomes. This approach was used as a gateway to provide additional focused training and improve learning.

TABLE 2

Pretraining and Posttraining Curriculum Written Examination Results			
Questions	Pretraining	Posttraining	<i>P</i> ^a (Paired <i>t</i> Test)
Overall			
Average score (SD)	15 (2.44)	23.143 (1.57)	<i>P</i> < .0001
Percent correct (SD)	.517 (.084)	.798 (.054)	
Diagnostic			
Average score (SD)	6.14/13 (2.61)	10.3/13 (1.38)	<i>P</i> < .05
Percent correct (SD)	0.473 (0.20)	0.791 (0.11)	
Pediatric Infectious Disease			
Average score (SD)	9.86/22 (2.12)	17.43/22 (1.51)	<i>P</i> < .001
Percent correct (SD)	0.448 (0.09)	0.792 (0.07)	
Adult Infectious Disease			
Average score (SD)	5.57/8 (1.13)	6.43/8 (0.79)	NS
Percent correct (SD)	0.696 (0.14)	0.804 (0.10)	
Sexually Transmitted Infections			
Average score (SD)	2.29/3 (0.49)	2.5/3 (0.53)	NS
Percent correct (SD)	0.762 (0.16)	0.833 (0.18)	
Treatment			
Average score (SD)	9.71/18 (1.70)	14.14/18 (1.21)	<i>P</i> < .001
Percent correct (SD)	0.540 (0.10)	0.786 (0.07)	

^a NS, not statistically significant at *P* < .05.

Due to logistical issues and lack of a rigorous curriculum, nurses, nurse aids, and CHWs were not systematically evaluated.

RESULTS

At baseline, 90% of participants described no previous trainings in refugee health, but most had diverse experience working with refugees previously. All physicians and all but 1 medical officer were men. The mean age of the physicians was 33 years; medical officers were generally older, from age 40 years to late 70 years.

Medical Officers

The results of pretraining and posttraining tests administered to medical officers are summarized in Table 2. The majority performed satisfactorily in the final posttraining examination, and ongoing qualitative observations in both inpatient and outpatient settings demonstrated improved service quality.

The responses to 29 questions were analyzed, because 2 questions from the pretraining test were not included in the posttraining test. The average overall score on the pretraining test was 15 of 29 (SD 2.44) or 0.52% (SD.084); the overall score for the posttraining test was 23 of 29 (SD 1.57) or 0.798% (SD.054), which was a statistically significant improvement (*P* < .0001) (Table 2). When questions were grouped by category, improvement was noted for all categories, including pediatric infectious diseases, adult infectious diseases, and noncommunicable diseases: 78% (*P* < .001), 30%, and 42% (*P* < .01), respectively. An analysis of questions in other subgroups, including sexually transmitted

infections and general diagnoses and treatment, are presented in Table 2.

Physicians

The mean number of years of experience for physicians was 7 years, and all had been out of school for at least 6 years. In the surveys, physicians on average reported an increase greater than 50% (CI 17%-82%; range, 25%-75%) in their baseline knowledge in management of presented topics. Survey questions are listed in Table 3. According to the physicians' evaluations, the most helpful training topics were clinical skills and public health, but public health was rated as least interesting. When asked to rate the improvement of their understanding of presented topics over the course of the training, physicians reported "good" improvement; the choices were 'significant', 'good', 'average', and 'poor'.

In open-ended survey questions, physicians revealed that they would have preferred more time to read materials and prepare in advance to better engage in discussions. Participants overwhelmingly thought that the case-based teaching rounds were the best of the teaching modules because they provided opportunities to address clinical issues as they arose. Most participants appreciated the complementary teaching methods (lecture-based learning, case-based teaching rounds, and morbidity and mortality discussions), but preferred lecture-based modules for public health aspects. They advocated for continuing the training on an ongoing basis.

Barriers to effective learning were revealed during focus group discussions. Participants cited barriers such as time constraints in a busy field hospital/clinic; lack of adequate laboratory and

TABLE 3

Curriculum Evaluation by Physicians (n = 4)

Likert Scale ^a	Rating
Diversity of topics	4.5
Overall quality of lectures	4.5
Presentation of topics	5
Usefulness of lectures	4.75
Quality of case-based morning teaching rounds	5
Welcoming discussion	4.25
Likelihood to recommend to colleagues	4.75

^a Five-point scale: 1 equals lowest score; 5 equals highest score.

ancillary support services, including microscopy and basic blood and metabolic panels; patient workload during epidemics; and minimal support for making training a priority. Remoteness of the refugee camp from their original place of residence, transportation difficulties, the volatile nature of the camp, and security issues in tense situations in Darfur were cited as potential barriers to continuing their work with refugees. Medical personnel were salaried employees and did not mention financial constraints as a potential barrier.

DISCUSSION

The limited data on training medical personnel in refugee situations focuses on programs that have a narrow scope and design, that concentrate on targeted diseases rather than taking a comprehensive approach, and that usually are not conducted on-site.^{13,14} Very few are capacity-building training initiatives in low-resource settings that fully address the wide range of health challenges that medical personnel in refugee humanitarian situations face on a daily basis. INGOs are often reluctant to provide comprehensive curricula largely due to the lack of resources such as funding and personnel, the lack of an institutional system or mandate in their mission for initiating and maintaining training programs, and other pressing priorities.⁶

We provided a comprehensive clinical and public health training for medical personnel working in a refugee setting that emphasized interactive learning among different levels of health professionals and was moderated and reinforced by minimal outside help.

Didactic components were structured with consideration to the trainees' educational background. For physicians, the focus was on critical thinking and clinical decision-making skills, including a brief overview of pathophysiology, systems-based thinking and practicing, practice-based learning in clinical medicine, and the management of public health challenges. For medical officers, nurses, nurse aides, and CHWs, a more knowledge-based building approach was used. The learning model for medical officers addressed their

knowledge to improve diagnostic and management skills, and it was well received. For both medical officers and physicians, the case-based discussion sessions emphasized diagnosis, management, and effective use of limited resources.

Practice-based learning was a crucial component of the program. It emphasized analytic learning, self-evaluation and improvement, and interactive discussions. It incorporated case-based learning during daily practice, followed by team discussions that addressed barriers to effective case management. Knowledge gained in these sessions was directly applied to subsequent patient encounters. Physicians appreciated this aspect of the training the most and found it a useful method of learning. They also appreciated the complementary teaching methods and advocated for continuing the training on an ongoing basis.

Another aspect of our program was to foster a culture of systematic learning in which all health personnel including nurses, nurse aids, CHWs, and water and sanitation staff participate in continuous learning to improve the overall standard of care. We attempted to promote a team approach both in learning and practice by including all nurses and nurse aids in bedside teaching rounds in spite of the historical hierarchy among health professionals.

The evaluation of the training showed a significant increase in knowledge and skill sets for medical officers in the management of diseases that are common in a refugee setting. The pretraining and posttraining tests overwhelmingly asked knowledge-based questions, especially concerning pediatric infectious diseases, because those are the most prevalent medical issues in refugee situations encountered by practitioners. However, during lecture-based training sessions a wide range of noninfectious and adult disease topics focusing on diagnoses and managements also were covered.

Although physicians were not administered the pretraining and posttraining tests, their survey responses indicated that the training had significantly increased their knowledge and skills from baseline. All participants rated the usefulness of the teaching and its relevance to their daily practice as "very good" to "excellent." From the perspective of the trainees, participating in the training was a way to invest in themselves by learning to practice medicine more effectively and develop expertise in the field. The training also helped them to satisfy their intellectual need in such a disheartening setting. Refreshing educational programs for health professionals in refugee settings are important for improving poor health indicators and for maximizing effective use of scarce resources.²¹ Ongoing training programs could help INGOs address the health of the population more effectively and improve the overall operational efficacy and the standard of care in a situation with limited resources and logistical constraints.⁶

Some fundamental challenges were the lack of priority of training, the perceived difficulties with implementing

ongoing training, and the automatic assumption that a refugee situation is by definition unstable and unable to support initiation and maintenance of an ongoing training program. The instability of a refugee setting is often argued as a barrier to implementing ongoing training programs for health workers. Undoubtedly, training would be more feasible in camps that are stable after an emergency. However, we believe that our program offers a minimal system that is always available for providers to evaluate patients and provide treatment; at minimum, they can systematically discuss and evaluate clinical scenarios, obtain immediate feedback, and put their learning into their daily practice. In addition, we observed that practice-based training is an integrative team effort. Therefore, the participation of an outsider to maintain the training process is ideal but not crucial. In our experience, medical professionals can discuss clinical cases with each other, use references on a regular basis, and, if needed, obtain episodic consultation for more comprehensive training.

Several other logistical challenges to implementing this type of training included the scheduling of trainers and trainees to allow participation. In spite of the cooperation of INGO staff, ensuring protected time for training participation originally appeared to be an ongoing challenge that required creative planning and continual reassessment of program structure. Furthermore, physicians and medical officers were concerned that the large patient load would not allow them to take time to study or prepare. With further clarification and reinforcement of their attendance, they found that it was possible to spare time and participate in the classes, and that investing time in training and improving the quality and standard of medical care would subsequently improve their patient load more effectively.

The development of the curriculum was also a work in progress, and its structure was slightly revised to ensure that important practical skills were introduced earlier in the program to better facilitate attendance and improve the utility of the educational modules. These changes allowed the participants extra time to prepare and participate and allowed consolidation of teaching activities.

Additional challenges included finding a quiet classroom for training sessions and dealing with multiple interruptions during sessions when urgent matters arose for which no alternative coverage was available. We found that the persistence and dedication of the trainees were important factors in moving forward in spite of these logistical issues and that reinforcing the importance and priority of the training activities to other support staff helped to provide better understanding and support for the initiative. Also a challenge was the lack of basic technical resources including laboratory equipment. In addition to efforts spent in obtaining laboratory support to balance the lack of confirmatory laboratory tests, we focused as well on improving clinical decision-making and critical thinking using epidemiology,

pertinent history, and sound physical examination, and observations of the patient's response to treatment and actual process of recovery.

Limitations

Our study has several limitations, including the small sample size of physicians and medical officers, inherent limitations in measuring potentially sustained impact on knowledge and skills of the participants, and a lack of objective assessment of skills and practices for all participants. The anonymous surveys collected self-reported data and feedback from physicians, which increase the possibility of socially desirable responses regarding the nature and effect of the training. Although we evaluated all medical officers with pretraining and posttraining tests 8 weeks apart with a mixed order of questions, a more rigorous testing technique was not applied to eliminate the effect of the examination itself in improving posttest responses. This latter approach could have affected the accurate measurement of improved knowledge. Moreover, we were not able to evaluate satisfaction among the refugees as recipients of care, nor we were able to objectively measure mortality and morbidity among refugees due to the short period of exposure to show that the potential increase in knowledge and or improved skills of participants translated into better care.

Although the conclusions drawn from the preliminary data are restricted by these limitations, the improvement in morale and confidence and in actual case management during ongoing clinical observation was extraordinary. A longitudinal outcome study is needed to show the impact of the program on the primary teaching outcomes in trainees and the secondary health care outcomes in the population, and to further adjust the educational module for training providers. We recognize the time and financial constraints of participants and INGOs, the lack of human resources in general, and the issues of sustainability, but believe that the implementation and evaluation of our training curriculum for local medical practitioners demonstrated the importance, feasibility, and efficacy of on-site trainings with didactic and practice-based sessions and case-based teaching. Ongoing monitoring and evaluation of the program and interaction with other health training programs will help to refine and strengthen the program to best meet the needs of the participants and the communities they ultimately serve.

We found that it was feasible to implement a long-term ongoing training program that is initiated by outsiders but becomes integrated into horizontal peer-to-peer and practice-based learning. This program could provide a forum that is adequate in both time and exposure to help polish medical skills and to evaluate its efficacy but is not too exhaustive and burdensome for aid agency personnel. Our training module shares basic features with many targeted programs by INGOs¹⁸ but features diversity in its teaching approach with complementary learning methods and emphasizes practice and system-based learning and all-inclusive training.

CONCLUSIONS

We recommend making ongoing on-site training for medical personnel a priority in refugee settings to provide quality medical and public health services and to ensure effective utilization of resources.²² The feasibility and efficacy of training is essential to convince INGOs and medical personnel that implementing an on-site health worker training is not automatically impractical due to perceived time constraints or the volatility of refugee settings. In addition, implementing all-inclusive training for all levels of health professionals involved in patient care reinforces teamwork and improves morale, confidence, and provider efficiencies. It is also important to use multiple methods of teaching, with an emphasis on practice and system-based learning, to ensure consistency and to complete gaps in knowledge and skills, to use local human resources, and to emphasize peer-to-peer education in a protected forum. The curriculum needs to be comprehensive, to include a wide range of topics both in medical and public health aspects, and to focus on improving clinical decision-making process and critical thinking using epidemiology, pertinent history, and sound physical examination to counterbalance limitations of ancillary services.

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REFERENCES

- Toole MJ, Waldman RJ. Refugees and displaced persons. War, hunger, and public health. *JAMA*. 1993;270(5):600-605.
- Kalipeni E, Oppong J. The refugee crisis in Africa and implications for health and disease: a political ecology approach. *Soc Sci Med*. 1998;46(12):1637-1653.

- Blogg J. Evaluation of quality, access to and use of reproductive health services for refugees and internally displaced person. In: *Inter-agency Global Evaluation of Reproductive Health Services for Refugees and Internally Displaced Persons*. Kensington, Australia: University of New South Wales, School of Public Health and Community Medicine 2004;82:102-117.
- Machlis GE. *Warfare Ecology: A New Synthesis for Peace and Security*. New York: Springer; 2011.
- Anderson P. Long term displacement raises new health needs. *BMJ*. 1999;318(7190):1029.
- Toole MJ, Waldman RJ. The public health aspects of complex emergencies and refugee situations. *Annu Rev Public Health*. 1997;18:283-312.
- Siddique AK, Salam A, Islam MS, et al. Why treatment centres failed to prevent cholera deaths among Rwandan refugees in Goma, Zaire. *Lancet*. 1995;345(8946):359-361.
- Adler D, Mgalula K, Price D, Taylor O. Introduction of a portable ultrasound unit into the health services of the Lugufu refugee camp, Kigoma District, Tanzania. *Int J Emerg Med*. 2008;1(4):261-266.
- Kim G, Torbay R, Lawry L. Basic health, women's health, and mental health among internally displaced persons in Nyala Province, South Darfur, Sudan. *Am J Public Health*. 2007;97(2):353-361.
- Ecker N. Where there is no village: teaching about sexuality in crisis situations. *SIECUS Rep*. 1998;26(5):7-10.
- Mullany LC, Lee CI, Paw P, et al. The MOM Project: delivering maternal health services among internally displaced populations in eastern Burma. *Reprod Health Matters*. 2008;16(31):44-56.
- Mullany LC, Lee TJ, Yone L, et al. Impact of community-based maternal health workers on coverage of essential maternal health interventions among internally displaced communities in eastern Burma: the MOM project. *PLoS Med*. 2010;7(8):e1000317.
- Palmer CA, Lush L, Zwi AB. The emerging international policy agenda for reproductive health services in conflict settings. *Soc Sci Med*. 1999;49(12):1689-1703.
- Muecke MA. New paradigms for refugee health problems. *Soc Sci Med*. 1992;35(4):515-523.
- Chandler CI, Chonya S, Boniface G, Juma K, Reyburn H, Whitty CJ. The importance of context in malaria diagnosis and treatment decisions - a quantitative analysis of observed clinical encounters in Tanzania. *Trop Med Int Health*. 2008;13(9):1131-1142.
- Goma Epidemiology Group. Public health impact of Rwandan refugee crisis: what happened in Goma, Zaire, in July, 1994? *Lancet*. 1995;345(8946):339-344.
- Hakewill PA. Doctoring beyond frontiers. *Med J Aust*. 1997;167(11-12):618-621.
- Abbatt FR, World Health Organization. *Teaching for Better Learning: A Guide for Teachers of Primary Health Care Staff*, 2nd ed. Geneva: World Health Organization 1992;190.
- Drain PK, Primack A, Hunt DD, Fawzi WW, Holmes KK, Gardner P. Global health in medical education: a call for more training and opportunities. *Acad Med*. 2007;82(3):226-230.
- Hall T. *Teaching Modules*; 2010. San Francisco, CA: Global Health Education Consortium website. <http://www.globalhealtheducation.org/>. Accessed June 2011.
- Hanquet G, ed. *Refugee Health: An Approach to Emergency Situations*. Oxford, UK: Macmillan Education; 1997.
- Zerrouki A, Gagnayre R, Biberson P. Education of health personnel in the design of humanitarian actions: the experiences of a non-governmental organization [in French]. *Sante Publique*. 2000;12(3):355-362.