

ORIGINAL RESEARCH PAPER

## **A Survey Validation of Generic Objectives for Community-Based Education in Undergraduate Medical Training**

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**ABSTRACT** **Introduction:** *A framework for the definition of generic objectives for community-based education (CBE) was developed for undergraduate medical programmes, particularly for developing countries. To probe the validity of the set of CBE objectives generated by this approach, opinions from a wider audience were sought.*

**Method:** *Questionnaires were sent to 72 medical schools in 36 developing countries. Half of the addressees were randomly drawn from the list of institutional members of The Network: Toward Unity For Health (TUFH) and stratified according to developing countries. Another 36 medical schools were randomly drawn from non-Network: TUFH schools from the same country where the selected Network: TUFH addressee was located, or from a neighbouring country.*

**Results:** *A total of 43 medical schools responded to the questionnaire (60% response rate), 31 out of the 36 addressed Network: TUFH members (86%) and 12 out of 36 addressed non-Network: TUFH schools (33%). Out of all 43 respondents 39 (91%) had implemented CBE in their curricula. Opinions of Network: TUFH and non-Network: TUFH schools on the framework and the generic objectives were not significantly different. Out of the 21 proposed objectives, 17 were scored as relevant by 75% or over of all responders and one out of the four objectives considered to be less relevant by the responders was deleted.*

**Conclusion:** *A framework to develop generic CBE objectives and a derived set of 21 objectives were modified based on input by 43 medical schools residing in developing countries distributed all over the globe. The outcome is a validated set of 20 generic objectives for CBE programmes in developing countries.*

**KEYWORDS** *CBE, objectives, undergraduate, validation.*

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## Introduction

Community-based education (CBE) refers to learning activities (e.g. of medical students) that use the community extensively as a learning environment (World Health Organization, 1987). In curricula featuring CBE, students become acquainted with community health issues early because study periods for practical work in community settings are included in their programmes (Feletti *et al.*, 2000). Departing from priority health problems jointly identified by community members and students, the latter are encouraged to co-operate with the community to solve these problems and to evaluate the outcomes of their interventions (Schmidt *et al.*, 1991). Medical schools have implemented CBE programmes for various purposes, some examples are as follows: enable students to experience the health needs of society and the potentials of community-based organizations (Lennox, 1998); introduce students to the full spectrum of health care (Seabrook *et al.*, 1999); advocate public health approaches in assessing the health needs of community (Dowell *et al.*, 2001); and meet health needs of the nation at community and hospital levels (Omotara *et al.*, 2004). The availability of generic objectives for CBE programmes would assist medical schools with the design of these programmes. Such a set of generic CBE objectives could be used to compare with a school's own CBE objectives that is, to check whether the most important aspects were covered.

Based on a literature review, a framework was developed for the definition of generic CBE objectives for undergraduate medical programmes, particularly for developing countries. The framework illustrates the steps taken to develop objectives for CBE departing from factors impacting on community health as perceived by the community; identifying tasks for the students to improve inadequate conditions; defining the competencies required to execute those tasks; and eventually designing educational objectives to develop those competencies. This framework was validated by an international panel of experts involved in CBE (Kristina *et al.*, 2004). However, to examine the wider acceptability of the generic objectives derived from this framework, opinions from a larger audience were needed. Therefore, the aim of this study was to collect and analyse opinions of medical schools in developing countries on the framework and the derived objectives. The outcomes of this survey will add to the validation of the preliminary set of generic CBE objectives as presented by Kristina *et al.* (2004).

## Methods

Purposive sampling was used to select medical schools in developing countries likely to have implemented CBE programmes (Patton, 1990) and developing countries were defined according to World Bank criteria (World Bank, 2004). Although Bahrain and Israel belong to the high income countries, they were

included because participating medical schools from these countries featured CBE programmes comparable to those in developing countries (Hamdy *et al.*, 1991; Margolis, 2000). Thirty-six medical schools residing in 36 different countries were randomly chosen from the list of institutional members of The Network: Towards Unity For Health (TUFH) and were stratified according to developing countries. It was assumed that The Network: TUFH member schools would have integrated CBE in their medical curricula, because one of the goals of The Network: TUFH is to encourage its member institutions to adopt CBE (Richards, 2003; Kaufman *et al.*, 2004). To avoid convenience and judgemental sampling bias, a risk due to the fact that one of us (GDM) was a Network: TUFH board member when this study was executed, for each Network: TUFH member school a non-Network: TUFH school from the same country was randomly selected from the World Directory of Medical Schools (WHO, 2000). If no non-Network: TUFH school was available in the same country, a non-Network: TUFH school was selected from a neighbouring country with a similar number of physicians per 100,000 inhabitants (WHO, 2000).

Questionnaires were mailed to a total of 72 medical schools with an offer to raffle 20 copies of a book (i.e. Schmidt *et al.*, 2000) to those who responded to the questionnaire. The questionnaire presented a provisional list of 21 generic CBE objectives with the following three themes: (1) solving health problems in collaboration with the community; (2) providing health education to the community; and (3) reducing inequity in access to health services (Kristina *et al.*, 2004). In an accompanying letter, the purpose of the study and the steps taken in the framework to arrive at generic CBE objectives were explained. Respondents were invited to state their opinion on each individual CBE objective and on the elements in the framework used to arrive at that objective. Respondents were asked to score their opinions on a five-point Likert scale (1 = irrelevant; 2 = somewhat irrelevant; 3 = neutral; 4 = relevant; 5 = highly relevant). Separate space was provided for additional comments.

### *Data Analysis*

Quantitative data were analysed with SPSS software, version 10. Cronbach's alpha was calculated to measure internal consistency of items in the questionnaire (Bland, 1997; Streiner & Norman, 2003). A minimum percentage of 75% was set for general agreement on any particular item (Tigelaar *et al.*, 2004). For this and some other calculations, the scores 1 and 2 on the Likert scale were combined to represent "irrelevant", score 3 was preserved as "neutral", and scores 4 and 5 were combined to represent "relevant". Thus, in this study an item was accepted as relevant when 75% of the respondents rated this item with a score 4 or 5. Chi-square test was used to analyse differences between opinions of Network: TUFH members and non-Network schools. Students' *t*-test was used for comparison of the mean time spans devoted to CBE in Network: TUFH and non-Network: TUFH schools.

Respondents' additional comments were analysed by coding comparable comments expressed by two or more respondents as key points, then the key points were organized into categories to develop the themes (Silverman, 2001). To consider changes in the provisional set of generic CBE objectives, respondents' key points were used and subsequently checked for each suggestion, as to whether they were supported (or at least not contradicted) by the quantitative data (Oppenheim, 1966). Conversely, objectives that did not meet the 75% relevant score in the quantitative data were reviewed by checking whether these objectives received positive comments from respondents. Lastly, suggestions to change the wording of, or to add some words to any CBE objective, were adopted when the suggestion seemed to be worthwhile and did not alter the essence of the particular objective.

## Results

The internal consistency of the questionnaire was satisfactory (Cronbach's alpha for 6 items on "solving community health problems": 0.81; Cronbach's alpha for 7 items on "providing health education to the community": 0.73; and Cronbach's alpha for 8 items on "reducing inequity in access to health services": 0.85).

In total, 43 medical schools out of 72 responded to the questionnaire (60% response rate), 31 out of 36 addressed Network: TUFH members responded (86%) and 12 out of 36 non-Network schools responded (33%). There were 2.3% missing data on 10 items in the questionnaire, 4.6% on another 5 items, 6.9% on another 2 items and 9.3% on another 2 items.

Most respondents (93% of Network: TUFH members and 83% of non-Network schools) had implemented CBE programmes with durations ranging from 3–120 weeks. The mean number of CBE weeks implemented by Network: TUFH member schools was 30.2 (standard error of the mean, SEM = 4.9), and 10.6 for non-Network: TUFH schools (SEM = 3.5;  $p = 0.002$ ). No significant differences were detected in the appreciation of the framework and the generic CBE objectives between Network: TUFH and non-Network: TUFH schools. Therefore, data from Network: TUFH and non-Network: TUFH schools were pooled to assess the overall perceived relevance of the framework and the generic CBE objectives (Table 1). Apart from one "neutral" score, all respondents perceived the framework used to develop generic CBE objectives as relevant. The following four CBE objectives were scored as relevant by less than 75% of the pooled respondents: Graduates (1) have knowledge on occupational health; (2) are able to monitor effectiveness and efficiency of community health services; (3) are able to invent realistic strategies to improve community access to health services and (4) are able to manage a primary care unit and to sustain health administration.

The five themes that emerged from the respondents' comments were as follows: (1) emphasize partnerships and intersectoral collaboration; (2) add

**Table 1.** Pooled respondents' opinions on the proposed generic CBE objectives (scored on a 5-point Likert scale)

Items	1 (Irrelevant; %)	2 (Somewhat irrelevant; %)	3 (Neutral; %)	4 (Relevant; %)	5 (Highly relevant; %)	'Relevant' (scale values 4 and 5; %)
The framework to develop CBE objectives (see Kristina <i>et al.</i> , 2004)			2.5	43.6	53.9	97.5
<i>In collaboration with the community, graduates are able to:</i>						
1. identify health problems related to the given circumstances			2.3	27.9	69.8	97.7
2. determine incidence and prevalence of disease in the community			13.9	25.6	60.5	86.1
3. invent realistic solutions for identified health problems			4.6	51.2	44.2	95.4
4. collaborate with professionals from other disciplines and other related sectors to solve identified health problems		2.4	11.9	40.5	45.2	85.7
5. mobilise the community for health interventions			14.3	45.2	40.5	85.7
6. design and implement a health intervention, and analyse the Results			9.5	45.2	45.2	90.4
<i>To give health education to the community, graduates:</i>						
7. have knowledge on adequate nutrition		2.4	14.3	33.3	50.0	83.3
8. have knowledge on lifestyle-related health risks in the community			2.4	26.2	71.4	97.6

(continued overleaf)

Table 1. (Continued)

Items	1 (Irrelevant; %)	2 (Somewhat irrelevant; %)	3 (Neutral; %)	4 (Relevant; %)	5 (Highly relevant; %)	'Relevant' (scale values 4 and 5; %)
9. have knowledge on environment-related health risks			9.5	19.0	71.5	90.5
10. have knowledge on occupational health		9.5	16.7	40.5	33.3	73.8
11. are able to design and transmit health education sessions		4.7	7.1	23.8	64.4	88.2
12. are able to train community health workers in health education		9.5	14.3	19.0	57.2	76.2
13. are able to evaluate the effectiveness of health education		9.5	14.3	40.5	35.7	76.2
<i>To reduce inequity of access to health services, graduates are able to:</i>						
14. assess availability of health services to the community		2.4	7.3	26.8	63.5	90.3
15. identify barriers to health care utilisation by the community			9.8	24.4	65.9	90.3
16. monitor effectiveness and efficiency of community health services		9.7	21.9	34.2	34.2	68.4
17. invent realistic strategies to improve community access to health services		4.9	24.4	36.5	34.2	70.7
18. work in a variety of community health care settings and to provide preventive, primary curative, and emergency care			7.3	22.0	70.7	92.7
19. manage a primary care unit and to sustain health administration	5.0	5.0	27.5	22.5	40.0	62.5
20. judge which patients need to be referred		2.5	10.0	15.0	72.5	87.5
21. participate in health teams			5.2	10.3	84.5	94.8

specified CBE objectives to the proposed list; (3) positive comments on proposed CBE objectives; (4) criticism on proposed CBE objectives, and (5) objectives on which opinions diverged among respondents (Table 2). No striking differences between responses by Network: TUFH member schools and non-member schools were observed. Furthermore, some respondents suggested additions and changes in the wording of certain objectives.

### *Digestion of Suggestions Regarding the Preliminary List of Generic CBE Objectives*

Suggestions to more explicitly insert the concepts of “partnership between university, local government and community” and “intersectoral collaboration to mobilise the community for health interventions” were not adopted. Collaboration of students (representing university) and community is covered by objectives 1–6; collaboration with local government by objectives 14–20 (for numbered objectives see Table 3). Intersectoral collaboration is explicitly mentioned in objective 4.

Respondents’ suggestion to add “Graduates are able to select appropriate teaching aids/media” was not adopted as this skill was considered implicit in the competence addressed by objective 11.

Five objectives were considered too ambitious for undergraduate training of medical students. Three out of these five objectives (i.e. graduates are able to monitor effectiveness and efficiency of community health services to invent realistic strategies to improve community access to health services and to manage a primary care unit to sustain health administration) were scored as relevant by less than 75% of the pooled respondents. The latter objective was also frequently criticized in the additional comments. Based on the qualitative and quantitative data, the objective pertaining to managing a primary care unit and sustaining health administration was deleted. It was decided not to delete the former two objectives since some respondents also made positive comments about those objectives (Table 2).

The essence of the suggestion to add “Graduates: understand government health policy” was adopted. Therefore, objective 4 was expanded by adding “with consideration of government health policy”. The suggestion to include “Graduates: empower the community” was adopted in the framework used to derive generic CBE objectives. The issue was inserted on top of the column specifying “Potential assistance from students” rather than adding it as a separate objective. The essence of the suggestion to add “Graduates: have knowledge on socio-cultural conditions related to health” was inserted in objective 2. “Community awareness about existing health services” was added by changing objective 15, “Graduates: are able to identify barriers to health care utilisation by the community” to “Graduates: are able to determine health care utilisation by the community and community attitude to available health services”.

Objective 10: “Graduates have knowledge on occupational health” was retained, although scored as relevant by only 73.8% of the respondents,

**Table 2.** Issues raised by respondents

Themes*	Key points
Partnership and intersectoral collaboration	Insert the concepts of university partnership with community and local government, and intersectoral collaboration
Add CBE objectives	<p>Graduates:</p> <ul style="list-style-type: none"> <li>understand government health policy</li> <li>empower the community</li> <li>have knowledge on socio-cultural conditions related to health</li> <li>are able to select appropriate teaching aids/media</li> <li>promote community awareness about existing health services</li> </ul>
<i>Positive comments on CBE objectives</i>	
Graduates:	
are able to identify health problems related to the given circumstances	Through interaction with the community
are able to mobilise the community for health interventions	In collaboration with community leaders, social workers
have knowledge on environment and lifestyle-related health risks in the community	As an essential component of CBE
have knowledge on occupational health	Also learned during CBE
are able to identify barriers to health care utilisation by the community	Through interaction with the community
are able to judge which patients need to be referred	In collaboration with health staff

(continued overleaf)

Table 2. (Continued)

Themes*	Key points
<i>Criticism on CBE objectives</i> Graduates are able to determine incidence and prevalence of disease in the community Graduates are able to train health workers in health education Graduates are able to manage a primary care unit and to sustain health administration	Meaning of incidence and prevalence more important than determination Too ambitious for undergraduates Too ambitious for undergraduates
<i>Divergent opinions on CBE objectives</i> Graduates are able to evaluate the effectiveness of health education Graduates are able to monitor effectiveness and efficiency of community health services Graduates are able to invent realistic strategies to improve community access to health services	<i>Negative views:</i> Too ambitious for undergraduates Too ambitious for undergraduates Too ambitious for undergraduates <i>Positive views:</i> Has been implemented (evaluative phase) Has been implemented (postings in PHC centres and district hospitals) Has been implemented (by follow up of patients and postings in district hospitals)

\*Themes were coined if two or more respondents made similar comments.

**Table 3.** Perceived community health needs, potential assistance from students, competencies required in students to deliver assistance, and associated objectives for CBE programmes: validated version of the framework presented in Kristina *et al.*, 2004

Perceived community health needs	Potential assistance from students	Associated competencies in students	Objectives for CBE programmes
Community actively participates in:	Community mobilisation: empowerment of the community to improve inadequate conditions	Training: Cognitive: Community assessment (3)*	In co-operation with the community, graduates are able to: <ul style="list-style-type: none"> <li>• identify health problems related to the given circumstances</li> <li>• determine incidence and prevalence of disease in the community and to appreciate the complex interplay between psychological, socio-cultural, and environment factors that impact on health and illness</li> </ul>
Identifying factors impacting on health:	Tasks: Working together with the community to identify inadequate conditions	Affective: Community supportive attitude (3)	<ul style="list-style-type: none"> <li>• develop realistic solutions to community-identified health problems and to solicit community's participation in that process</li> </ul>
Quality and availability of drinking water	Selecting optimal solutions with the community.	Skills: Problem solving (3) Communication (3) Team work (3)	<ul style="list-style-type: none"> <li>• collaborate with professionals from other disciplines and other related sectors to solve identified health problems with consideration of government health policy</li> </ul>
Safe sanitation and healthy housing	Working together with the community to implement selected solutions	Services: Implementing health interventions (3)	<ul style="list-style-type: none"> <li>• mobilise the community for health interventions</li> </ul>
Adequate nutrition	Working together with the community to assess the impact of the intervention	Research: Investigation of the effectiveness of health interventions (3)	<ul style="list-style-type: none"> <li>• design and implement a health intervention, and analyse results</li> </ul>
Rewarding daily activities			
Choosing and implementing health interventions			
Assessing the outcome of interventions			

(continued overleaf)

**Table 3. (Continued)**

Perceived community health needs	Potential assistance from students	Associated competencies in students	Objectives for CBE programmes
<p>Community identifies needs for education about health risks:                      Environmental                      Life style-related                      Occupational</p>	<p>Providing health education to the community</p> <p>Tasks:                      Organising health education sessions on environmental, life style, and occupation-related health risks based on the felt needs of the community</p> <p>Working together with the community to assess the impact of health education</p>	<p>Training:</p> <p>Cognitive:                      Knowledge on adequate nutrition (2)*                      Knowledge on environmental and life style-related health risks (2)                      Knowledge on occupational health (2)</p> <p>Affective:                      Awareness of the intellectual capacity of a community (3)</p> <p>Skills:                      Co-operation with existing public health services (3)                      Providing health education (3)</p> <p>Services: Providing health education (3)</p> <p>Research:                      Investigation into the effectiveness of health education (3)</p>	<p>To provide health education to the community, graduates must have knowledge of:</p> <ul style="list-style-type: none"> <li>• adequate nutrition</li> <li>• life style-related health risks in the community (e.g. smoking, alcohol and drug abuse, promiscuity, lack of physical activities)</li> <li>• environment-related health risks (e.g. contagious diseases, water and vector borne diseases, pollution)</li> <li>• occupational health, and be able to:                             <ul style="list-style-type: none"> <li>• design and transmit health education sessions</li> <li>• train community health workers in health education</li> <li>• evaluate the effectiveness of health education</li> </ul> </li> </ul>

(continued overleaf)

**Table 3. (Continued)**

Perceived community health needs	Potential assistance from students	Associated competencies in students	Objectives for CBE programmes
Community assesses its access to health services	<p>Reducing inequity in access to health services</p> <p>Tasks: Assessing access to health services</p> <p>Developing approaches for improvement</p> <p>Assisting the community to implement selected solutions</p> <p>Assessing the impact of the intervention</p>	<p>Training:</p> <p>Cognitive: Knowledge on primary health care and referral systems (2)*</p> <p>Affective: Awareness of barriers in a community preventing utilisation of health facilities (3)</p> <p>Skills: Basic clinical skills and emergency care (3)</p> <p>Project and facility management (2)</p> <p>Teamwork/Co-operation with existing public health services (3)</p>	<p>To reduce inequity in access to health services, graduates are able to:</p> <ul style="list-style-type: none"> <li>● assess availability of health services to the community</li> <li>● determine health care utilisation by the community and community attitude to available health services</li> <li>● observe and workable solutions to the effectiveness and efficiency of community health services</li> <li>● design realistic strategies to improve community access to health services</li> <li>● work in a variety of community health care settings (e.g. primary health care centres, district hospitals, maternal and child care units) and to provide preventive, primary curative, and emergency care.</li> </ul>

*(continued overleaf)*

**Table 3. (Continued)**

Perceived community health needs	Potential assistance from students	Associated competencies in students	Objectives for CBE programmes
		<p>Services: Providing primary and emergency care (3)</p> <p>Research: Investigation into access to the health services (3)</p>	<ul style="list-style-type: none"> <li>• judge which patients need to be referred</li> <li>• participate in health teams (e.g. with nurses, midwives, community health workers)</li> </ul>

\*Example of a desired competency level (based on Miller, 1990):

- (1): Knows (factual recall of knowledge).
- (2): Knows how (the application of knowledge to problem solving and decision making).
- (3): Shows how (the student has performed the skill at least several times).
- (4): Does (actual performance).

because of the positive comments from three respondents on this objective with no negative comments.

Finally, the wording of some objectives was altered according to suggestions by the respondents. Some examples are as follows: adding “and to solicit the community’s effort to develop solutions” to objective 3, “Graduates are able to design realistic solutions for identified health problems” and changing “invent” used in objective 17 to “design”. The procedure described above yielded a validated framework (as presented by Kristina *et al.*, 2004) and developed a list of generic objectives for CBE (Table 3).

## Discussion

To ensure that medical schools participating in this survey had included CBE programmes in their curricula a purposive sample was drawn from Network: TUFH member schools residing in developing countries. For comparison, a sample from non-Network: TUFH schools was drawn from countries corresponding to those where the Network: TUFH schools were based (or from a neighbouring country if not available in the country itself). Of the one-third of these non-Network: TUFH schools who responded to the questionnaire, 83% had included CBE programmes in their medical curricula. However, on average Network: TUFH member schools devoted significantly more time to CBE non-member schools. We are not aware of inclusion of CBE programmes in the 24 non-responding, non-member schools but assume at least some of them have CBE programmes in their curricula. This would be an interesting topic for further investigation.

The low response rate among non-Network: TUFH schools may be explained by lack of personal acquaintance with the authors, absence of CBE in their curricula and a lack of interest in the offered incentive (a book on CBE). Opinions of responding non-Network: TUFH schools about the proposed generic CBE objectives were not statistically different from those of Network: TUFH schools which allowed for a pooling of data from both groups of respondents to assess the perceived relevance of the framework and the derived CBE objectives.

Apart from one “neutral” score, 42 pooled respondents confirmed the relevance of the framework designed to derive generic CBE objectives. Four proposed objectives did not receive the pre-set 75% “relevant” score. Based on quantitative and qualitative data, one of these objectives (pertaining to managing a primary care unit and sustaining health administration) had to be deleted from the proposed set of generic CBE objectives. In the past, individual schools (Suez Canal University, Egypt; University of Hawai, USA) had decided to address this objective in their CBE programmes (Feletti *et al.*, 2000). The present decision to maintain the other three objectives was based on the fact that some respondents added positive comments about each of these objectives.

For this decision there is further support in the literature. With respect to the objective, “Graduates are able to monitor effectiveness and efficiency of community health services”, Hamilton (2000) stated that both postgraduate and undergraduate health profession students need to understand each profession’s contribution to patient safety and quality of care. In his view, students will only understand and learn how to respond to the inefficiency of community health services by being in the community and studying its health services. In relation to the objective, “Graduates are able to invent realistic strategies to improve community access to health services”, Dowell *et al.* (2001) recommended the inclusion of opportunities for improving the health care of the communities as part of students’ task in undergraduate CBE programmes. With respect to the objective, “Graduates have knowledge on occupational health” the Eighth Joint ILO/WHO Report (1981) stated that special effort should be made to include occupational health and safety in basic medical courses. Furthermore, occupational health has been described as being part of some CBE programmes for medical undergraduates (Feletti *et al.*, 2000; Musal *et al.*, 2003).

For the objective, “Graduates are able to determine prevalence and incidence of diseases in the community” the suggestion was made to add “have knowledge on socio-cultural conditions related to health”. Based on this suggestion and recent literature this objective was expanded to include “and to appreciate the complex interplay between psychological, socio-cultural and environmental factors that impact on health and illness” (Chin *et al.*, 2000; Satterfield *et al.*, 2004; Shaw & Mackinnon, 2004).

The quite low overall response rate to the questionnaire (60%) limits generalizing the results from this study. Preferably the validity of the framework and the derived generic CBE objectives should be enhanced by application in a variety of conditions. For example, the preliminary set of generic CBE objectives were recently used as a reference to evaluate an existing CBE programme in a medical curriculum (Kristina *et al.*, 2005; Kristina *et al.*, 2006a) and to design a modified version of the same programme (Kristina *et al.*, 2006b).

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## References

- BLAND, J.M. (1997). Statistical notes: Cronbach's alpha. *British Medical Journal*, 314, 572.
- CHIN, N.P., MONROE, A. & FISCELLA, K. (2000). Social determinants of (un)healthy behaviours. *Education for Health*, 13, 317–328.
- DOWELL, A., CRAMPTON, P. & PARKIN, C. (2001). The first sunrise: An experience of cultural immersion and community health needs assessment by undergraduate medical students in New Zealand. *Medical Education*, 35, 242–249.
- FELETTI, G., JA'AFAR, R., JOSEPH, A., MAGZOUB, M., MCHARNEY-BROWN, C., OMONISI, K., REFAAT, A., WACHS, J. & SCHMIDT, H. (2000). Implementation of community-based curricula. In H. SCHMIDT, M. MAGZOUB, G. FELETTI, Z. NOOMAN & P. VLUGGEN (Eds), *Handbook of Community-Based Education: Theory and Practices* (pp. 147–199). Maastricht: Network Publications.
- HAMDY, H., MOUSAWI, F., AMEEN, S. & WAHAB, A. (1991). Performances on the Bahrain licensure examination by graduates from two types of curricula. *Academic Medicine*, 66, 629–630.
- HAMILTON, J.D. (2000). The quality of Australian health care study: Implications for education of failure in quality and safety of health care. *Education for Health*, 13, 27–36.
- ILO/WHO (1981). Eighth Report of the Joint ILO/WHO Committee on Occupational Health: *Education and training in occupation health, safety and ergonomics*. Geneva: World Health Organization.
- KAUFMAN, A., VAN DALEN, J., MAJOOR, G. & MORA CARRASCO, F. (2004). The Network: Towards Unity For Health – 25th anniversary. *Medical Education*, 38, 1212–1218.

- KRISTINA, T.N., MAJOR, G.D. & VAN DER VLEUTEN, C.P.M. (2004). Defining generic objectives for community-based education in undergraduate medical programmes. *Medical Education*, 38, 510–521.
- KRISTINA, T.N., MAJOR, G.D. & VAN DER VLEUTEN, C.P.M. (2005). Does CBE come close to what it should be? A case study from the developing world evaluating a programme in action against objectives on paper. *Education for Health*, 18, 194–208.
- KRISTINA, T.N., MAJOR, G.D. & VAN DER VLEUTEN, C.P.M. (2006a). Does CBE come close to what it should be? A case study from the developing world. Students' opinions. *Education for Health*, 19, 179–188.
- KRISTINA, T.N., MAJOR, G.D. & VAN DER VLEUTEN, C.P.M. (2006b). Comparison of a community-based education programme executed with and without active community involvement. *Medical Education*, 40, (in press).
- LENNOX, A. (1998). Development and evaluation of a community-based, multi-agency course for medical students: descriptive survey. *British Medical Journal*, 316, 596–599.
- MARGOLIS, C.Z. (2000). Community-based medical education. *Medical Teacher*, 22, 482–484.
- MILLER, G.E. (1990). The assessment of clinical skills, competence and performance. *Academic Medicine*, 65, 563–567.
- MUSAL, B., AKSAKOGLU, G. & UCKU, R. (2003). Community-based education programme of Doküz Eylül School of Medicine. *Education for Health*, 16, 218–221.
- OMOTARA, B.A., PADONU, M.O. & YAHYA, S.J. (2004). Assessment of the impact of community-based medical education of the University of Maiduguri on communities in three local government areas of Borno State, Nigeria: Community leaders' perspectives. *Education for Health*, 17, 6–16.
- OPPENHEIM, A.N. (1966). *Questionnaire Design and Attitude Measurement*. London: Heinemann.
- PATTON, M. (1990). *Qualitative Evaluation and Research Methods*. Newbury Park, CA: Sage Publications.
- RICHARDS, R. (2003). 'Keeping our goal in mind'. *Education for Health*, 16, 2–3.
- SATTERFIELD, J., MITTENESS, L., TERVALON, M. & ADLER, N. (2004). Integrating the social and behavioural sciences in an undergraduate medical curriculum: The UCSF essential core. *Academic Medicine*, 79, 6–15.
- SCHMIDT, H.G., NEUFELD, V.R., NOOMAN, Z.M. & OGUNBODE, T. (1991). Network of community-oriented educational institutions for the health sciences. *Academic Medicine*, 66, 259–261.
- SCHMIDT, H., MAGZOU, M., FELETTI, G., NOOMAN, Z. & VLUGGEN, P. (2000). *Handbook of Community-Based Education: Theory and Practices*. Maastricht: Network Publications.
- SEABROOK, M.A., LEMPP, H. & WOODFIELD, S.J. (1999). Extending community involvement in the medical curriculum: Lessons from a case study. *Medical Education*, 33, 838–845.
- SHAW, L. & MACKINNON, J. (2004). A multidimensional view of health. *Education for Health*, 17, 213–222.
- SILVERMAN, D. (2001). *Interpreting Qualitative Data. Methods for analysing talk, text and interaction*. London: Sage Publications.

- STREINER, D.L. & NORMAN, G.R. (2003). *Health Measurement Scales. A practical guide to their development and use*. New York: Oxford University Press.
- TIGELAAR, D.E.H., DOLMANS, D.H.J.M., WOLFHAGEN, H.A.P. & VAN DER VLEUTEN, C.P.M. (2004). The development and validation of a framework for teaching competencies in higher education. *Higher Education*, 48, 253–268.
- WORLD HEALTH ORGANIZATION (WHO) (2000). *World Directory of Medical Schools*. Geneva: World Health Organization.
- WORLD HEALTH ORGANIZATION (WHO) (1987). *Community-based education of health personnel. Report of a WHO Study Group*. Technical Report Series # 746. Geneva: World Health Organization.
- WORLD BANK (2004). World Bank list of economies. <http://www.worldbank.org/data/databytopic/CLASSXLS>. Accessed July 2004.