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Medical education in action: community-based experience and service in Nigeria

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Summary

Problem-based, student-centred learning at the Faculty of Health Sciences, Unilorin, Nigeria were incorporated in the overall objectives of producing students with a sense of service and a strong inclination toward broad community care and preventive medicine. The educational programme reflecting this concept was called COBES (community-based experience and service). Twice a year groups of between seven and fourteen students, each accompanied by two to three staff members, settled in a village or other community for 1 month. According to the Faculty's objectives, each group assessed the size of its community (population, areal map) at first. Malnutrition and infectious diseases were selected as the two health problems which were to be studied in depth during the first two COBES placements. Data were collected and analysed by the students from which deductions were made, and at the end of the placement a written report was required by the Faculty.

Three learning situations and the experience gained from them by one group of students are reported:

(1) What was our community?
(2) The nutritional status of children, and
(3) Guinea-worm infection.

The educational benefits of the programme are discussed and the view of the students is brought out.

A correct assessment of students' performances proved difficult. Other problems were related to the experimental situation of COBES, such as insufficient support of the programme by some staff members, the lack of programme structure and logistical shortcomings. The COBES programme, however, set a pattern of medical education which specifically suits Nigerian needs and probably those of other African countries.

Key words: COMMUNITY MEDICINE/*educ; PREVENTIVE MEDICINE/*educ; *EDUCATION, MEDICAL, UNDERGRADUATE; TEACHING/*methods; NUTRITIONAL STATUS; DRACUNCULOSIS; NIGERIA

Introduction

Most of the medical schools in the developing world have been modelled on their counterparts in industrialized countries of the northern hemisphere. Their educational programmes are not really focussing on the health problems of poor, warm climate countries (communicable diseases, malnutrition and population growth).

In Nigeria for instance, this results in a health care situation in which graduated certified doctors find themselves unaccustomed to assess and evaluate the health needs and priorities of their own country and its people. They are incapable of providing effective health education or implementing preventive programmes. They are ill-prepared to work in the slums of the cities or to manage a rural health care team.

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Problem-based, student-centred and community-oriented learning were basic to the construction of the medical curriculum of the Faculty of Health Sciences, University of Ilorin, Nigeria (Neufeld & Barrows, 1974). The recommendations of the Academic Planning Group and the Working Party on Education of the National University Commission that new medical schools be oriented to the environment and produce students with a sense of service and a strong inclination toward broad community care and preventive medicine, were used as additional guidelines. The COBES (community-based experience and service) educational programme, directed at renewal of both the methods and content of medical education reflected these recommendations and will be described in the following paper.

Design and objectives of COBES

Twice a year, and throughout the second to fifth years of their medical studies, small groups of students, each accompanied by two or three staff-members (called supervisors/tutors) settled in a village or other community for 1 month. Five sites were chosen, two in the outer parts of Ilorin town (urban setting) and the other three spread over Kwara State (rural setting).

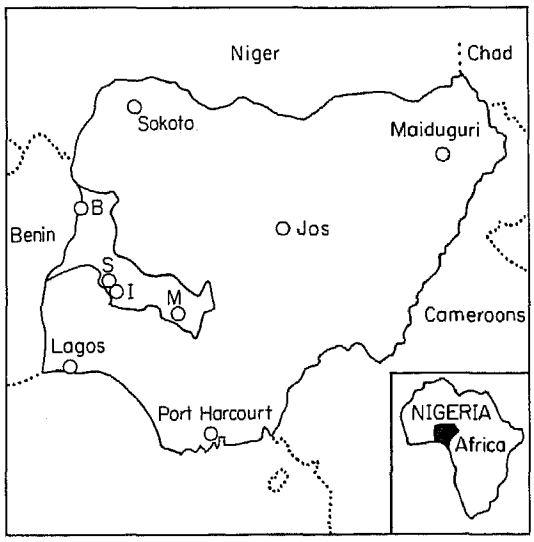

FIG. 1. Map showing Ilorin and the sites for COBES within Kwara State, and Kwara State within Nigeria, I = Ilorin; M = Mopa; S = Shao; B = Babana.

Forty-two students entered the programme initially (October 1978). Some of the more unusual objectives of COBES were to:
(1) sensitize the students to community health needs from the beginning of their student career;
(2) assist community health efforts and prepare the students to work in any community; and
(3) develop team spirit toward promotion of community health and create individual habits of study.

Each of the five groups adopted its own work style, as long as the limited objectives for the first posting (COBES placement) were fulfilled. Each group estimated population size and produced a simple representative map of their areas of work. Each group was to consider aspects of two major health problems, malnutrition and infectious disease. Groups were free to study contributory factors to those such as sewage disposal, sources of water, major occupations, housing and diet. Each group had to collect and analyse data and make deductions in the form of a written report at the end of each COBES placement.

The general goal was to have the students scratch the surface of the problems during their first COBES placement and have them investigate each problem in more detail during subsequent postings.

One group of seven students was living in Babana, a small village in the north-western district of the Borgu Local Government area, some 400 km away from Ilorin (Fig. 1). Depending on the season, the roads were more or less motorable, so that communication was unreliable, transport slow and referral for health care from peripheral dispensaries insecure. Public services were poor and in many places, the illiteracy rate was well above the Nigerian average and diseases due to nutritional deficiencies were widespread. Ethnic, cultural, social and religious variations were prominent.

In the following, we shall let the Babana group speak through fragments of their un-edited reports and thus illustrate learning situations originating from COBES:

(1) What was our community?

We felt that we had to visit the community leaders first in order to learn about the community. We presented ourselves to the local chief ('Sariki') and explained to him the aims and objectives of our medical school. It was essential to get his consent for

the use of available facilities such as school rooms and health clinics. He even granted us permission to visit houses, talk to families and study family cases. We further met with the local health workers in an attempt to receive first-hand impressions and information about the prevailing health problems; we learnt that diarrhoea, cough and high fever made up for the majority of diseases. It became obvious that the two trained health workers of this remote rural place were carrying out a huge amount of work and had to make do with very little in terms of equipment and facilities. Then we came together with the headmaster and teachers of the local school. We and our tutors offered our possible services to the school, e.g. in the form of an assessment of the pupils' health status. The headmaster was smart enough to anticipate language problems we might experience in communicating with the local people and therefore put a well-educated woman at our disposal as an interpreter.

We became eager to know more about the local patterns of health and disease, but found ourselves stuck again with questions that had to be answered first: what kind of people made up the community, what kind of work did they do, what did they earn, and what were their beliefs and customs?

Babana, the district capital, was inhabited by the Bokos, the principal tribe in the area. Other tribal groups such as the Yoruba, the Hausa and some Ibo could be looked upon almost as immigrants and they made up for roughly half of Babana's population. Marami, a village some 11 km away from Babana, was much smaller than the latter. Its population consisted almost exclusively of Bokos. The Fulani on the other hand were semi-nomads; they were scattered over the savannah and their habitat was geared by the availability of water and food for rearing their cattle.

The total population of Bokos in Babana, Marami, and among the Fulani in neighbouring camps of the district stood at 408, 281 and 252 respectively. When we analysed the groups by age and sex, several points were noteworthy. The ratio between the 0–1 and 2–4 years' age groups amounted to 1:4. From this ratio we inferred that most deaths among the <5 years' age group had occurred during the very first year and that there had been no fatal epidemics for the past 4 years. For the 5–9 years' age group we counted nearly twice as many males as females in Babana and Marami. Trying to explain this phenomenon it struck us that we were concerned here with the school-age group and these uneven distributions applied only to the two places which had schools. The situation well reflected the idea of these rural people, that there was no use in future housewives being educated. None of the youngsters in the Fulani camps we visited were reported to go to school. We know that the Fulani are rearing cattle mainly, which, along with the pattern of lifelong wandering from pasture to pasture, accounts for the absence of Fulani at school.

The fact that there were always more females than males in the group >10 years' age was explained by the trend of young men moving out to seek their fortune, while young women awaited motherhood and marriage, and by the fact that men have more than one wife.

When we visited the same community again in April 1979, at the end of the dry season, we were astonished by the changes in the population composition. The number of the Fulani, for example, had decreased by about 30% as a result of the scarcity of food and water. The number of children in the 2–4 years' age group had also decreased, whereas the children of 5–9 years had increased. We attributed this difference to the fact that the exact age of the children was unknown to the parents and that errors might, therefore, have been incorporated because we tried to separate the <5 from the >5 years of age. In other words, environmental and cultural factors seemingly influenced the accuracy of our statistical numbers.

To make a census of the people was difficult for other reasons. Not knowing the local language was one of them. Apart from the fact that not all the English words had equivalents in the local language, an additional difficulty was that the answers not only depended on the addressee's understanding of the questions, but also on the interpreter's understanding. We found out that we had to ask people questions about themselves and that we confused the people when we asked big, general questions; for example, 'Do you raise small animals?' was a bad question whereas 'How many chickens does your family have this year? how many cows? how many sheep? could be easily answered by the people.

Another difficulty was that mothers exhibited emotional stress when having to answer questions about their dead children. Therefore we avoided this subject as much as possible. Finally, parents found it easier to hand us data about children present at the moment than about those who happened to be absent.

(2) The nutritional status of children

Malnutrition was seen as a possible health problem affecting one community more than another and thus arose the idea to conduct a survey and compare the status of nutrition between the children living among the Bokos, in Babana and Marami, and Fulani children.

Prior to the survey we were briefed by our tutors on simple ways to measure the nutritional status of children. The results of this survey have been described elsewhere (Bollag *et al.*, 1980). There were no learning resources other than some basic readings and a few articles pertinent to the topic (Shakir & Morley, 1974; Arnhold, 1969). We had no weighing scale due to financial constraints, and thus were unable to weigh the children. However, by means of coloured arm bands, we could measure the mid-upper arm circumference of the children and by means of a simple tape we could measure their height.

Although we were able to ask the families about the availability of food (food production, opportunities to buy and sell food) and feeding patterns and although we were able to record our measurements, we experienced considerable trouble in the interpretation of our figures. However, we learned more about medical statistics and more specifically on the use of standardization to give reliable age/sex specific rates (Barker, 1976), between the first COBES rotation in October 1978 and the second in April 1979.

We repeated the nutritional survey during our second COBES rotation in April 1979; not only could we demonstrate that there had been fewer malnourished children in the 5 years' age group (assessed by the mid-upper arm circumference) at Babana than in the other two communities in October 1978, but also that the dry season had caused the gap to become wider. Fulani children suffered most from the effects of the dry season. The question to be answered was why Babana had maintained monopoly of the first position on the nutrition chart.

Babana had the singular advantage of being in possession of the only major market, so that regardless of the season there had never been a shortage of food in Babana. The place enjoyed further advantages: even when water was scarce in the surroundings, Babana had a stream that did not completely dry up in the dry season. Finally, Babana had the only dispensary in the district and was benefitting from the direct influence of the government in that a few state governmental facilities had been established there (court, police post, power house and a maternity health centre).

(3) Guinea-worm infection in Dekala

While we had seen cases with Guinea-worm infection in October 1978, it happened that, during our second COBES rotation in April 1979, the community of Dekala, a hamlet situated some 35 km west of Babana, called for our help. What an ideal learning situation for us; Guinea-worm infection, a problem suffered by the people themselves on one hand could be coupled with the stated objective to look into the problem of infectious diseases during COBES on the other.

The transmission cycle of Guinea-worm infection (source, vector, host) was known to us from the reading which had been assigned to us by the tutors prior to leaving for Dekala (Parry, 1976).

All of the 109 cases reported were located at Dekala; fifty-two males and fifty-seven females were found to be infected. Thus the disease did not seem to distinguish between the sexes. Among those infected, the ages ranged from 2 to 60 years, but only three children of <5 years were included. We attributed this to the fact that the very young were not yet sent to fetch water and therefore did not get in close touch with the source of the infection. The site of infection usually was on the lower extremities, sometimes on the breasts in females and the scrotum in males.

Interviews, held with some members of the community, disclosed that the Guinea-worm infection was believed to have been introduced from a neighbouring hamlet through inter-marriage. By further enquiries we learned that there were two families, one of them the family of the 'Sariki', who had not had any Guinea-worm infections. These families boiled their drinking water. As a matter of fact, the Sariki had a transistor radio, and had listened from time to time to broadcast lessons. That is how he had learned never to drink any unboiled or untreated water. We wondered whether the power of the Sariki as leader of the community could not be used to change the hazardous habits of his people. We argued further that the presence of medical professionals from a University would certainly have a favourable effect on the credibility of his educational talk. Fortunately, he agreed with our idea and so gathered all the villagers under a huge tree and

delivered a speech to them emphasizing the necessity of boiling any water for drinking purposes.

The only water source at Dekala was a dirty pond. Microscopic examination of a specimen of the water showed the causative agent of the disease, the cyclops. We mounted our microscope on the bonnet of our vehicle and encouraged the people to look at the organism responsible for all their suffering. Now they were even better able to grasp the Sariki's warning never to wade into the pond with the contaminated water.

Many patients presented with superinfected wounds where the worm had found its way out. We cleansed the lesions and in some cases administered antibiotic drugs to control secondary infection.

At the end of the day one of the tutors demonstrated how a tiny fraction of Dettol® sufficed to kill the cyclops. If this measure was to be applied in regular 2–3 month intervals, and if all infected people were treated successfully or the worm was absorbed or extruded, the dissemination of the disease could be stopped. We instructed the teacher in the village to repeat the disinfection of water with Dettol®, a bottle of which we left with him.

Discussion

The activities as described by the Babana group of students make it possible to draw three conclusions. The first is that the learning process can be greatly facilitated by direct, concrete confrontation with health problems. The Guinea-worm episode shows particularly how both parasitological and epidemiological knowledge can be acquired and integrated in the context of joint preventive and curative actions; the acquisition of knowledge is intimately related to the use of such knowledge. It has been shown that generally speaking a learning situation of this kind leads to the acquired knowledge being better memorized and being used with greater flexibility (Mayer & Greeno, 1972).

The second conclusion is that COBES really gives students the opportunity to observe health and disease in their relationship with the environment and with the people's habits, both intricately intertwined with each other. The students came to appreciate the influence that the local food situation had on the state of nutrition of the children; they themselves perceived the hazard infected people created for the community when they waded into the pool from which water was drawn for drinking. Such insight makes it more logical and desirable to interfere effectively in an early stage for the benefit of people's health. Medical education of the traditional kind usually implies that students are only shown the final stage of the process of a disease: the sick person who is admitted to a hospital. This may result in the students seeing their task as future doctors to be concerned with the curing of individual patients only. The Guinea-worm experience clearly shows how incorrect and pointless such an attitude would be. The third conclusion is that education which prompts students to engage actively in their studies appears to be highly motivating. This was evidenced by the enthusiasm with which the students prepared themselves and the satisfaction they found in performing their tasks. The students were given the opportunity to comment on COBES, and were asked to state specifically what had been gained by the study project. Table 1 contains a selected list of students' quotations. While the statements of the students brought out what they felt they had gained by their studies in COBES, and while they served the Faculty as valuable feedback, provision had been made for

TABLE 1. Documentation of learning as reflected in the students' statements

(a) ... We have been able to interact with the community, and we have been able to gain some knowledge about the people's way of life, which will help us in the future COBES postings, e.g. methods of approach to the community.

(b) ... We have been able to identify some of the people's health problems and needs which will enable us to plan ways of helping them in future...

(c) ... COBES enabled us to have a broad view of the scope of problems a doctor would encounter in a rural community and this would have obvious advantages if one is posted to a rural community later in life...

(d) ... We have had the benefits of seeing health problems in real life and their relationship to the community such that when we read about these in our course, we would have a better grasp and understanding...

(d) ... We have had the opportunity to do creative work, tackling problems as they arise, formulating possible hypotheses from observations...

(f) ... The problems and challenges we saw open to a medical doctor stimulated our interest more towards the study of medicine...

(g) ... We have been able to work harmoniously as a team making constructive suggestions and criticism where applicable...

Student's name .....
Group leader .....
(staff)
Date of posting .....
Place of posting .....

1 unsatisfactory	2	3 satisfactory	4	5 distinction

Please mark X in the appropriate box below

	Mid-posting	End of posting
1. Appearance and general behaviour	☐☐☐☐☐	☐☐☐☐☐
2. Punctuality	☐☐☐☐☐	☐☐☐☐☐
3. Attitude toward the COBES programme	☐☐☐☐☐	☐☐☐☐☐
4. Relationship to other students	☐☐☐☐☐	☐☐☐☐☐
5. Relationship to people in the community	☐☐☐☐☐	☐☐☐☐☐
6. Collection of data	☐☐☐☐☐	☐☐☐☐☐
7. Presentation of data	☐☐☐☐☐	☐☐☐☐☐
8. Interpretation of data	☐☐☐☐☐	☐☐☐☐☐
9. Ability to relate findings to solving community health problems	☐☐☐☐☐	☐☐☐☐☐
10. Student's critique of his own approach to the problems	☐☐☐☐☐	☐☐☐☐☐
11. Ability to suggest new approaches to the solution of problems	☐☐☐☐☐	☐☐☐☐☐
12. Contribution to group discussion	☐☐☐☐☐	☐☐☐☐☐
13. Performance in crisis situation	☐☐☐☐☐	☐☐☐☐☐
14. Assessment of the student's written report	☐☐☐☐☐	☐☐☐☐☐
	TOTAL SCORE	☐

Remarks by the group leader .....

Student's comments on his own performance. (The group leader is to discuss the performance with the student concerned, at midposting and end of posting and enter here relevant points which might come out of the discussion)

Date ..... Signature of the group leader .....

FIG. 2. COBES: Education of student's performance.

more objective evaluation. The proximity of students and tutors during the postings made it easy to exchange ideas, pass on knowledge and correct mistakes in an ongoing and informal way. Moreover each student's performance was evaluated by a Linkert-type 5-point scale (Best, 1977). An abbreviated form for the evaluation of students' performance is shown in Fig. 2. The written reports served as another device for the assessment of the work done by the students during COBES. These records went into permanent record. Finally, a planary was organized in Ilorin after each COBES rotation with all students and tutors being present and the groups presenting their findings to each other. Apart from serving as teaching/learning sessions, these meetings constituted an opportunity for the students to voice their complaints on any aspect of COBES and make proposals for improvement.

However it was felt by staff and students alike that the extent and complexity of the COBES programme made evaluation a difficult enterprise. Clearly more precise learning objectives were needed for COBES before succinct evaluation criteria could be developed.

The COBES programme constituted an experimental situation in the first year of a new faculty. Elements of confusion, ill-definition, disagreement and error were inevitable. A fundamental problem arose from the incomplete negotiation of role-sets for tutors. The personal insecurity inherent in a situation like COBES can be particularly threatening to professional people used to being thoroughly competent, and accepted as such, within their own specialist field. For example, in Babana students regularly needed the assistance of staff members not present at the station. The distance to, and the poor accessibility of Babana made it unattractive for many staff to teach on the spot. Nor was the enthusiasm great to share the students' primitive living conditions for a long time.

A second major problem was the rather serious doubt and uncertainties on the part of some staff members with regard to the value of the COBES programme. At the time of the second COBES placement the programme was already faced with the question that any educational innovation is confronted with, Does this innovation really lead to the desired goals? The Faculty did not take the time to present this question explicitly for reflection and thereby lost the active participation of a number of its Nigerian staff members. As a consequence the programme needed to rely to a higher degree on expatriates than was acceptable to ensure its continuity.

The need to form a COBES planning team became obvious after the first two placements. Such a team might work out academic proposals for the whole 5-year programme in terms of learning objectives and principal themes which would be common to all groups. Every speciality represented in the teaching staff could submit detailed proposals for their own potential contributions and this would facilitate the integrated programme which COBES reflected.

The lack of resources (finances and manpower) greatly hampered the educational input of COBES. It was felt that each COBES area should develop a resource bank of its own, including:

(1) standard equipment for clinical investigation, simple laboratory tests and storage of specimens;

(2) a small library of reference books relevant to the student's work in the area;

(3) collections of papers and reviews as resources for specific projects; and

(4) copies of reports and data from all previous student work.

Non-expert area tutors would require specialist assistance from many disciplines represented in the teaching staff; topics for instruction and in-service training would include area management and liaison, student guidance, problem and task definition, resources management, project monitoring and continuous evaluation.

Conclusion

A sound and modern philosophy about education as such does not suffice to bring about the desired changes in students who, in the future, are to organize and run the health care system in rural and urban areas. A society which is willing to alter its health care system should not rely exclusively on the idealism of a few who are prepared to work among the poorest and most deprived. Working in the bush should also be attractive to non-idealists. One of the authors of this report, (H.S.) an external consultant of the Faculty of Health Sciences, interviewed students about COBES and discovered that although the students in question supported wholeheartedly the teaching staff's educational philosophy, they doubted whether they would later appreciate spending long years working under primitive conditions. This remains a key issue in medical training and manpower planning for developing countries.

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