

Problem-based medical education in general practice: experience from Linköping, Sweden

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SUMMARY. *Medical services which are better suited to the needs of the community are increasingly demanded, for example by national governments, and depend to a great extent on education of the new generations of doctors. Problem-based learning in general practice at the community level represents a method of providing appropriate education. This paper describes some of the experiences of undergraduate and continuing medical education at the Faculty of Health Sciences, Linköping University, Sweden, which since 1986 have been entirely problem-based. General practice forms the backbone of the curriculum and is its largest subject. Problem-based learning in general practice and quality assurance have much in common. This applies over the spectrum of lifelong education, from the undergraduate curriculum through vocational training to later stages of continuing medical education. Involvement and understanding, a feeling of purpose, sharing and co-operation and a wish for self-improvement are all stimulated by the problem-based method. This approach has helped in the creation of a curriculum with general practice as the largest contributor, with early contact with patients in the community, and with ordinary general practitioners as teachers, tutors and examiners in spite of a relatively poorly developed primary care organization.*

Keywords: *problem solving; educational methods; curriculum; undergraduate training; continuing education.*

Introduction

AS Steve Iliffe has pointed out in this *Journal*¹ the fundamental pattern of medical education may be changing, shifting a considerable part of medical education into community settings. Learning medicine in general practice offers the student opportunities that cannot be found easily in hospital-based education. Epidemiology, pathology and therapy can be integrated through a problem-solving approach to casework, producing graduates with the necessary cognitive and communicative skills through a process of individual but guided study that appears to promote later academic and research interests. The natural bias of general practice towards problem solving facilitates the development of an in-depth, 'elaborating' style of learning that correlates well with knowledge retention and high examination performance and by which communication and patient education techniques can be learned by treating them as specific skills to be acquired.

In order to provide innovative medical services doctors need correspondingly innovative education and training. Changes in

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undergraduate medical education began in the United Kingdom^{2,3} but we believe our experiences of a new undergraduate and postgraduate medical curriculum at the Faculty of Health Sciences, Linköping University, Sweden may be of value and interest. The new medical curriculum has been developed and successfully implemented with a comparatively small faculty staff owing to an extensive and important contribution from local general practice. This paper describes our experiences of how this was done, concentrating on problem-based learning and community-oriented medical education.

Primary care in the health policy era

Barton has stated that we are now in the health policy era.⁴ In both developing and developed countries health is increasingly seen as a basic civil right for all citizens, and is an area of public concern. This is exemplified by the World Health Organization's 'Health for all by the year 2000' programme,^{5,6} and at a local level by many national and regional initiatives.⁷⁻¹⁵ All aim at equity in health, that is, a fair distribution throughout the country based on health care needs and ease of access in each geographical area,¹⁶ placing general practice and education for general practice at the centre of developments.

The importance of community-oriented medical education is gradually becoming appreciated.¹⁷ This form of education emphasizes primary care and is currently being implemented throughout the world.¹⁸ The medical faculty at Linköping University is a member of the International Network of Community-Oriented Educational Institutions for the Health Sciences,¹⁸ which provides a forum for sharing experiences and knowledge with other universities.¹⁷⁻¹⁹

In Sweden, more than 9% of the gross national product is spent on health and hospital care, which is largely publicly financed and is administered through a governmental organization — the landsting (county councils). However, only a comparatively small proportion of Sweden's physicians are general practitioners (about 15%). So, although 'a consensus is developing that identifies general practice as a prime site for teaching all medicine, not just general practice',¹ the problem has been to create a curriculum with general practice as a large contributor and with early contacts with patients in the community, in a country where primary care is relatively poorly developed.

Reformed medical education

There are many reasons for emphasizing general practice in a new curriculum for medical education. The importance of several sciences closely related to general practice, such as epidemiology, sociology, public health and health promotion, also needs to be reinforced. However, perhaps the most important areas are the basic skills of medical practice, that is, those related to the consultation — the doctor-patient interaction, communication, and the diagnostic and therapeutic process — which are best learnt in general practice.¹⁻³

It is often forgotten that the scientific implications of reformed medical education are large. This is expressed both in the World Health Organization's health for all target 32:

'By the year 2000, health research should strengthen the acquisition and application of knowledge in support of

health for all development in all member states.'

and in the appended research publications:^{20,21}

'Scientific studies on present and future education [and] the goals of the academic training ... and thus where improvements are most urgently needed ... should compare the objectives, curricula and results (in knowledge, skills, attitudes and motivation) of educational programmes ... with the objectives and service requirements of new health care needs ... educational programmes should therefore strive to impart attitudes, motivation and values that attract students to primary health care ... pedagogical research could help in this task.'²⁰

The medical curriculum at the Faculty of Health Sciences, Linköping University, with its problem-based learning and large contribution from general practice requires careful evaluation since:

'Different systems of undergraduate, graduate and continuing education for health professionals should be compared. How do these systems affect students' perception of primary health care and their motivation and ability to work with people in other health professions? In addition, case studies of failures and successes in introducing new systems of medical education specially oriented towards primary health care would be extremely valuable.'²⁰

Problem-based undergraduate medical education

Problem-based learning is not a new method.²² It was introduced into medical education at MacMaster University, Canada in the middle of the 1960s²³⁻²⁵ and then in other universities, for example, Maastricht in the Netherlands, and Newcastle in Australia.^{26,27} In this method of learning the problem becomes a stimulus for the learning process.¹⁹ By exposure to relevant situations, students' clinical reasoning skills are catalysed²⁴ promoting their ability for development and undertaking initiatives but at the same time supporting teamwork and cross-sectoral collaboration, for example with social workers or pharmacists.

Problem-based learning is an alternative to the orthodox, 'top-down' transfusion of facts from teachers; it is instead a 'ground-up' engendering of active skills in young, eager and naturally problem-solving minds. It fosters life-long learning, a holistic view, and is closely connected to community-oriented medical education. Iliffe also noted that problem-based learning promotes later academic and research interests.¹

Problem-based learning requires a teacher-student relationship where the teacher is a facilitator. When developing a new curriculum this can present a considerable problem since those supposed to work as tutors have themselves been educated in a traditional system. With the development of problem-based learning and community-oriented medical education there is a need to strengthen learning about the doctor-patient relationship. It is not surprising that those universities who have implemented problem-based learning and aspects of community-oriented medical education have also instituted early contacts with patients, integration of clinical and preclinical teaching and training in consultation skills.¹⁹ This increases the need for general practice involvement. However, to the best of our knowledge the extent of the involvement of general practice in the curriculum at Linköping is unique.

The Linköping experience

In 1986 problem-based learning was adopted at the Faculty of

Health Sciences, Linköping University for all undergraduate medical education as well as for the education of other health professionals (general nursing, laboratory technology, physiotherapy, occupational therapy and community care).^{19,28-31} The curriculum integrates preclinical and clinical medicine using organ systems as building blocks. It is divided into three phases instead of specialties — phase I, semesters one to three: 'Cells, man and society'; phase II, semesters four and five: 'Health and disease'; and phase III, semesters six to 11: 'Clinical medicine, community medicine and human biology'. The curriculum aims at as much integration as possible with the study programmes of other health professionals.^{28,30} Other important general characteristics of the programme are the synthesis of human biology and clinical medicine, focus on common health problems, encouragement of a holistic view, emphasis on prevention and health promotion, and early contact with patients.¹⁹

The undergraduate education's community orientation is ensured from the start by a course called 'Man-society' which is undertaken during the first 10 weeks of the first semester by those taking all study programmes. In the course, primary health care is introduced, and in the following strand for communication skills in semesters one to five the students regularly carry out consultations with real patients which are videotaped, and followed by a group meeting with discussion and feedback from the other students, the general practitioner and the supervisor (usually a behavioural therapist).¹⁹ This strand, in which the students gain the basic patterns of professional development in general practice, currently involve 25 of the 38 primary care centres in the county.¹⁹ Each of semesters six to 10 contains a three-week clerkship in a primary care centre alternating between rural and urban areas. Semester 11 concludes with a six-week course in community medicine.¹⁹ General practitioners play a leading role in all these community-oriented aspects of the education and in the examinations at the end of the main phases.¹⁹

Assessment in general practice

In principle, it is natural that general practitioners should take part in the examinations since these involve essentially the same standards and techniques as the curriculum. It has been said that assessment in medical education is an integral part of the 'educational triangle' of aims, methods and assessment^{32,33} and accordingly, examinations aim to provide support, guidance and reinforcement rather than to rank candidates in order.¹⁹ All general practitioners involved in the strand are also examiners in the examination at the end of semesters three and five. The general practitioners assess the student's performance in a videotaped consultation with a patient in a primary care centre, and with a basic scientist assess the student's knowledge displayed in the consultation in depth. Special rating scales have been developed within the strand and are identical to those used for the continuing formative assessment during the semesters. The consultation must be approved for the candidate to pass the examination. About 40% of all general practitioners in the area are or have been participating in the assessment. The examinations have had a considerable impact on students, general practitioners and basic scientists¹⁹ and are currently under further study in the university department of general practice and primary care.

Continuing medical education

Overall, resources for postgraduate training in general practice are not well developed in Sweden. With the development of the new undergraduate educational programme a new organization, the Centre for General Practitioners, was formed in 1992 in the

county of Östergötland. The three main tasks of the centre are: providing vocational training; recruiting to and training in general practice for other disciplines; and providing continuing medical education for general practitioners. Three part-time general practitioners (one assigned as director), one administrative assistant and one educational director constitute the staff of the centre which is located in the University of Linköping with the department of general practice and primary care. The close cooperation between the centre and the department has resulted in several joint ventures, for instance, communication training for vocational trainees using the strand in the undergraduate curriculum as a model, and a joint training course in tutoring for both general practitioners tutoring undergraduate students and general practitioners tutoring vocational trainees. Small groups of general practitioners undertaking continuing medical education have also started to work in a problem-oriented way influenced by the undergraduate curriculum. Future general practitioners familiar with community-oriented medical education and problem-based learning are likely to put increasing demands on the quality and design of continuing medical education.

Quality assurance

Five full batches of students undertaking the new curriculum have now been examined. In general it can be claimed that the assessments both of and by the students and teachers have been positive, for example, regarding their overall satisfaction and the fulfilment of the targets set for the education.¹⁹ However, a more rigorous evaluation with defined criteria of accomplishment and measures of clinical competence is now required.

Quality assurance offers a practicable means for a first-order assessment of problem-based education. There are close analogies between quality assurance and problem-based learning. Both comprise three, slightly overlapping principal components or aspects: content (what is to be quality assured/educated); technology (aids, methods used); and process (how the quality assurance/problem-based learning is performed and attained).

Table 1 compares problem-based learning and quality assurance. Michael Boland and colleagues noted the correspondence between continuing medical education for general practitioners and quality assurance (WONCA-SIMG congress, The Hague, Netherlands, June 1993), and the same applies to a problem-based undergraduate curriculum. Problem-based learning must primarily be judged from what it sets out to achieve. In that respect, and especially in general practice, skills like communication, doctor-patient interaction, interviewing, an holistic view, community involvement and deductive reasoning have been identified as cardinal elements of problem-based learning.^{1,19} Much labour has been expended in devising valid and reliable instruments for the assessment of such learning,^{34,35} and a number of methods have been developed.³⁵ However, further devel-

opment is warranted, for example methods for assessing 'consultation skills and the process of care'.³⁵

Discussion

Primary care is a vital part of modern medicine, and problem-based learning/community-oriented medical education in general practice is the natural form of education for primary care. The entire undergraduate medical curriculum at the Faculty of Health Sciences, Linköping University is problem based and general practice is its backbone and largest subject. Such a form of education has much in common with quality assurance in which the essential targets are defined and examined in a feedback sequence. The importance of the curriculum at Linköping is that it is directly relevant to clinical practice. It is directed to new basic sciences and medicine in society as well as to the clinical arts like communication, the patient-doctor interaction, and the therapeutic process. Fostering and assessment of these clinical arts is especially important since they are not adequately covered in the education and examinations of orthodox medical curricula. The design of the curriculum and examinations results in the involvement of general practitioners in a process of quality assurance of the basic skills, knowledge and attitudes of students.

In spite of a small faculty staff, general practice plays a prominent role in undergraduate medical education in Linköping. It is too early to say how this will affect students' career choices but this will be analysed further. General practice involvement in training and examination of communication skills has resulted in the development of new instruments for assessment which will be used to investigate how the students progress with the curriculum.

The impact of the new curriculum on the participating general practitioners will also be studied, examining how they carry out the unfamiliar role of tutor while at the same time continuing with busy daily clinics. The joint community-oriented and problem-based education has been accepted readily by the participating general practitioners because of the similarities with their own working style. The emphasis on basic skills would also seem natural for general practitioners. Both the continuity of the participation and the involvement in continuous assessment are essential factors ensuring that the educational tasks are seen as empowering rather than exhausting for the general practitioner, both professionally and personally. However, systematic training in the role of tutor is required to ensure continuing success.

Students receiving an education that involves problem-based, community-oriented learning in general practice and thus being used to giving and receiving personal feedback are likely to place new demands on vocational training and continuing medical education. With the close cooperation between undergraduate, vocational and continuing medical education at Linköping we will be prepared for this new challenge. The similarity between problem-based learning and quality assurance offers an intrinsic model of management and evaluation in terms of the setting and fulfilment of goals and satisfaction of expectations and needs. This model will be focused upon in the continuation of the study, as will its implications and uses in student examinations.

Table 1. Comparison of the seven steps in quality assurance and problem-based learning.

Quality assurance	Problem-based learning
1. Describe	Clarify terms and ideas
2. Select	Define main and partial problems
3. Analyse	Take stock of opinions and ideas about them
4. Plan	Systematize the inventory
5. Set goals	Formulate learning goals
6. Act	Acquire knowledge in relation to learning needs
7. Follow up	Synthesize knowledge

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