ABSTRACT  Mentoring programmes have been implemented as a specific career-advancement tool in the training and further education of various groups in the medical profession. The main focus of our investigation was to examine what types of structured mentoring programmes exist for doctors as well as for medical students, what short- and long-term goals these projects pursue, and whether statements can be made on the effectiveness and efficiency of these programmes. A literature-search strategy was applied to Medline for 1966–2002 using the keyword combinations: (a) mentor* [AND] program* [AND] medical students, and (b) mentor* [AND] program* [AND] physicians. Although a total of 162 publications were identified, only 16 papers (nine for medical students and seven for doctors) met the selected methodological criteria. The majority of the programmes lack a concrete structure as well as a short- and long-term evaluation. Main goals are to increase professional competence in research and in further specialization and to build up a professional network for the mentees; no statements are to be found on the advantages for the mentors. Programme evaluation is for the most part presented descriptively in terms of great interest and high level of satisfaction. No publication contains statements on the effectiveness or the efficiency of the programme. Although the results of mentoring are promising, more formal programmes with clear setup goals and a short- and long-term evaluation of the individual successes of the participants as well as the cost-benefit analysis are needed.

Mentoring and mentoring programmes

Mentoring was developed in the USA in the 1970s in large private-sector corporations to support junior staff. Since the 1990s, mentoring programmes have been introduced in various groups in the medical profession. They are found most frequently in the field of nursing. Formal mentoring programmes for medical students and doctors, however, have only recently been developed. It was, therefore, of special interest to search for mentoring programmes for these two medical professional groups in the literature. Women are under-represented in the higher echelons of medicine. Therefore, some programmes have been implemented exclusively to support women (Levinson et al., 1991; Morahan et al., 2001). Other target groups of mentoring programmes are handicapped people and/or members of ethnic minorities (Johnson et al., 1998; Abernethy, 1999).

There exist different mentoring models: the classic one-to-one mentoring between mentor and mentee; group mentoring, a (small) group of mentees supervised by a mentor; individual or group mentoring with a number of mentors (the multiple-mentor experience model); and mentoring among co-equals (peer mentoring).

Objectives and issues

It is the aim of this paper to investigate the following issues:

(1) What types of structured mentoring programmes for medical students and doctors are reported in the scientific medical literature?
(2) What short- and long-term goals do these projects pursue?
(3) Are statements on both their short- and long-term successes possible?
(4) Can concrete statements be made on the effectiveness (i.e. the efficacy of the measures) and efficiency (meaning the cost-effectiveness, i.e. the ratio

Practice points

What is already known?

- Mentoring has proved to be an important career-advancement tool, especially for women. Over the last few decades, structured mentoring programmes have been designed for health professionals, mainly nurses, but not many for medical students and doctors.

What does this study add?

- The present literature review aimed at reporting what types of structured mentoring programmes exist for doctors and students. Only 16 mentoring programmes – one-to-one, group and peer mentoring models – could be identified which give the duration of the programme, the exact number of participants, concrete goals, evaluation and results as well as data on effectiveness and efficacy.

Suggestions for further research

- In an era of ‘feminization of medicine’, mentoring programmes may acquire increasing importance. Of special interest would be an evaluation of the individual successes of participants in a control design with and without mentoring over a fairly long period.

Correspondence

Professor Barbara Buddeberg-Fischer, Department of Psychosocial Medicine, University Hospital Zurich, Haldenbachstr. 18, CH-8091, Zurich, Switzerland; email: barbara.buddeberg@usz.ch
between money spent and success) of mentoring programmes?

Methods

The search strategy for this paper was set up to identify any scientific paper on mentoring programmes for medical students and doctors.

The search strategy was elaborated in the following steps:

(1) An online search dated April 2003 (google) with the term mentor* generated more than two million hits. The term mentor* was applied in order to include the terms mentor, mentoring and mentorship.

(2) To distinguish between scientific and popular literature and between the medical field and other professional fields we decided to limit the search strategy on Medline, which is the greatest worldwide medical bibliography data base.

(3) For the term mentor*, 3,052 sources were found.

(4) Finally, the following keyword combinations (a) mentor* [AND] program* [AND] medical students, and (b) mentor* [AND] program* [AND] physicians were used for the Medline search. The term program* was chosen to include program(s) and programme(s).

(5) Using the search strategy in the period from 1966–31.12.2002, we found a total of 162 articles. The keyword combination (a) revealed 71, and the keyword combination (b) 91 papers. Of these 162 publications, 19 were listed under both, medical students and doctors.

(6) Titles and abstracts identified by each of the searches were read by both authors. Papers that were easily identifiable as outside the scope of this study were excluded. The remaining papers were passed onto the next stage.

(7) The full version of the paper was read by the two authors independently to determine suitability for inclusion.

The following inclusion criteria were established:

(1) The aim of the mentoring project is the advancement of the mentee’s career with respect to an activity in patient care, medical basic research, clinical research, the university/academic field, and/or alternative professional fields.

(2) The mentoring programme aims at the advancement and consolidation of academic/professional and non-academic/non-professional competencies.

(3) Mentoring does not foster individual capabilities, skills or knowledge, but represents a combined, integrated approach to supporting the all-round development of the mentee.

(4) The education and training level normally considered appropriate for the mentee at his/her particular stage is surpassed.

(5) The mentee is either a medical student or a doctor.

(6) The mentor is from a medical professional group and has already pursued a successful career.

(7) During the mentoring programme there exists a fixed relationship between a mentor and one or more mentees, or alternatively between a clearly defined number of mentors and a group of mentees.

(8) The minimum length of the mentoring programme is 6 months.

(9) The paper involves a final or interim evaluation (the latter after a minimum period of 6 months) of the accompanying evaluation of a medical institution’s structured mentoring programme.

In the last (8) stage, the full versions of the papers meeting the inclusion criteria were examined, and the publication data were compiled according to the following categories:

(1) Year published, author and country of origin.

(2) Duration of programme.

(3) Number of participants and the category they belong to (generally, as for example students or doctors; specifically, as for example women or ethnic minorities).

(4) Programme structure.

(5) Aims of the programme: Introduction to studies, Career in health-care institutions, Clinical research, Medical basic research, Academic/university career and/or alternative professional fields.

(6) Type of evaluation.

(7) Programme results, possibly details of the costs.

(8) Advantages and disadvantages of the programme.

Results

The aim of this paper was to achieve an overview of the existing structured mentoring programmes for medical students and doctors, the goals aspired to, their outcome and their effectiveness and efficacy. As in other medical fields, the last few years have seen an exponential increase in the number of publications on the subject of mentoring. The first article on the subject of mentoring listed in the Medline database is from the year 1967 (Escoll & Wood, 1967). More papers were published in the year 2001 alone (n = 391) than between 1981–1990 as a whole (n = 335).

Of the 162 papers found by the described search strategy, only 16 papers fulfilled the described inclusion criteria. Most of the 162 publications limit themselves to the description of the current situation and the demand for specific mentoring programmes. In the 16 selected publications sufficient information was given to undertake categorization according to the described method. Nine of these papers describe mentoring programmes for medical students (Stockers et al., 1981; Lemon et al., 1995; Forrow & Wolf, 1998; Gonzales et al., 1998; Woessner et al., 1998; Abernethy, 1999; Frishman, 2001; Haq et al., 2002; Kalet et al., 2002), seven for doctors (Mahood et al., 1994; Morzinski et al., 1996; Nasmith et al., 1997; Jogerst et al., 1998; Johnson et al., 1998; Markakis et al., 2000; Pechura, 2001). With some of the papers, missing information meant that certain individual categories could not be taken into account. Thus, for example, the exact number of participating mentees is missing in four publications (Stockers et al., 1981; Johnson et al., 1998; Woessner et al., 1998;
Markakis et al., 2000), and the number of mentors in eight papers (Slockers et al., 1981; Forrow & Wolf, 1998; Gonzales et al., 1998; Johnson et al., 1998; Markakis et al., 2000; Frishman, 2001; Haq et al., 2002; Kalet et al., 2002). The evaluation instruments (e.g. questionnaires and other written feedback or surveys via interviews) are not given in two publications (Gonzales et al., 1998; Haq et al., 2002). An overview of the mentoring programmes described in greater detail below can be found in Table 1 (medical students) and Table 2 (doctors).

**Formal mentoring programmes for medical students (Table 1)**

**Participants**

**Mentees.** Seven of the nine programmes for students are from American institutions (Lemon et al., 1995; Forrow & Wolf, 1998; Gonzales et al., 1998; Abernethy, 1999; Frishman, 2001; Haq et al., 2002; Kalet et al., 2002, and one each from the Netherlands (Slockers et al., 1981) and Germany (Woessner et al., 1998). Two-thirds of all the programmes are exclusively intended for first- to third-year medical students (Slockers et al., 1981; Lemon et al., 1995; Gonzales et al., 1998; Abernethy, 1999; Haq et al., 2002; Kalet et al., 2002). In one project, in addition to medical students, students from other medical professional groups (such as trainee nurses and future social workers) take part as mentees (Forrow & Wolf, 1998). In one programme, the mentees are students from ethnic minorities (Abernethy, 1999).

**Mentors.** Experienced doctors in higher positions, who for the most part work at the university institution running the mentoring project, act as mentors. The percentage of women among the mentors is given in only one of the programmes (Lemon et al., 1995).

**Short- and long-term aims**

Of the six programmes for first- to third-year students, one programme serves exclusively as an introduction to everyday student life (Slockers et al., 1981), one aims to recruit future doctors into general practice (Lemon et al., 1995) and one aims to prepare students from ethnic minorities for the clinical part of the course of study (Abernethy, 1999). Three of the programmes for students convey specific research knowledge early on within the framework of the mentoring relationship (Gonzales et al., 1998; Frishman, 2001; Haq et al., 2002). Two of the programmes are designed to further acquaint participating mentees with the basic medical care institutions of underprivileged segments of the population (Forrow & Wolf, 1998; Haq et al., 2002). Within the framework of the mentoring relationship, a research topic is to be dealt with in one of these two programmes (Haq et al., 2002). The aim of building up a network of mentees is explicitly mentioned in two papers (Forrow & Wolf, 1998; Haq et al., 2002). In three programmes for students (Gonzales et al., 1998; Abernethy, 1999; Haq et al., 2002) the described mentoring concept explicitly constitutes just one part of an overall career-development concept. Depending on the programme, for example, research placements, methodology courses, workshops and/or seminars are also possible.

**Structure and duration of programme**

In five of the nine programmes for students, a one-to-one ratio between mentor and mentee is striven for (Lemon et al., 1993; Gonzales et al., 1998; Abernethy, 1999; Frishman, 2001; Haq et al., 2002). One of the two setups for group mentoring takes place in the peer group (Slockers et al., 1981). Here, the mentees are first-year students, and the mentors second- to fourth-year students. With the other setup, faculty members act as mentors for students of different years (Kalet et al., 2002). In one programme, both group and individual mentoring are possible (Woessner et al., 1998). One setup includes so-called dual mentoring (two permanent mentors per mentee) (Forrow & Wolf, 1998).

Only three programmes provide for specific training to prepare the mentors for their job (Slockers et al., 1981; Lemon et al., 1995; Abernethy, 1999). The process of matching mentors with mentees is not explained in greater detail.

Most of the programmes mentioned have existed for several years. The period of participation is usually between 6 months and 3 years. Up to the time of publication, several years of mentees have already been through the programme in most cases. Thus, a programme calculated to run for 6 months in each instance has been in place for 14 years (Slockers et al., 1981). It should be noted that one programme to date has had to be suspended for financial and administrative reasons (Abernethy, 1999). Another programme has now been declared obligatory for all students, which no longer complies with the criteria of mentoring per se (Lemon et al., 1995).

**Formal mentoring programmes for doctors (Table 2)**

**Participants**

**Mentees.** Of the seven programmes for doctors remaining in the evaluation, two are from Canadian (Mahood et al., 1994; Nasmith et al., 1997) and five are from American institutions (Morzinski et al., 1996; Jogerst et al., 1998; Johnson et al., 1998; Markakis et al., 2000; Pechura, 2001), none from Europe. Here, one publication describes a comprehensive further-training project for Russian doctors in the USA in which mentoring represents a partial aspect (Jogerst et al., 1998). Four programmes are geared to further training in medical specializations (Mahood et al., 1994; Morzinski et al., 1996; Nasmith et al., 1997; Markakis et al., 2000). Here, three programmes involve further training in general practice (Mahood et al., 1994; Morzinski et al., 1996; Nasmith et al., 1997), one in internal medicine (Markakis et al., 2000). In two of the setups, the mentees are doctors belonging to ethnic minorities (Johnson et al., 1998; Pechura, 2001).

**Mentors.** Only doctors take on mentoring tasks. These are subjects with management responsibilities, or who work as researchers.
<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Country</th>
<th>Year</th>
<th>Duration of programme</th>
<th>Mentoring model</th>
<th>Participants</th>
<th>Goal</th>
<th>Evaluation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slockers et al., 1981</td>
<td>Netherlands</td>
<td>1981</td>
<td>6 months each, running for 14 years</td>
<td>Peer-mentoring</td>
<td>Mentees: 1st year students&lt;br&gt;Mentors: 2nd –4th year students</td>
<td>Introduction to everyday student life</td>
<td>Questionnaires</td>
<td>Generally high level of satisfaction&lt;br&gt;Improvement of communication skills and learning in groups</td>
</tr>
<tr>
<td>Lemon et al., 1995</td>
<td>USA</td>
<td>1995</td>
<td>3 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: 1st–3rd year students&lt;br&gt;Mentors: Family doctors, paediatricians</td>
<td>Training in primary care</td>
<td>Questionnaires, Interviews, Meetings</td>
<td>Great interest shown by students</td>
</tr>
<tr>
<td>Forrow &amp; Wolf, 1998</td>
<td>USA</td>
<td>1998</td>
<td>1 year, running for 7 years</td>
<td>Dual mentorship: 2 mentors per mentee</td>
<td>Mentees: health professional students&lt;br&gt;Mentors: Doctors, nurses, social workers</td>
<td>Humanistic and professional education, cooperation of different professional groups, networking, health care for underprivileged, organization of symposia</td>
<td>Written reports at the end of every year by all participants</td>
<td>Improvement of group cohesion and peer support&lt;br&gt;Higher number of working hours for underprivileged people</td>
</tr>
<tr>
<td>Gonzales et al., 1998</td>
<td>USA</td>
<td>1998</td>
<td>3 years, running for 7 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: 1st year students interested in primary care&lt;br&gt;Mentors: Researchers in primary care</td>
<td>Collaboration in the mentor’s research project, training in research methodology, research placements, financial support</td>
<td>No details given</td>
<td>Increase in the number of publications and talks</td>
</tr>
<tr>
<td>Woessner et al., 1998</td>
<td>Germany</td>
<td>1998</td>
<td>2 years</td>
<td>One-to-one and group mentoring</td>
<td>Mentees: students of different years&lt;br&gt;Mentors: Faculty staff</td>
<td>Shared leisure activities, development of personal contact, counselling on career-relevant issues</td>
<td>Questionnaires</td>
<td>High level of satisfaction (85%), all mentees wanted to extend the duration of the programme</td>
</tr>
<tr>
<td>Abernethy 1999</td>
<td>USA</td>
<td>1999</td>
<td>2 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: 1st–2nd year minority students&lt;br&gt;Mentors: Non-minority faculty staff</td>
<td>Preparation for clinical training&lt;br&gt;Bicultural support</td>
<td>Questionnaires, Interviews, Evaluation of the mentees by their mentors</td>
<td>Better preparation for clinical work&lt;br&gt;Satisfaction with the meetings greater for mentors than for mentees</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Country</th>
<th>Year</th>
<th>Duration of programme</th>
<th>Mentoring model</th>
<th>Participants</th>
<th>Goal</th>
<th>Evaluation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frishman, 2001</td>
<td>USA</td>
<td>2001</td>
<td>6 months each, running for 13 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: 4th year students Mentors: Researchers</td>
<td>Collaboration on the mentor's research project</td>
<td>Questionnaires</td>
<td>Improvement in dealing with medical literature Upgrading of computer knowledge High level of satisfaction Desire for a scientific career in one-third of the mentees</td>
</tr>
<tr>
<td>Hag et al. 2002</td>
<td>USA</td>
<td>2002</td>
<td>4–5 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: 1st–2nd year students interested in the care of social fringe groups Mentors: Primary care doctors cooperating with these social services</td>
<td>Development of leadership qualities Conducting a research project Building a social network</td>
<td>Not described</td>
<td>High satisfaction</td>
</tr>
<tr>
<td>Kalet et al. 2002</td>
<td>USA</td>
<td>2002</td>
<td>2 years</td>
<td>Group mentoring</td>
<td>Mentees: 1st–2nd year students Mentors: Faculty staff members</td>
<td>Development of understanding of principles and nature of the medical profession Getting to know highly motivated and qualified scientists</td>
<td>Questionnaires Focus group interviews</td>
<td>Programme taken up enthusiastically Model for reflection on one's professional career</td>
</tr>
</tbody>
</table>
Table 2. Mentoring programmes for doctors (listed by year of publication).

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Country</th>
<th>Year</th>
<th>Duration of programme</th>
<th>Mentoring model</th>
<th>Participants</th>
<th>Goal</th>
<th>Evaluation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahood et al., 1994</td>
<td>Canada</td>
<td>1994</td>
<td>2 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: Primary care trainees</td>
<td>Working out a traineeship contract, Timely recognition of training gaps</td>
<td>Analysis of plans and conversations, Simulated tests, Set of questionnaires</td>
<td>Danger of increasing workloads for mentors, Need for a mentoring course, Programme also experienced as anxiety-producing, Development of academic competence, Personal growth, Joint projects improve the success of the mentor-mentee relationship</td>
</tr>
<tr>
<td>Morzinski et al., 1996</td>
<td>USA</td>
<td>1996</td>
<td>6 months</td>
<td>One-to-one mentoring</td>
<td>Mentees: Primary care trainees, Mentors: Faculty staff members</td>
<td>Training in primary care, Academic career</td>
<td>Questionnaires, Semi-structured interviews</td>
<td>Communication made more difficult for mentees, improved for mentors, Main problems: time unnaturally of the contract, lack of flexibility of meetings, no opportunity to choose one's mentor</td>
</tr>
<tr>
<td>Nasmith et al., 1997</td>
<td>Canada</td>
<td>1997</td>
<td>2 years</td>
<td>One-to-one mentoring</td>
<td>Mentees: Primary care trainees, Mentors: Faculty staff members</td>
<td>Traineeship contract, Discussion of the aims of training, Career planning, Improvement of communication, Timely recognition of problems</td>
<td>Questionnaires, Evaluation of the traineeship contracts</td>
<td>Increase in capabilities, skills and knowledge (data)</td>
</tr>
<tr>
<td>Jogerst et al., 1998</td>
<td>USA</td>
<td>1998</td>
<td>6 months</td>
<td>One-to-one mentoring</td>
<td>Mentees: Primary care trainees from Russia, Mentors: Faculty staff members of an American university</td>
<td>Provision of specialist knowledge, investigative techniques, economic knowledge, teaching skills</td>
<td>Questionnaires, Exams, Written assessment of the mentees by their mentors</td>
<td>Reduction of costs (concrete figures)</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>Ref.</th>
<th>Country</th>
<th>Year</th>
<th>Duration of programme</th>
<th>Mentoring model</th>
<th>Participants</th>
<th>Goal</th>
<th>Evaluation</th>
<th>Results</th>
</tr>
</thead>
</table>
| Johnson et al., 1998 | USA | 1998 | Up to several years | One-to-one mentoring | Mentees: Ethnic minority doctors  
Mentors: Minority faculty members | Increasing the number of ethnic-minority faculty staff  
Provision of skills for research, grant funding, teaching and publishing | Evaluation of number of publications, research grants and talks | Increased numbers of ethnic-minority faculty staff |
| Markakis et al., 2000 | USA | 2000 | 3 years, running for 10 years | One-to-one mentoring | Mentees: Domestic and foreign doctors in specialist training of internal medicine  
Mentors: Faculty staff members | Acquisition of professional and humanistic knowledge  
Personal growth  
Discussion of individual strengths and weaknesses  
Working out of realistic goals  
Identification of resources  
Time management | Feedback from the mentees  
Pointing out of the mentees' progress by mentors at a monthly meetings | Great progress for mentees  
Mentor as protection in difficult times |
| Pechura 2000 | USA | 2001 | 4 years, running for 19 years | One-to-one mentoring | Mentees: Specialist trainees from ethnic minorities interested in research, with the aim of subspecialisation and an academic career (70% research activity)  
Mentors: Specialist doctors and researchers | Academic career for members of ethnic minorities | Two external experts | Example of a mentee that became an expert  
Recommendation of continuation of the programme |
For the mentees currently undergoing specialist training, it is mostly individual goals, strategies and methods with respect to earning their specialist qualification that are meant to be worked on in the mentoring relationship. In the two Canadian programmes, this is stipulated and meant to be worked on in the mentoring relationship. In respect to earning their specialist qualification, for the mentees, mostly individual goals, strategies and methods with respect to their specialist qualification are meant to be worked on in the mentoring relationship.

Short- and long-term aims
For the mentees currently undergoing specialist training, it is mostly individual goals, strategies and methods with respect to earning their specialist qualification that are meant to be worked on in the mentoring relationship. In the two Canadian programmes, this is stipulated and meant to be worked on in the mentoring relationship. In respect to earning their specialist qualification, mostly individual goals, strategies and methods with respect to their specialist qualification are meant to be worked on in the mentoring relationship.

Structure and duration of programme
In all seven programmes for doctors, there is a one-to-one ratio between mentor and mentee. The possibility of the mentor supervising several mentees at a time is mentioned in three papers (Mahood et al., 1994; Nasmith et al., 1997; Pechura, 2001). As with the students, in three of the programmes for doctors, mentoring is explicitly just one part of an overall setup for career development (Jogerst et al., 1998; Johnson et al., 1998; Pechura, 2001). Depending on the programme, for example, research placements, methodology courses, workshops and/or seminars are also offered.

A 19-year-old programme, designed for the long term, for the progressive career development of members of ethnic minorities, runs from a university-studies preparation course for high school students to the conclusion of their academic careers (Johnson et al., 1998). However, mentoring is provided solely for the participating doctors in support of their research activity and hence the building of their academic careers. Unlike the programmes for students, the doctors’ programmes provide no specific training for mentors; nor is the matching process described in much detail in the doctors’ projects.

Most of the programmes mentioned have been running for several years. The period of participation is usually between 2 and 4 years.

Results of the evaluation of all 16 programmes
The presented results of the programmes are mostly descriptive in terms of a great interest in the offering in question, or a high level of satisfaction among all participants. Percentage figures on satisfaction (80–90%) are given in two papers (Woessner et al., 1998; Frishman, 2001). Further generally formulated results are: Improvement in communication and learning in the group (Stockers et al., 1981), and progress in dealing with specialist literature and computers (Frishman, 2001). Concrete figures on the number of papers published and lectures/papers given at conferences as a result of a mentoring programme for students interested in research (but without comparison-group figures) are only given in one paper (Gonzales et al., 1998). As long-term successes are reported: A rise in the number of members of ethnic minorities among all faculty members as a consequence of specific mentoring over 4 years (Johnson et al., 1998); and an exemplary report of a former mentee who developed into an international expert (Pechura, 2001).

Three programmes for doctors in specialist training also report on concrete problems with mentoring: Danger of a fairly large time demand being placed on mentors (Mahood et al., 1994); anxiety caused by the constant checking of the mentees by the mentors (Mahood et al., 1994), and as a result, the danger of a worsening of communication between mentors and mentees (Nasmith et al., 1997); difficulties arising from an insufficiently flexible mentor-mentee relationship (Nasmith et al., 1997); a too large geographical distance between mentor and mentee (Morzinski et al., 1996).

Effectiveness and efficiency of the mentoring programmes
Only three of the 16 programmes examined contain statements on the (partial) costs accruing (Jogerst et al., 1998; Johnson et al., 1998; Pechura, 2001). Financial support for the mentees in the form of grants and/or research funds is mentioned in three setups (Forrow & Wolf, 1998; Gonzales et al., 1998; Haq et al., 2002). The fact that mentors receive no financial compensation is stressed in two publications (Lemon et al., 1995; Woessner et al., 1998).

No publication contains statements on the effectiveness (efficacy of the measures) or the efficiency (cost-effectiveness, or the ratio between money spent and success) of the programme.

Discussion
Only 16 of 162 publications identified by the chosen search strategy met the inclusion criteria and were accepted in the final evaluation. Among these are nine mentoring programmes for medical students and seven for doctors. Tables 1 and 2 clearly show that none of these papers give detailed information about all of the eight classified features of the individual projects. Details on the number of participating mentors and mentees, the method and the results of the scientifically founded and longer-term evaluation are frequently missing.

Models of mentoring programmes
In the programmes for doctors, the mentee–mentor relationship is set up on a one-to-one basis; in those for medical students, different schemes are established, including peer (Stockers et al., 1981), group (Woessner et al., 1998; Kalet et al., 2002) and individual mentoring (Lemon et al., 1995; Gonzales et al., 1998; Woessner et al., 1998; Abernethy, 1999; Frishman, 2001; Haq et al., 2002). One can assume that mentoring for doctors must be more stage-specific and goal-oriented for the individual mentee, whilst mentoring for students is also effective addressing a group of mentees at the same training stage. The duration of the programmes both for students and doctors varies a lot. In most of the papers whether the mentees participate in a...
temporally circumscribed programme or the mentoring is a slow open process is not mentioned.

Short- and long-term goals

Only some programmes are geared specifically to the mentored support in the building of an academic and research career (Morzinski et al., 1996; Johnson et al., 1998; Pechura, 2001). Those programmes for students, which impart special research knowledge might contribute to a later academic career (Gonzales et al., 1998; Frishman, 2001; Haq et al., 2002). Most of the reported programmes either aim to stimulate students’ interest in a certain medical specialty, mainly primary care (Lemon et al., 1995; Gonzales et al., 1998), or as a matter of help and support in earning their specialist degree (Markakis et al., 2000; Pechura, 2001).

Short- and long-term successes

In general terms, mentoring leads to the expansion and consolidation of the mentees’ professional and social skills. This also includes increased self-confidence, improved communication skills and more know-how in dealing with computers and specialist literature. Each of the included papers assumes the ‘success’ of their programme; but this term is not defined. Moreover, the method of measuring success has not been standardized. Some of the programmes suggest that a competitive process for admission to the programme and/or a high participation rate should be judged as a success (Stockers et al., 1981). Furthermore, the project seems to be viewed as successful if, according to survey results, the majority of mentees and mentors feel that they have gained personally from participation, and would take part in the programme again (Nasmith et al., 1997; Woessner et al., 1998; Frishman, 2001). Here, the social desirability effect might come into play.

Evaluation of long-term successes after participation in a mentoring programme is still to come. That mentoring alone does not make a career possible is clear from the fact that in three projects (Gonzales et al., 1998; Johnson et al., 1998; Haq et al., 2002), the mentoring programme explicitly only constitutes part of an overall career-development concept. The long-term successes are usually identified for the programme per se, and less for the individual participants (Johnson et al., 1998). Interestingly, no statements are to be found on the advantages of a mentoring programme for the mentors.

Difficulties in the mentoring process

Three of the 16 programmes report on disadvantages and risks for the participants (Mahood et al., 1994; Morzinski et al., 1996; Nasmith et al., 1997). The effect is negative if the mentor–mentee relationship was not chosen voluntarily, or if the evaluation of the mentoring is carried out by mentors who must also simultaneously qualify the mentees. Here, interests and dependencies become entangled.

Statements on the effectiveness and efficiency of the programme are not described in any of the publications. Jogerst et al. (1998) are the only ones to report on the economic aspects of the programme (structured and specific further training of five Russian general practitioners).

Limitations

The present literature review is limited to papers published in Medline. The purpose of the review was to look for scientific papers dealing with mentoring programmes for medical students and doctors, not for other health professionals. Abstracts and conference proceedings often report only work in progress.

Conclusion

Despite the fact that formal mentoring programmes have been acknowledged to be of great importance for the career support and promotion of junior physicians, there are not many papers published which give satisfying details on the various elements of such a programme. There is a need of a better evaluation.

The results of the programmes examined confirm that career development should for the most part be stage-specific and goal-oriented. It is precisely the long-standing programmes for comprehensive career advancement from (pre-) course of study to the academic career, that are able to offer a long-term, sustainable contribution to career development. Although there are some encouraging results and the presumable effect of mentoring is to be deemed highly promising, there are a series of unanswered questions on formal mentoring for medical students and doctors. Of particular interest here are the individual successes of participants over a fairly long period, as well as the cost-benefit analysis. A long-term study comparing the career courses of people with and without formal mentoring would also be of interest.

Notes on contributors

BARBARA BUDDEREG-FISCHER, MD Professor, is a senior psychiatrist and psychotherapist, a senior researcher and lecturer at the Department of Psychosocial Medicine at the University of Zurich, Switzerland. Her main research topics are eating disorders and gender issues in medicine. She heads a mentoring-programme for junior physicians at the university hospital Zurich since 2002. First evaluation results are published: Buddeberg-Fischer B, Vetsch E, Mattanza G (2004) Career support in medicine: experiences with a mentoring program for junior physicians at a university hospital. http://www.egms.de/en/journals/psm/2004-1/psm000004.shtml

KATJA-DANIELA HERTA, MD, is a senior psychiatrist and psychotherapist at the psychiatric hospital Zurich. Her main interests are gender issues in medicine.

References

ABERNETHY, A. (1999) A mentoring program for underrepresented-minority students at the University of Rochester School of Medicine, Academic Medicine, 74, pp. 356–359.


