

# Formal mentoring programmes for medical students and doctors – a review of the Medline literature

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**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

### 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.

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

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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 (Slockers *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 (Slockers *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.*, 1995; 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 1.** Mentoring programmes for medical students (listed by year of publication).

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

(Continued)

Table 1. Continued.

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

**Table 2.** Mentoring programmes for doctors (listed by year of publication).

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

(Continued)

Table 2. Continued.

Ref.	Country Year	Duration of programme	Mentoring model	Participants	Goal	Evaluation	Results
Johnson <i>et al.</i> , 1998	USA 1998	Up to several years	One-to-one mentoring	<i>Mentees:</i> Ethnic minority doctors <i>Mentors:</i> 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 <i>et al.</i> , 2000	USA 2000	3 years, running for 10 years	One-to-one mentoring	<i>Mentees:</i> Domestic and foreign doctors in specialist training of internal medicine <i>Mentors:</i> 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 Academic career for members of ethnic minorities	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	<i>Mentees:</i> Specialist trainees from ethnic minorities interested in research, with the aim of subspecialisation and an academic career <i>Mentors:</i> Specialist doctors and researchers		Two external experts	Example of a mentee that became an expert Recommendation of continuation of the programme

*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 examined by means of a contract concluded between mentor and mentee (Mahood *et al.*, 1994; Nasmith *et al.*, 1997). Two publications state the support of members of ethnic minorities in their academic careers as an aim of the mentoring programme (Johnson *et al.*, 1998; Pechura, 2001). Both programmes are designed as a comprehensive career-support measure and serve to develop research competencies (Pechura, 2001) as well as to provide publication and teaching skills (Johnson *et al.*, 1998). This is meant to increase the proportion of ethnic-minority faculty members over the long run.

*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 (Slockers *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 (Slockers *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 (Slockers *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**

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