Contribution of medical student research to the Medline™-indexed publications of a German medical faculty

Claus Cursiefen & Ayhan Altunbas
Julius-Maximilians-University of Würzburg, Medical Faculty, Würzburg, Germany

SUMMARY
Medical students in Germany have to write a research thesis to acquire the title of medical doctor. This study evaluates the contribution of student research to the Medline™-indexed publications of a German medical faculty. A 1993–1995 Medline™-publication list, on which medical students among authors should be marked, was sent to medical faculty staff of the University of Würzburg, Germany (n = 238). Faculty members responded (106, 45%), 66 were working at a clinic, 26 at a clinic-associated institute and 14 at a basic science institute. Between 1993 and 1995, 1128 Medline™-indexed papers were published by these faculty members, who on average supervised 4.5 medical students (n = 477). Medical students were among the authors of 316 (28%) and were the first authors of 88 papers (7.8%). For 66% of medical students their research resulted in a Medline™-indexed publication. Medical student research activity can significantly influence the published output of a medical faculty.

Keywords
*Faculty; Germany; Medline; research; students, medical

BACKGROUND
According to a survey by Stimmel (1976) most medical students and Faculty members agree that ‘research, either of a basic science or a clinical nature, is helpful in preparing all students for the practice of medicine, regardless of ultimate career choice’. Open questions are how this should be implemented in the medical curriculum, how much time should be reserved for this and whether research should be mandatory or on an elective basis (Cursiefen et al. 1995). Regarding the pros and cons of voluntary and mandatory medical student research activity, a lot of questions are also open. Two models of student research activity coexist: voluntary, as in the USA or Britain, and ‘mandatory’, as in Germany. In Germany medical students have to perform research to acquire the qualification of ‘medical doctor’, whereas research activity is voluntary for example in the USA or Britain (Cursiefen et al. 1995). About 70% of German medical students perform research during their course or during internship (Minks & Bathke 1994). Here we tried to find out how ‘mandatory’ medical student research activity contributes to the published scientific output of the medical faculty of the University of Würzburg, Germany, as an example. With 3000 medical students (1995) the medical faculty of the University of Würzburg is a medium-sized medical faculty among the 36 German medical faculties with an overall number of 80 000 medical students (1995).

METHODS
A 1993–1995 Medline™-publication list was sent to medical faculty staff of the University of Würzburg, Germany, one of 36 medical faculties in Germany. The Faculty consisted of 50 heads of department, 66 full professors and 122 assistant professors (n = 238). In 1995, 3000 medical students were enrolled in the medical faculty. Members of the Faculty were asked to mark the authors on the publication list who were medical students at the time of performing the research. Articles involving authors from different institutions were attributed to the institute where the first author was located. Publication lists were evaluated anonymously, divided into the three groups of clinic, clinic-associated institute and basic science institute. To obtain objective and comparable data we only included Medline™-indexed journals in our literature list.

RESULTS
From the 238 1993–1995 Medline™-publication lists that were sent to all members of the medical Faculty of
the University of Würzburg and on which all medical students among authors should be marked, 106 questionnaires were returned (45%). Sixty-six of these faculty staff members (62.3%) were working at a clinic, 26 (24.5%) at a clinic-associated institute and 14 (13.2%) at a basic science institute. Every Faculty member supervised 4.5 medical students doing their research theses \( (n = 477) \) on average. Between 1993 and 1995, 1128 papers indexed in Medline\textsuperscript{TM} were published by these 106 teachers, 708 (62.8%) from clinics, 242 (273) from clinic-associated institutes and 147 (13%) from basic science institutes. The publication effort from these three groups did not vary if corrected for the number of Faculty members located there. Medical students were among the authors of 316 papers (28%). In 7.8% of the Medline\textsuperscript{TM}-indexed articles a medical student was the first author \( (88) \). The percentage of medical students as first authors was slightly higher in basic science institutes (10.2%) and clinic-associated institutes (10.3%) compared to clinics (6.3%), whereas the overall student participation was quite similar in all three groups: 28% in clinics, 25.7% in clinic-associated institutes and 29.9% in basic science institutes. For 66% of medical students their research work resulted in a Medline\textsuperscript{TM}-indexed publication.

**DISCUSSION**

Generally two models of medical student research activity coexist: voluntary, as in Britain or in the USA, or ‘mandatory’, as in Germany (Altunbas \& Cursiefen 1998). Nowadays about 70% of German medical students perform research during their course or internship (Minks \& Bathke 1994). Of all practising German doctors, 90% have performed research and are allowed to hold the academic title medical doctor ‘Dr Med’ (Cursiefen \textit{et al.} 1995). In this study we tried to find out whether and how much mandatory student research activity as in Germany contributes to the published scientific output of a medical faculty. At the University of Würzburg medical students participated in 28% (316) of the Medline\textsuperscript{TM}-indexed papers published between 1993 and 1995 at the University of Würzburg by the 106 Faculty members who replied to our survey. Medical students were the first authors of 7.8% of the articles. The high contribution of medical students to published papers reflects their impact on the work preceding the publication. It has to be borne in mind that most results of medical student research are first presented at national or international meetings, where abstracts may be published which are not included in Medline\textsuperscript{TM}. In addition some amount of work will be published in German, non-indexed journals. Overall the contribution of medical student research activity to the research activity at a German university hospital is probably higher than the 28% suggested. On the other hand, 28% does not say anything about the time, ideas, funding, etc., invested in the presented studies; most of the medical students work under supervision and perform established methods in a pre-existing scientific setting. A recent survey from Stanford University, where about 90% of students of one year performed voluntary research during their course, showed that this resulted in at least one published paper for 75% and a presentation at a national meeting for 52% of students (Jacob \& Cross 1995). In this study 66% of medical students obtained a Medline\textsuperscript{TM}-indexed publication from their research work. The University of Würzburg is a medium-sized and representative German medical school with an overall number of just above 3000 medical students (1995). This study shows that ‘mandatory’ medical student research activity does not only provide an opportunity for students to develop an investigative approach to medical problems but can also contribute substantially to the research activity and the published scientific output of a medical faculty. This is of special interest in the light of the current discussion about allocating funds in the health system and the different scientific wealth of industrialized nations (Culliton 1997; May 1997).

**REFERENCES**


Received 2 April 1998; accepted for publication 7 April 1998

\textsuperscript{©} 1998 Blackwell Science Ltd