

Int Poster J Dent Oral Med 2009, Vol 11 No 4, Poster 464

## Evidence-based medicine in dental tertiary education

**Language:** English

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**Date/Event/Venue:**

05.-07.03.2009  
10. Jahrestagung des Deutschen Netzwerks Evidenzbasierte Medizin  
Berlin

### Introduction

The medical Licensure Act schedules to train the future dentist in practical skills as well as science-based. Continuously increasing numbers of students cause considerable difficulties in the students' practical training. Data concerning the scientific part of their education are hardly charged. Most dental students in Germany pass their final examinations without having attended lectures or courses on medical statistics, epidemiology or biometrics.

### Objectives

As many homepages and university calendars do not give information on the integration of evidence-based medicine (EbM) into the education, a questionnaire was sent to the ordinaries and their senior physicians of the 30 german universities where dental education is possible.

Twenty of the 30 universities sent back the questionnaire. As each university consists of 4 to 5 departments, a return of 37 questionnaires altogether is very marginal.

It is remarkable that in 31 of the 37 returned questionnaires it is specified that EbM has become part of the students' education.

### Material and Methods

The above mentioned questionnaire comprised inter alia questions whether the issue of EbM is broached in lectures or courses, what forms of examination are used, which training the teachers have and what they think are the advantages and disadvantages of integrating EbM in the students' education.

### Results

### Returned questionnaires

Twenty of the 30 universities sent back the questionnaire. As each university consists of 4 to 5 departments, a return of 37 questionnaires altogether is very marginal.

It is remarkable that in 31 of the 37 returned questionnaires it is specified that EbM has become part of the students' education. Hypothesis: Basically those answered who have self-interest in EbM and therefore implement it in their lectures and/or courses.

### Identification of EbM lectures/Courses in the university calendar

Only in five cases it is obvious that EbM is part of a lecture or a course.

Twenty-nine departments answered that it cannot be identified in their university calendar, five made no specification.

### Training of the teachers

Twenty-five teachers answered that they acquired knowledge through the reading of publications and EbM-books.

Fifteen of all teachers attended one or more courses to become acquainted with EbM. Four teachers were already educated in EbM-skills during their time as student.

Also graduates of Health-Care-Studies or the like are teachers for dental students.

### Integration in lectures/seminars/courses

The integration of EbM into a lecture was specified by 31 departments. Five of them have started before the year 2000, 27 of them after 2000, four made no specification.

Six departments stated that their students do not get to know currently what EbM means.

In 16 departments the students learn about EbM in practical courses. Three of them started before 2000, nine afterwards, three made no specification, one course was adjusted in 2006. In 21 departments EbM is no part of a course or a seminar.

### Examination of knowledge

In 16 lectures or courses EbM is part of the education but the students' knowledge is not tested in any way.

Five of the 16 lectures/courses end with a written test.

In four lectures/courses EbM is taught in theory and practically but there is no test at the end.

Eight lectures have theoretical and practical education with a written test at the end of the course.

The above mentioned sum of 33 teaching activities is realistic as all departments offer more than one lecture/course for their students.

### Extra-curricular activities

11 departments offer their students to attend extra-curricular lectures/seminars or courses to learn about the basic principles of EbM.

One department adjusted this opportunity.

Two departments have started those activities before the year 2000, the other nine departments afterwards.

In a few (7) courses/lectures the students are taught theoretically only and they have no examination at the end of the lecture/course. Others (4) train in theory as well as practically and have a written test at the end of the lecture/course.

### Alternative to attend human-medicine-courses in medical statistics, biometrics or others

Sixteen departments stated that their dental students have the chance to attend courses in statistics, biometrics or others which are usually offered to students of human medicine only. Five departments negated this, one department made no specification.

But differences were obvious: While in many cases one department of a university approved this question, other departments negated or made no specification.

### Advantages

The questionnaire contained three standard phrases with regard to the advantages of EbM. Of these chose:

30: "EbM encourages students to think critically and analyze."

11: "EbM helps the students to integrate the art with the science of medicine."

22: "Supportive of EbM teaching."

Further comments: "Educates the students to come to structured decisions."

"EbM encourages/makes the students to read English written papers."

"How can clinical procedures be introduced or advised without knowing them to be evidence-based?"

### Disadvantages

For the disadvantages as well, three standard phrases were given:

5: "More emphasis should be given to students gaining clinical experience."

5: "Lack of support from other colleagues."

11: "Clinical tutors need more training in teaching EbM."

Further comments (samples): "Searching for literature takes time. Time that is not scheduled in the curriculum."

"In the daily clinical routine there is hardly time left to prepare the scheduled lectures etc. - beside patient care, research and administrative duties."

"Teaching EbM is sometimes very difficult because of missing biostatistical basics."

"There is no interest from the students to alternate with EbM."

### Further results

Two of the above specified lectures/courses are held in English.

Two universities advise their students of EbM during the first five terms. The questionnaire could not ascertain how it is implemented and how knowledge is tested in these cases.

## **Conclusions**

The integration of EbM into the dental students' training seems to be remarkable on the first sight. As many lectures/seminars and courses remain without consequences for the students (no test or oral exams) it can hardly be estimated whether a knowledge gain will develop on the long run.

The own training in EbM seems to be insufficient to many teachers, a lack of time to occupy oneself with EbM was complained. The statement that dental students could attend statistic-courses has to be reappraised. The authors are neither familiar with the plain opportunity nor that it is recommended to the students.

It is positive that (at least) at 20 of the 30 German universities the students get in touch with EbM during their training. EbM seems to find its ways of being integrated although further investigations for position-fixing are essential.

EbM has become part of the curriculum in some universities/departments. Education and examinations range from none to theoretically and practically.

The present questionnaire survey examined whether EbM has been implemented in the students' education at all.

A further survey should investigate in which modality the implementation takes place. The students' opinion concerning this theme would be a valuable amendment.

## **Abbreviations**

EbM = evidence-based medicine

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Aims and problems	Results	Comments of the teachers, Conclusion
<p><b>Background</b></p> <p>The Medical Licensure Act schedules to train the future dentist both in practical skills and science-based. Continuously increasing numbers of students cause considerable difficulties in the students' practical training. Data concerning the scientific part of their education are hardly charged. Most dental students in Germany pass their final examinations without having attended lectures/seminars or courses on medical statistics, epidemiology or biometrics.</p> <p><b>Development of the questionnaire</b></p> <p>As many homepages and university calendars do not give information on the integration of evidence-based medicine (EbM) into the education, a questionnaire was sent to the ordinaries and their senior physicians of the 30 german universities where dental education is possible. The questionnaire comprised inter alia questions whether the issue of EbM is broached in lectures/seminars or courses, what forms of examination are used, which training the teachers have and what they think are the advantages and disadvantages of integrating EbM in the students' education.</p> <p><b>Returned questionnaires</b></p> <p>Twenty of the 30 universities sent back the questionnaire. As each university consists of 4 to 5 departments, a return of 37 questionnaires altogether is very marginal. It is remarkable that in 31 of the 37 returned questionnaires it is specified that EbM has become part of the students' education. Hypothesis: Basically those answered who have self-interest in EbM and therefore implement it in their lectures and/or courses.</p> <p><b>Identification of EbM lectures/courses in the university calendar</b></p> <p>Only in five cases it is obvious that EbM is part of a lecture/seminar or a course. Twenty-nine departments answered that it cannot be identified in their university calendar, five made no specification.</p> <p><b>Training of the teachers</b></p> <p>Twenty-five teachers answered that they acquired knowledge through the reading of publications and EbM-books. Fifteen of all teachers attended one or more courses to become acquainted with EbM. Four teachers had learned about EbM during their time as student. Also graduates of Health-Care-Studies or the like are teachers for dental students.</p> <p><b>Further results</b></p> <p>Two of the above specified lectures/courses are held in english.</p> <p>Two universities advice their students of EbM during the first five terms. The questionnaire could not ascertain how it is implemented and how knowledge is tested in these cases.</p>	<p><b>Integration in lectures/seminars/courses</b></p> <p>The integration of EbM into a lecture/seminar was specified by 31 departments. Five of them have started before the year 2000, 27 of them after 2000, four made no specification. Six departments stated that their students do not get to know currently what EbM means. In 16 departments the students learn about EbM in clinically integrated courses. Three of them started before 2000, nine afterwards, three made no specification, one course was adjusted in 2006. In 21 departments EbM is no part of a course or a seminar.</p> <p><b>Examination of knowledge</b></p> <p>In 16 lectures or courses EbM is part of the education but the students' knowledge is not tested in any way. Five of the 16 lectures/courses end with a written test. In four lectures/courses EbM is taught both in theory and clinically integrated but there is no test at the end. Eight lectures have both theoretical and clinically integrated education with a written test at the end of the course. The above mentioned sum of 33 teaching activities is realistic as all departments offer more than one lecture/course for their students.</p> <p><b>Extra-curricular activities</b></p> <p>Eleven departments offer their students to attend extra-curricular lectures/seminars or courses to learn about the basic principles of EbM. One department adjusted this opportunity. Two departments have started those activities before the year 2000, the other nine departments afterwards. In a few (7) courses/lectures the students are taught in theory only and they have no examination at the end of the lecture/course. Others (4) train in theory as well as clinically integrated and have a written test at the end of the lecture/course.</p> <p><b>Alternative to attend human-medicine-courses in medical statistics, biometrics or others</b></p> <p>Sixteen departments stated that their dental students have the chance to attend courses in statistics, biometrics or others which are usually offered to students of human medicine only. Five departments negated this, one department made no specification. But differences were obvious: While in many cases one department of a university approved this question, other departments negated or made no specification.</p>	<p><b>Advantages</b></p> <p>The questionnaire contained three standard phrases. Of these chose:</p> <p>30: "EbM encourages students to think critically and analyze."  11: "EbM helps the students to integrate the art with the science of medicine."  22: "Supportive of EbM teaching."  Further comments (samples): "Educates the students to come to structured decisions."  "EbM encourages/makes the students to read english written papers."  "how can clinical procedures be introduced or advised without knowing them to be evidence-based?"</p> <p><b>Disadvantages</b></p> <p>Here also, three standard phrases were given:</p> <p>6: "More emphasis should be given to students gaining clinical experience."  5: "Lack of support from other colleagues."  11: "Clinical tutors need more training in teaching EbM."  Further comments (samples): "Searching for literature takes time. Time that is not scheduled in the curriculum."  "the daily clinical routine there is hardly time left to prepare the scheduled lectures etc. - beside patient care, research and administrative duties."  "Teaching EbM is sometimes very difficult because of missing biostatistical basics."  "There is no interest from the students to alternate with EbM."</p> <p><b>Conclusion</b></p> <p>The integration of EbM into the dental students' training seems to be remarkable on the first sight. As many lectures/seminars and courses remain without consequences for the students (no test or oral exams) it can hardly be estimated whether an improvement of knowledge will develop on the long run. The own training in EbM seems to be insufficient to many teachers, a lack of time to occupy oneself with EbM was complained. The statement that dental students could attend statistic-courses has to be reappraised. The authors are neither familiar with the plain opportunity nor that it is recommended to the students. It is positive that (at least) at 20 of the 30 german universities the students get in touch with EbM during their training. EbM seems to find ist ways of being integrated although further investigations for positioning are essential.</p>
<p><b>Future prospects</b></p> <p>Two of the above specified lectures/courses are held in english.</p> <p>Two universities advice their students of EbM during the first five terms. The questionnaire could not ascertain how it is implemented and how knowledge is tested in these cases.</p>	<p><b>Future prospects</b></p> <p>EbM has become part of the curriculum in some universities/departments. Education and examinations range from none to both theoretically and clinically integrated.</p> <p>The present questionnaire survey examined whether EbM has been implemented in the students' education at all. A further survey should investigate in which modality the implementation takes place. The students' opinion concerning this theme would be a valuable amendment.</p>	<p><b>Future prospects</b></p> <p>EbM has become part of the curriculum in some universities/departments. Education and examinations range from none to both theoretically and clinically integrated.</p> <p>The present questionnaire survey examined whether EbM has been implemented in the students' education at all. A further survey should investigate in which modality the implementation takes place. The students' opinion concerning this theme would be a valuable amendment.</p>