Series of Reports on European Orthodontics

The EURO-QUAL Biomed 2 Project

Original Report Series

Introduction to the Series

In 1992, the EUR-QUAL I project commenced. The project was funded by the European Commission. Its mission and objectives were 'to support the orthodontic professional in Europe in improving the quality of care'. As a result of the project, a series of policy statements on all aspects of orthodontic care were produced. In 1995, the European Commission funded the next phase of the project—EURO-QUAL II—as part of the BIOMED 2 programme. The objective of EURO-QUAL BIOMED 2 has been to develop a quality improvement system for orthodontic care. A team of orthodontists, teachers and administrators drawn from all the member states of the European Union plus Norway, Albania, Bulgaria, the Czech Republic, Hungary, Latvia, Poland, and Slovenia was formed to work towards fulfilling the objective. The team divided into six groups (Quality Manual, Data Base, Industrial Cooperation, Consumer Satisfaction, Financial Resources, and Professional Development), each of which has worked on an aspect of quality improvement.

The Professional Development Group (PDG) consisted of:

Professor J. P. Adamidis	(Professor of Orthodontics, University of Athens)
Mr K. A. Eaton	(Honorary Senior Research Fellow, Eastman Dental Institute for Oral Health Care Sciences, University of London and Group Leader)
Mr J. P. McDonald	(Consultant, Centre for Postgraduate Dental Education, University of Edinburgh)
Dr H. Seeholzer	(Specialist Orthodontist, Erding, Germany)
Dr B. Sieminska-Piekarczyk	(Head of the Department of Orthodontics, The Medical University of Warsaw)

In March 1996, PDG was tasked with formulating guidelines, which could be accepted throughout Europe, with a view to harmonizing the quality and content of the different educational programmes in all aspects of orthodontics in Europe.

The PDG reviewed the published literature on all aspects of orthodontic training and education in Europe, and produced a series of brief position papers, which were circulated to all other members of the EURO-QUAL BIOMED II project for comments. It was concluded that there was insufficient information on current training programmes and practices for many countries. It was therefore decided to carry out surveys to assess aspects of the following topics:

1. Undergraduate orthodontic education.
2. Postgraduate (specialist) orthodontic education, assessment and examinations.
3. Continuing professional education in orthodontics.
4. Orthodontic auxiliary training.
5. Current problems in orthodontic training at all levels.

The PDG designed questionnaires on these five topics and piloted them within the group. The questionnaires were then distributed to all members of the EURO-QUAL BIOMED II project and/or orthodontic teachers from countries not represented, together with an explanatory letter. Responses were obtained from all member states of the European Union (EU) and from all countries with project team members.

The responses were validated by the members of the PDG with the respondents, either in person, during the March 1998 meeting of members of the EURO-QUAL BIOMED II project when the authors were able to interview the majority of the respondents in person, or by further correspondence with those who did not attend the meeting.

In the U.K., a solely postal questionnaire on dental education had a poor response rate (Vaughan, 1992). There were over 130 dental schools in the 15 countries of the European Union and a further 40 in the other 13 European countries involved in the EURO-QUAL BIOMED II project. A recent questionnaire survey of EU dental schools reported a 23 per cent response to a questionnaire (Shanley *et al*., 1997) and anecdotal evidence suggested similar response levels to similar questionnaires in the past. As stated in the previous paragraph, it was therefore decided to distribute the questionnaires only to members of the EURO-QUAL BIOMED II project or to identified orthodontic teachers from the 28 countries and not to send them to all 170 dental schools in the 28 countries. It was appreciated that this approach ran the risk that respondents could give answers which related only to their own dental schools, rather than to their country as a whole. To minimize this risk, the validation exercise, in which respondents were asked to confirm that as far as possible the answers they had given were true for their countries as a whole, rather than just for their own schools, was performed. Validated responses to four of the five questionnaires were received from 23 countries: Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Validated responses were received from 22 countries (there was no response from Slovakia) to the questionnaire on orthodontic auxiliary training. It was not possible to validate the responses received from a further five countries: Croatia, Estonia, Latvia, Lithuania, and Romania. Data from these five countries are therefore not presented in the series of papers which follow this introduction.

The PDG formulated suggested guidelines, in the light of the information gathered. These guidelines cover all the

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topics listed above with the exception of 'current problems'. However, although not the topic of a questionnaire, it was felt that guidelines should be suggested on 'communication skills' as within the group there was unanimous agreement that they were generally badly taught or not taught at all, and are critical to all aspects of orthodontic education and the provision of orthodontic care.

The draft guidelines and the results of the questionnaires were circulated to all members of the EURO-QUAL BIOMED II project and to a wide range of European national and international bodies involved in the provision, funding, and organization of orthodontic education and training for comment. They have undergone amendment in the light of these comments.

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A Survey of Undergraduate Orthodontic Education in 23 European Countries

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Abstract. *This paper reports on a survey of teaching contents and time allocation within the undergraduate orthodontic curriculum in European countries in 1997, and on whether or not these countries set a formal undergraduate examination in orthodontics. A questionnaire and an explanatory letter were mailed to all members of the EURO-QUAL BIOMED II project. Answers were validated during a meeting of project participants and by fax when necessary. Completed questionnaires, which were subsequently validated, were returned by orthodontists from 23 countries. They indicated that orthodontics was taught in all undergraduate curriculums of the countries surveyed. The number of hours in the undergraduate curriculum devoted to orthodontics was reported as varying from 135 to 500 hours with a mean of 245 hours. The time reported as allocated to theory, clinical practice, laboratory work, diagnosis, and treatment planning varied widely. In general, clinical practice and theory were reported as being allocated most curriculum hours, whilst diagnosis, laboratory work, and treatment planing were reported as receiving relatively less time. Removable appliances were reported to be taught in 22 of the 23 countries, functional appliances in 21 countries and fixed appliances in 17 countries. An undergraduate examination in orthodontics was reported by 20 countries. It was concluded that orthodontics occupies a small proportion of the undergraduate curriculum in dentistry in most countries, the emphasis is on theory and clinical work, and that removable appliances, functional appliances, and certain aspects of fixed appliances are taught in the majority of countries that responded to the questionnaire.*

Index words: European, Survey, Undergraduate Orthodontic Education.

Introduction

As described in the general introduction, this survey was one of a series of five carried out by the Professional Development Group of the EURO-QUAL BIOMED II project (ter Heege, 1997), in order to establish a baseline of up to date information, prior to the formulation of guidelines for all aspects of orthodontic education in Europe (Prahl-Andersen and ter Heege, 1995).

In the USA, the American Dental Association requires that dental students are taught clinical orthodontic procedures. The American Dental Association accreditation guidelines state that 'graduates must be competent to recognize malocclusion in the primary, mixed, and permanent dentition and treat limited developmental and acquired abnormalities' (Behrents and Keim, 1991).

In contrast, to date in Europe, there are no such guidelines for undergraduate orthodontic education and furthermore there is no common curriculum. Even though a substantial diversity exists in the length, intensity, and contents of existing undergraduate orthodontic curriculums, the relevant EC Training Directive (78/686/EEC) allows freedom for European Union (EU) qualified dentists to establish practice within any of the Member States of the EU, and considers the primary qualifications obtained from the 130 or so dental schools within the EU as fulfilling the same educational standards.

At present, orthodontics has become a highly sophisticated health care service, which can provide excellent treatment of malocclusion and facial deformity, based on the premise that this treatment is given by well educated, skilled, and experienced clinicians. A pan-European curriculum for the postgraduate training of specialists in orthodontics at postgraduate level has been set out in the final report of the Erasmus project (van der Linden, 1996). Although no similar guidelines as yet exist for general dentists, few will argue that, on graduation, a dentist should be able to recognize a malocclusion, know which patients to refer, to whom they should be sent, at what stage of dental development the referral is appropriate, and be able to handle orthodontic cases in a manner that improves the overall quality of dentistry offered (Moore and Erickson, 1988; Gorczyca *et al*., 1989). It therefore follows that an adequately qualified oral health workforce is the key to providing the best possible orthodontic and oral health service to the population. However, as far as orthodontics is concerned, such a workforce may not necessarily consist solely of specialist orthodontists. Indeed, article 5 of EC Training Directive (78/687/EEC) allows dentists who do not possess the title of orthodontic specialist to perform orthodontic procedures provided that they possess the necessary knowledge. This ruling raises the question 'to what level should general dentists be trained in orthodontics?'

Aims of the Study

To establish the following facts for undergraduate orthodontic education in Europe:

1. Was orthodontics taught as part of the undergraduate curriculum in dentistry?
2. How many hours in the undergraduate curriculum were devoted to orthodontics?
3. How many hours in the undergraduate curriculum were allotted to theory, clinical practice, laboratory work, diagnosis, and treatment planning?
4. Which aspects of orthodontics therapy (use of removable, fixed and functional appliances were taught)? If fixed appliance therapy was taught, respondents were also invited to specify which systems were taught? Were there undergraduate examinations in orthodontic?

Materials and Methods

These have been described in the general introduction to this series. The questionnaire used in this survey is shown in Figure 1.

Results

It was possible to validate the responses from 23 countries (Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the U.K.). It appeared that orthodontics was taught in the undergraduate curriculums of all 23 countries. A response to the question on the total hours devoted to orthodontics was received from 22 out of 23 countries (no response was forthcoming from Austria for this question or to the other questions relating to curriculum hours). The reported hours ranged from 145 hours in the Czech Republic to 500 hours in the Netherlands, with a mean of 245 hours (Figure 2). Twelve of the 22 who responded to this question reported that their countries devoted between 200 and 280 hours in the undergraduate curriculum to orthodontic education, six between 135 and 199 hours, and four between 300 and 500 hours (Figure 2).

Within the overall number of hours, responses indicated that the hours allotted to theory, clinical practice, laboratory work, diagnosis and treatment planning were extremely variable. Theoretical orthodontic education was reported as comprising the largest share (mean 79 out of 245 hours) of the total hours of undergraduate orthodontic teaching (Figure 3). However, the range of hours reported as devoted to theory was very wide, from 15 in the Czech Republic to 300 in the Netherlands.

Clinical practice (mean 75 out of 245 hours) was reported as taking the next largest share (Figure 4). The range of reported hours was from 30 in Italy to 160 in the U.K.

Laboratory work was reported as taking a mean of 34 hours (Figure 5), with the respondent from Germany reporting 168 hours, and those from the Czech Republic and Slovakia no hours at all for laboratory work.

The range of reported hours for diagnosis was also wide, but not so wide, with a mean of 32 hours (Figure 6), and a range of from 75 hours in Belgium to 10 hours in Albania and the U.K.

Treatment planning was reported as taking up the smallest proportion of hours with a mean of 25 hours (Figure 7), and a range of from 70 hours in Denmark to 10 hours in Albania, Hungary and the U.K.

All respondents reported that removable appliances were taught in their countries other than the respondent from the Czech Republic. Only two countries (The Czech Republic and Norway) reported not teaching functional appliances. It was reported that fixed appliances were taught in 17 countries, but not in six (Belgium, France, Greece, Norway, Poland and the U.K.)

It was reported that a great diversity of fixed, removable and functional appliance systems were taught to undergraduates (Figure 8). Unfortunately, the responses to this question do not indicate how frequently they are used by the undergraduates, or orthodontists, or even if undergrad-

EURO-QUAL PROJECT
PROFESSIONAL DEVELOPMENT GROUP

TOPIC 1 – UNDERGRADUATE EDUCATION

Questionnaire

Will all members of the Euroqual Project please provide answers to the following questions by 6 March 1997 and return these answers to a member of the Professional Development Group on the first day of the Amsterdam meeting.

1. Is orthodontics taught as a part of the undergraduate curriculum in dentistry in your country?

   YES/NO

2. If yes, how many hours in the undergraduate curriculum is devoted to orthodontics?

   ..... hours

   Of this total how many hours are allotted to:-

Theory	.....hours
Clinical Practice	.....hours
Laboratory Work	.....hours
Diagnosis	.....hours
Treatment Planning	.....hours

3. Do you teach the following aspects of orthodontics to undergraduates:-

Removable Appliance Therapy	YES/NO
Functional Appliance Therapy	YES/NO
*Fixed Appliance Therapy	YES/NO

   *Please specify which systems:

   _____
   _____
   _____
   _____

4.Is there an undergraduate examination in orthodontists? YES/NO

This questionnaire was completed by:
(name) .....
(from) .....
(country) .....

FIG.1

uates actually use many of the systems as opposed to observing their use.

Respondents from 20 countries reported that there was an undergraduate examination in orthodontics. Three (from Albania, Austria and Bulgaria) reported that there was no examination in orthodontics for dental undergraduates.

Discussion

Although there was a 100 per cent response rate to the questionnaire, which was probably achieved because of the relatively brief questionnaire, the small numbers of respondents involved and the fact that most met annually and were keen to contribute to the EURO-QUAL project, as explained in the introduction to this series of papers. It was not possible to validate the responses from Croatia, Estonia, Latvia, Lithuania, and Romania, and they have not been included in the results to this paper or the others in the series. As mentioned in the general introduction to this series, it should be borne in mind that, although respondents were asked to verify their answers at a meeting some weeks after they had submitted them, there is always the possibility that they are answering not on behalf of their country, but of their university, department of province/region. This factor may be particularly relevant for larger countries with a number of autonomous regions or provinces, which may follow different practices as far as undergraduate education is concerned.

It appears that undergraduate orthodontic education is currently taking place in all European countries surveyed. The questionnaire did not seek to identify the quality of the undergraduate orthodontic curriculum. It did not differen-

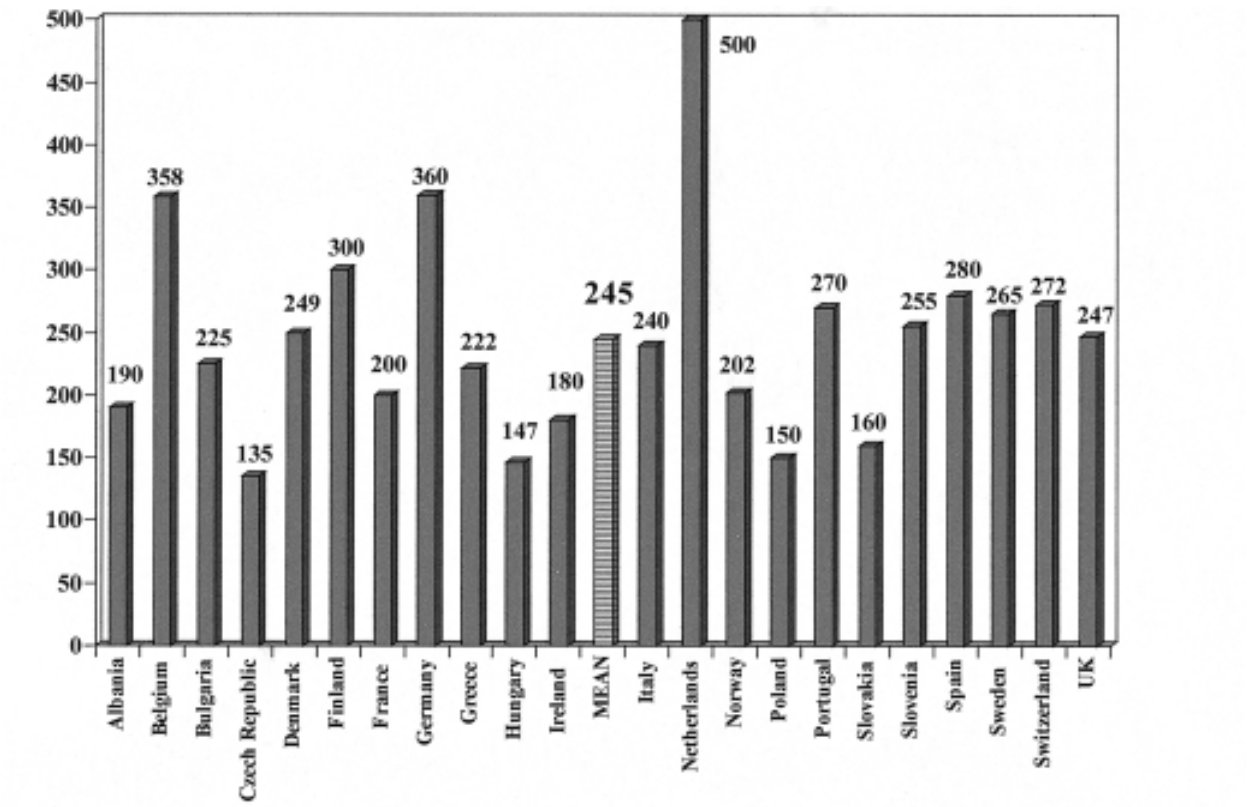

FIG. 2 Total number of hours of orthodontic teaching in undergraduate education.

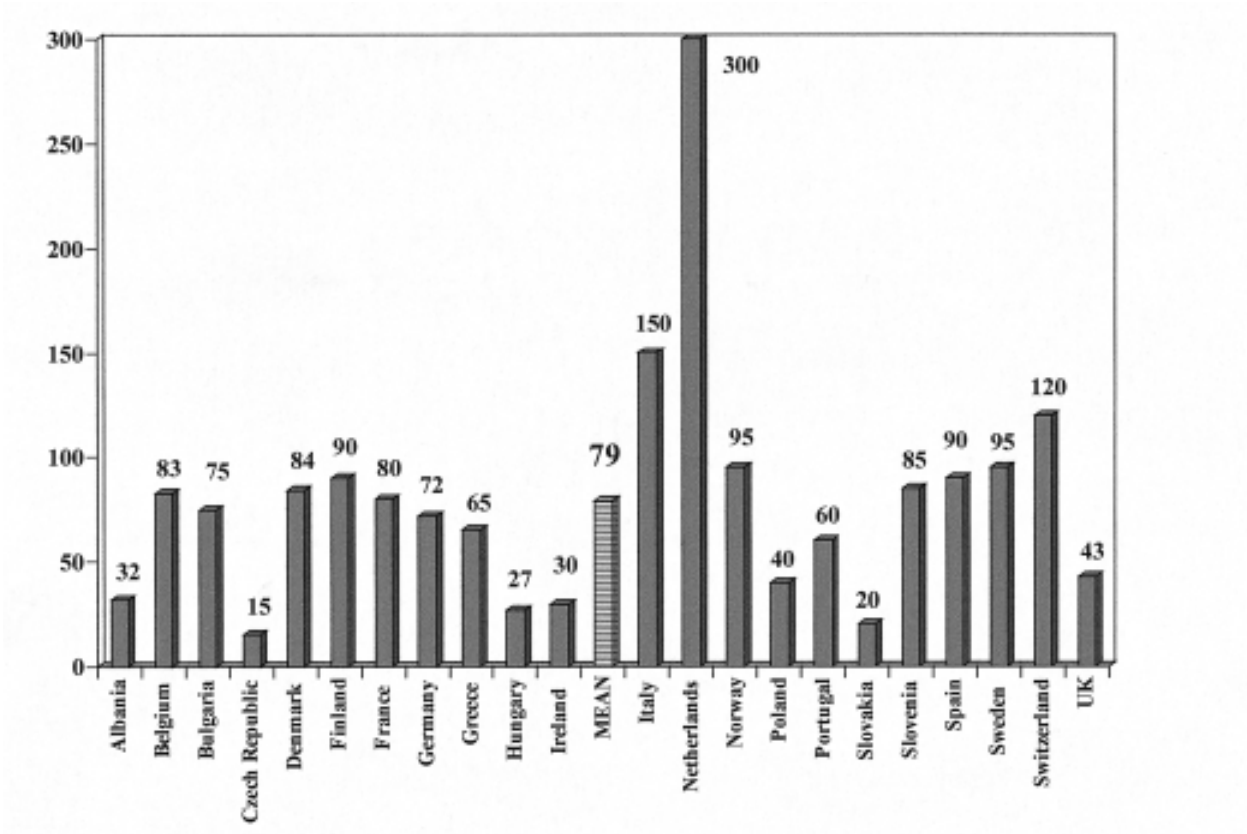

FIG. 3 Total number of hours of orthodontic theory in undergraduate education.

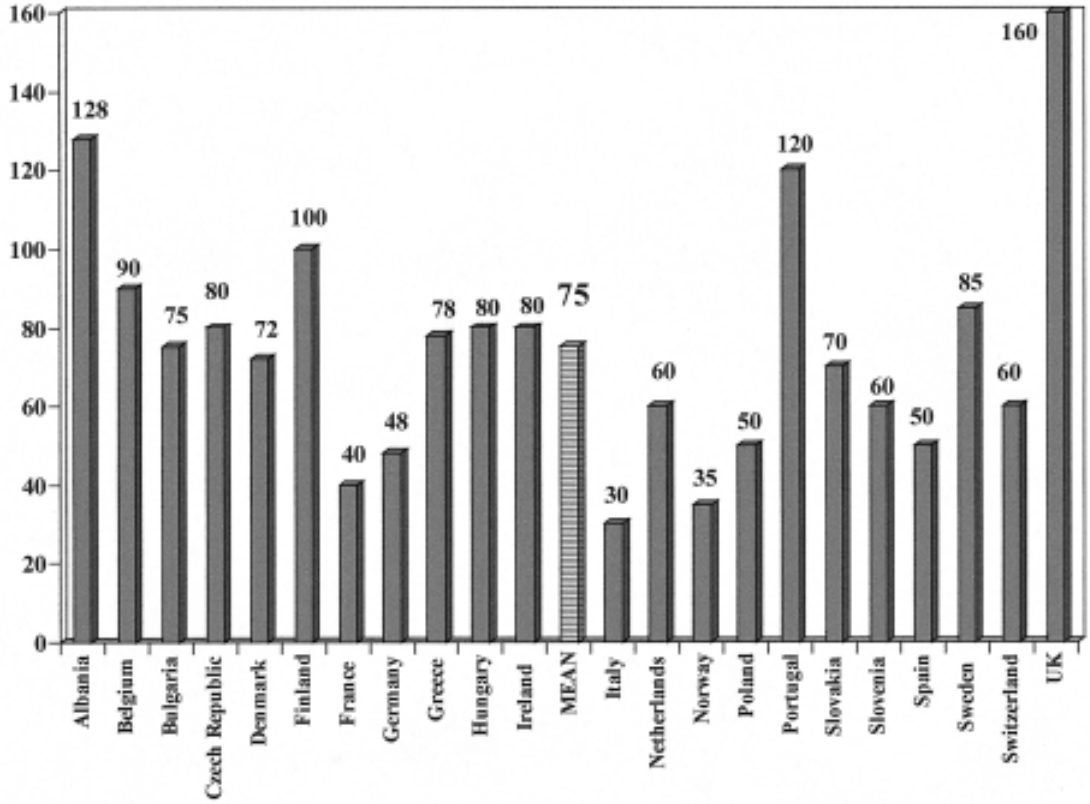

FIG. 4 Total number of hours of orthodontic clinical practice in undergraduate education.

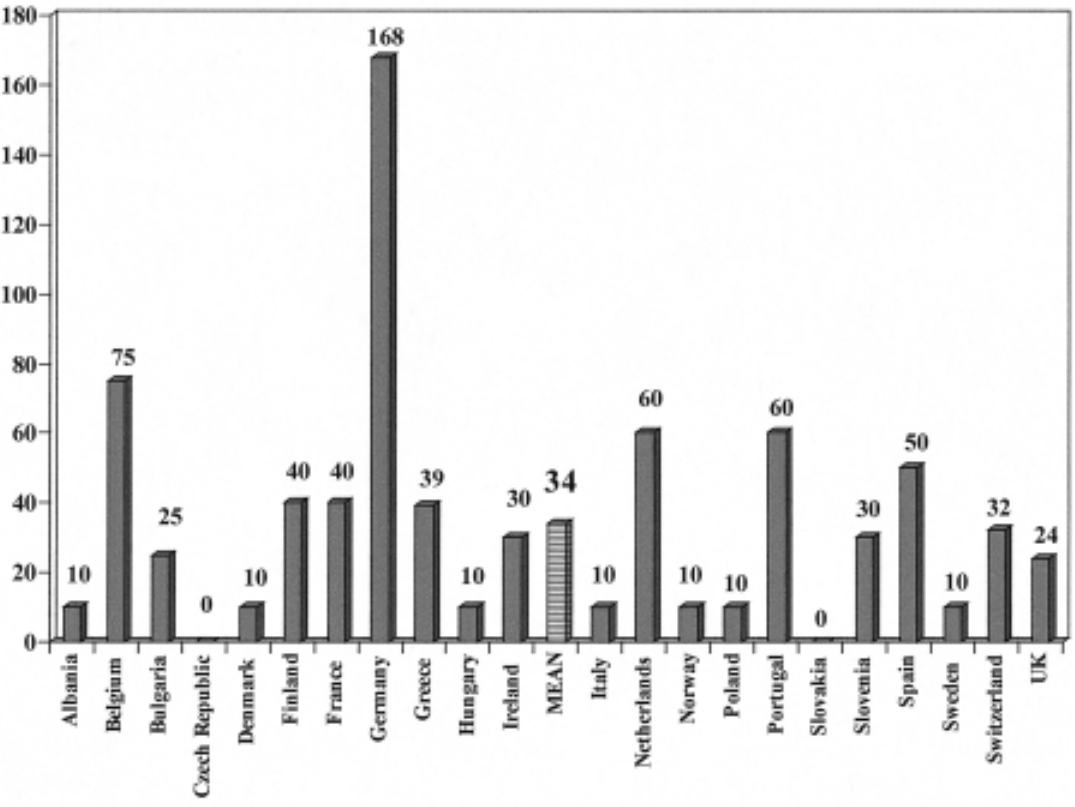

FIG. 5 Total number of hours of orthodontic laboratory work in undergraduate education.

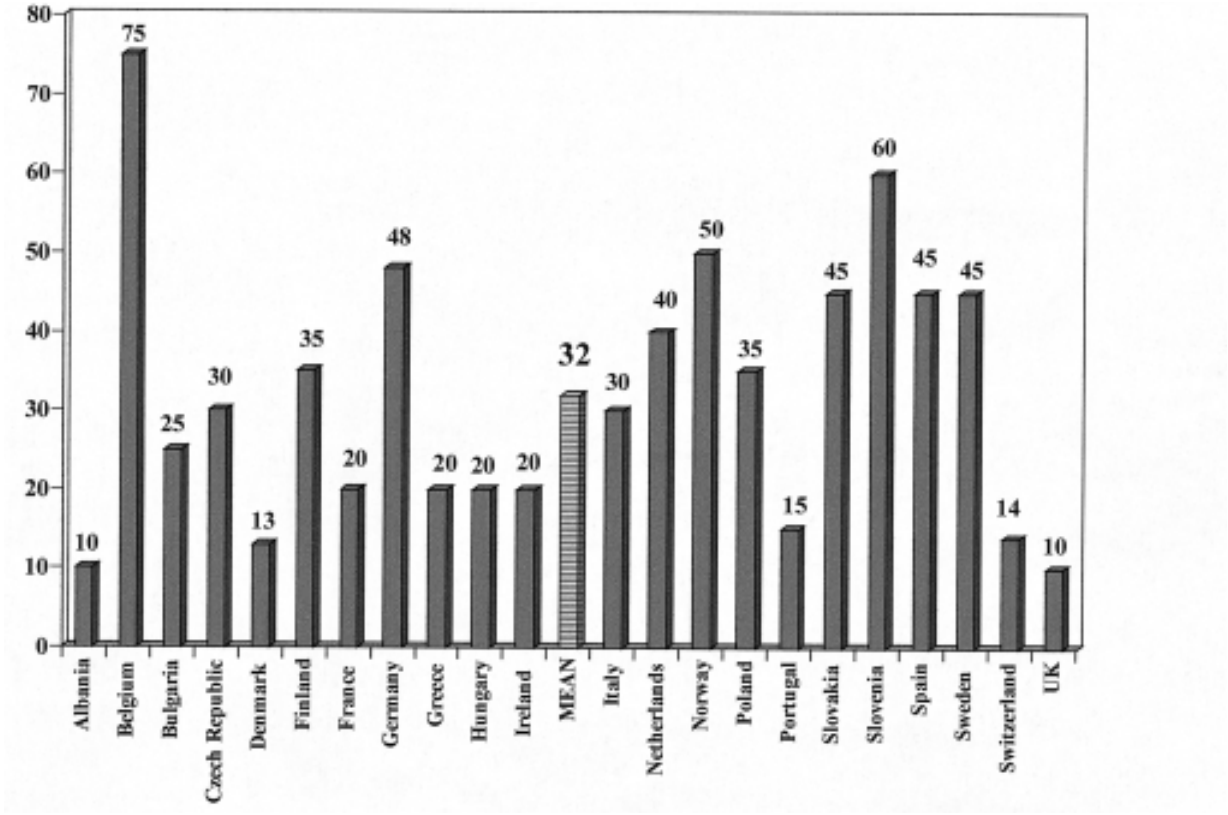

FIG. 6 Total number of hours of orthodontic diagnosis in undergraduate education.

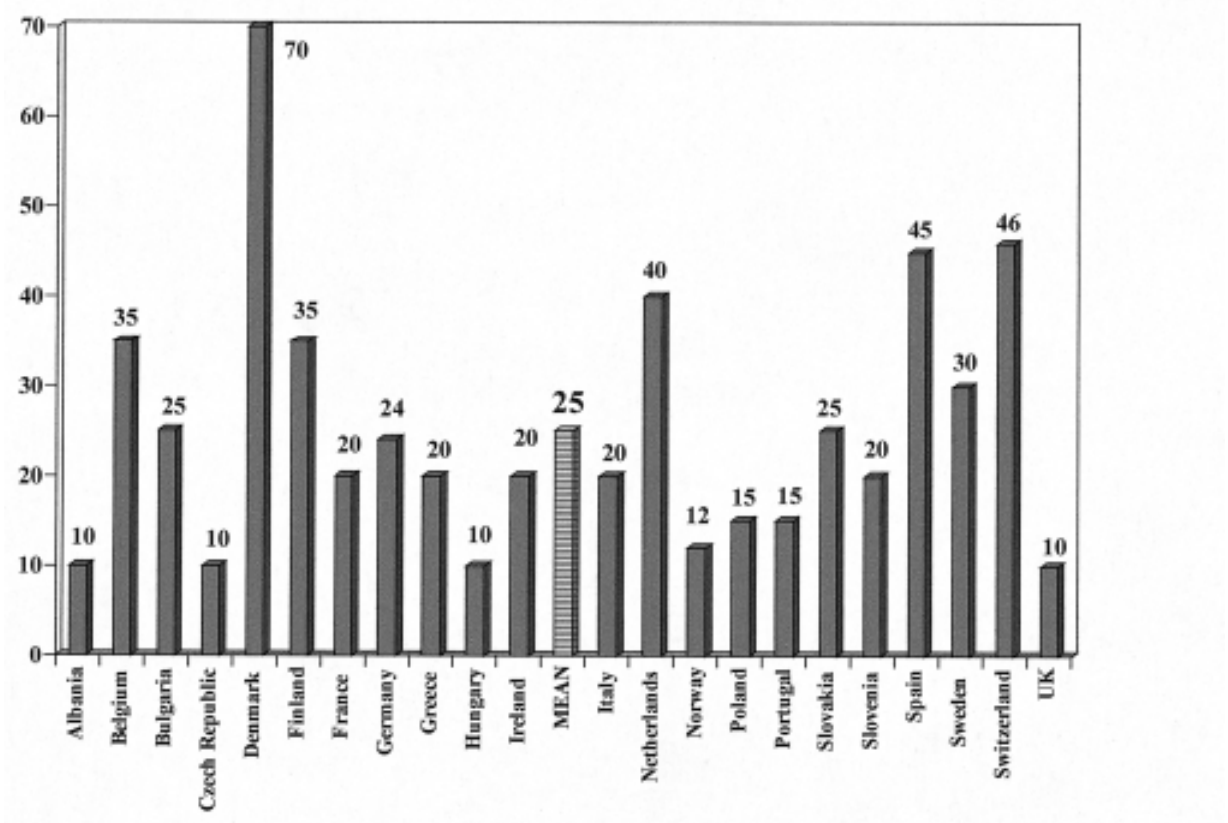

FIG. 7 Total number of hours of orthodontic treatment planning in undergraduate education.

Undergraduate orthodontic education
Comments on orthodontic systems taught to undergraduates

Austria:	"Basics of Straight wire, Burstone, Jarabak, Tweed and Ricketts."
Belgium:	"Closing of the central diastema, Rapid Maxillary Expansion, Biomechanics, Extra-oral traction, Palatal bar, Principles of intrusion.
Czech Republic:	"Students are taught to participate in some work with removable and fixed appliances, but they are not taught to use those appliances independently."
Denmark:	"Plates, Activators, Edgewise, Continuous and segmented arch approaches."
Finland:	"An application of edgewise technique."
France:	"All…."
Germany:	"(Bayern) Edgewise, Straight wire – (Bradenberg) Straight wire, Segmented arch."
Hungary:	"Edgewise, Straight-wire, Twin-wire, Bioprogressive, Straight wire."
Ireland:	"Straight-wire."
Netherlands:	"Straight wire (on a typodont), theoretical (also other systems are taught)."
Norway:	"Bands on molars, Brackets on incisors for minor movements, Labial arches."
Portugal:	"Plates, Lip-bumper, Extra-oral traction, Activators, Bimler. Insight into the possibilities and limitations of fixed appliance therapy."
Slovakia:	"Light wire, Straight wire, Ricketts technique."
Slovenia:	"Straight wire appliance therapy."
Spain:	"Edgewise (Ricketts, Burstone, Roth)."
Sweden:	"Main directions are growth and development, diagnosis, need of treatment, indications for treatment, what should we refer and at what age, examples of treatment possibilities."

FIG. 8

tiate an excellent curriculum from a good curriculum from an acceptable curriculum. However, it is reassuring to note that it appears that orthodontics is part of every undergraduate curriculum.

The responses to the questionnaire indicate that in 1997, with the caveat that some respondents may have been answering for their own university rather than for their country as a whole, the teaching of orthodontics took up a mean of 245 hours of the dental undergraduate curriculum in the 22 European counties that responded to this question. It is interesting to note that a recent survey of undergraduate dental training in the EU (Shanley *et al.*, 1997), to which 30 dental schools responded, the mean figure for hours of orthodontic training was 253, suggesting that in spite of the caveat, the figure of 245 hours may well be reasonably accurate.

It is also difficult to collect reliable data for the mean total length of the undergraduate dental curriculum in all European dental schools. However, a recent study (Widström *et al.*, 1996) suggests that the mean figure for 10 of the countries of the EU/EEA (Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Norway, Portugal and the U.K.) was 181 weeks (with a range of 140–200 weeks). If the study of orthodontics takes place during the second half of the undergraduate curriculum, when students may be working a 7-hour day (35 hours per week), then it is possible that on average orthodontic education may take up about 7 of the 181 weeks, or approximately 5 per cent of the total undergraduate curriculum hours in many EU/EEA countries. It is interesting to note that the curriculum for orthodontic specialist training recommended by the Erasmus project (Van der Linden, 1996) is 4800 hours.

As a clinical specialty it was not surprising that respon-

dents reported that clinical practice and theory together took up a major part of the hours allocated to the undergraduate orthodontic curriculum. However, the very wide range was perhaps surprising. This observation also applies to the hours dedicated to laboratory work, diagnosis and treatment planning. It was most surprising that in two countries, it appears that dentists can enter clinical practice with no experience of orthodontic laboratory work whatsoever. As undergraduate orthodontic training frequently concentrates on teaching students to recognize malocclusions, rather than to enable them to provide a wide range of treatment, it was not surprising that the fewest curriculum hours in the undergraduate orthodontic curriculum were devoted to treatment planning. Even though the use of removable appliances and functional appliances was taught in almost all undergraduate curriculums of the countries surveyed, it was perhaps surprising that respondents reported the use of fixed appliances as being taught in many countries.

Conclusions

1. This survey has revealed that orthodontics is taught briefly as part of the undergraduate curriculum in dentistry in all 23 of the European countries which responded to the questionnaire and had the responses validated.
2. In most of these countries emphasis is put on theory and clinical work. Removable appliances, functional appliances and even certain aspects of fixed appliances are taught in the majority of schools.
3. There appears to be a formal undergraduate examination in orthodontics in nearly all the countries surveyed.
4. Orthodontics occupies a small proportion of total undergraduate curriculum hours in most countries.
5. There are very wide differences between the countries in the total number of hours dedicated to undergraduate orthodontic teaching.

Acknowledgements

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A Survey of Postgraduate (Specialist) Orthodontic Education in 23 European Countries

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Abstract. *This paper reports on a survey of the duration, funding, and assessment of postgraduate specialist orthodontic training, the requirement for postgraduate training prior to entering specialist orthodontic training and registration of specialist orthodontists in Europe. A questionnaire and explanatory letter were mailed to all members of the EURO-QUAL BIOMED II project. Answers were validated during a meeting of project participants and by fax, when necessary. Completed questionnaires which were subsequently validated, were returned by orthodontists from 23 countries. The results indicated that a period of postgraduate training, prior to entering specialist orthodontic training was required in 12 of the responding countries. Specialist orthodontic training was reported as lasting 2 years in three countries, 3 years in 17, and for 4 years in three. Part-time training was reported as a possibility in four countries. In 21 of the 23 countries specialist training was reported to take place in full or part within universities, with some training taking place in government clinics in four countries. In five countries some or all training was reported to take place in specialist practices. Training was said to be funded solely or partially by governments in 15 of the 23 countries, to be solely self-funded in five countries, and partly or solely funded by universities in six countries. A final examination at the end of specialist training was reported to be held in 21 of the 23 countries. The nature of this examination varied widely and there was no such examination in two countries. Twelve of the 23 countries reported that they had a specialist register for orthodontics; 11 that they had no register. In none of the countries surveyed was there a requirement for those on a register to undergo periodic reassessment of competence once they are on the register. It was concluded that there was wide diversity in all aspects of specialist orthodontic training and registration within the countries surveyed.*

Index Words: Education Europe, Orthodontic, Postgraduate, Specialist

Introduction

This paper is one of a series produced by the Professional Development Group of the EURO-QUAL BIOMED II Project (ter Heege, 1997).

The quality of healthcare depends in part on the quality of the education and training received at the beginning and throughout the working life of those who provide it. The content and duration of specialist training in orthodontics and oral surgery within the member states of the European Union (EU) and European Economic Area (EEA) are prescribed by EC Training Directive (78/687/EEC), which came into effect some 20 years ago. This directive lists topics to be covered during training, but makes no attempt to suggest the level of competence that individuals should achieve before qualifying as a specialist orthodontist, or to how to maintain competence. These issues are left to the individual member states or authorities within each state to decide. Orthodontic societies and university departments have agreed the Erasmus syllabus (van der Linden, 1996) as a voluntary pan-European guideline for orthodontic training. However, there is little evidence of harmonization of standards in specialist orthodontic training within Europe (Kerr *et al*., 1993) with a number of countries and educational establishments declining or unable to become involved in any agreed pathway.

This lack of uniformity is particularly noticeable in relation to the assessment or examination at the end of formal specialist orthodontic training. At present, there appears to be wide variation ranging from externally audited tests of orthodontic ability, to a somewhat introverted discussion between the student and his/her own orthodontic trainer. Both of these polarised scenarios lead to specialist status within Europe and give the right of individual clinicians with EU nationality to practice their profession anywhere within the EEA.

The survey relating to postgraduate orthodontic education was undertaken against this background.

Aims

The study aimed to establish answers to the following questions for the countries concerned:

1. Is a period of general postgraduate training necessary before beginning specialist orthodontic training, if so, how long does this general training take?
2. As far as specialist orthodontic training is concerned—how many years full time does it take, is it possible to train part time, where does the training take place and what is the source of funding for the training?
3. Is there a final examination at the end of specialist orthodontic training? If so what does it consist of and who sets it?
4. Is there a specialist register? If so, how long after completion of training can a trained orthodontic specialist gain access to the Register and by what method. Are those on the specialist register for orthodontics regularly reassessed for continued competence?

Methods

The methods used have been described in the introduction to this series. The questionnaire used in this study is shown in Figure 1.

Results

It was possible to validate the responses from 23 out of the 28 countries.

The responses indicated that in 12 of the 23 responding countries no period of training was required after graduation from dental school before beginning specialist orthodontic training. Of the 11 countries which did require such training, two (Switzerland and Germany) required 1 years' further training, eight (Austria, Czech Republic, Denmark, Finland, Ireland, The Netherlands, Norway, Slovenia, Sweden, and the U.K.) a minimum of 2 years and one (Poland) a minimum of 3 years (Figure 2).

As far as specialist orthodontic training was concerned of the 23 countries, 17 reported a 3 year full time course, two a 4 year full time course (Belgium and the Netherlands), one a 4-year part time course (France), and three a 2-year course (Albania, Austria, and Italy). Apart from France, three other countries (Sweden, Switzerland, and the U.K.) reported that it was possible to undertake part time training over a minimum of 4 years as an alternative to a 3-year full time course. In France, it was reported that there was only a 4-year part time course and that full time training was not possible (Figure 3).

The reported location of specialist orthodontic training varied considerably. In 14 of the 23 countries surveyed, it appears that training takes place exclusively in universities, in four of the 23 countries (Ireland, Poland, Sweden, and the U.K.) in a combination of universities and government clinics, in three of the 23 countries (Germany, Slovenia, and Switzerland) in a combination of universities and specialist practice, and in the remaining two of the 23 countries (Bulgaria and Slovakia) solely in specialist practice (Figure 4).

The funding of specialist orthodontic training was reported as coming from a variety of sources. In 15 of the 23 countries funding came solely or partially from government sources. In five of the 23 countries (Austria, Italy, Norway, Portugal, and Spain) it was reported to be solely self-funded. In a further two countries (Germany and Switzerland), it was reported to be a combination of university and self-funding, and in the final country (Denmark) to be solely university funded (Figure 4).

Respondents from 21 out of the 23 countries reported that there was a final examination. In 11 countries, the examination comprised of four parts (orals, written, clinicals, and case presentations), in five of three parts, in a further three of two parts, and in the final two countries of just one part. It was reported that two countries did not set a final examination (Austria and Spain; Figure 5).

The body responsible for conducting the final examination was reported to be universities in 16 of the 21 countries, exclusively in 13 countries, in combination with the Royal Colleges in two countries (U.K. and Ireland), and in combination with the specialist association in one country (Germany). In four of the 21 countries (Czech Republic, Denmark, Finland, Sweden) the government was reported to be the examining body. In the remaining country (The Netherlands) the examining body was reported to be the specialist association (Figure 5).

It was reported that there is a specialist register in 12 of the 23 countries and no such register in the other 11. There is immediate access, on completion of training, to the specialist register for orthodontics, in nine of the 12 countries. However, in one of these nine countries (Switzerland) applicants are required to perform case presentations when they apply to go on the register. In two of the 12 countries (Czech Republic and Denmark) entry to the specialist register cannot take place until 1 year after the completion of specialist training and involves passing an examination. In the twelfth country (Sweden) access was reported to be by examination, three years after the completion of specialist training (Figure 6).

Answers to the final question in the questionnaire indicated that, at present, none of the 23 countries reassess their specialist orthodontists on a regular basis once they have gained access to the specialist register.

Discussion

One of the joys of living in Europe is the cultural diversity within a relatively small geographical area. It would appear that this diversity also manifests itself in the postgraduate training prior to specialist training in orthodontics, Postgraduate (specialist) orthodontic training, and assessment within Europe.

Respondents from the 23 countries were evenly split when asked if a period of general postgraduate training was necessary before undertaking orthodontic specialist training (12 yes, 11 no). Nine of those countries who insisted on pre-specialist training stipulated 2 years, two asked for 1 year, and one for 3 years.

Once specialist training begins, in the majority of 23 countries, courses are 3 years full time. In one of the two countries with a full time 4-year course (The Netherlands) the trainee orthodontists are required to teach undergraduates during the 4 years. In view of the recommendations within the Erasmus syllabus (van der Linden, 1996) and the

QUESTIONNAIRE ON SPECIALIST TRAINING IN ORTHODONTICS

1. Is a period of training necessary before beginning specialist Orthodontic training in your country?	**YES/NO**
2. If yes, how long does it take :	
1 Year	**YES/NO**
2 Years	**YES/NO**
3 Years	**YES/NO**
more	**YES/NO**
3. Specialist Orthodontic Training:	
How many years full time? 1 year	**YES/NO**
2 years	**YES/NO**
3 years	**YES/NO**
Can it be part time?	**YES/NO**
Does it take place in a University? (if not, where.....)	**YES/NO**
Who funds the Students?	
Self	**YES/NO**
Universities	**YES/NO**
Government	**YES/NO**
Other (please specify)	**YES/NO**
4. Is there a Final Examination at the end of the course?	**YES/NO**
If yes, does it include:	
Orals	**YES/NO**
Written	**YES/NO**
Clinicals	**YES/NO**
Case presentation	**YES/NO**
5. Which body is responsible for the setting of the Examination?	
University	**YES/NO**
Hospital	**YES/NO**
Specialist Association	**YES/NO**
Government	**YES/NO**
Other (please specify)	**YES/NO**
6. Is there a Specialist Register in your country?	**YES/NO**
If yes, how long after training can one gain access?	
1 year	**YES/NO**
2 years	**YES/NO**
3 years	**YES/NO**
4 years	**YES/NO**
5 years	**YES/NO**
other (please specify)	**YES/NO**
7. How does an orthodontist gain access to the Register?	
by examination	**YES/NO**
by case presentation	**YES/NO**
other (please specify)	**YES/NO**
8. Are Orthodontists on the Specialist Register re-assessed Regularly?	**YES/NO**

This questionnaire was completed by .....
from .....(country)

FIG. 1.

POSTGRADUATE TRAINING PRIOR TO SPECIALIST ORTHODONTIC TRAINING (answers to questions 1 & 2 [Figure 1])

	Prior Training (Yes / No)	Length if Yes
Albania	No	
Austria	Yes	2 Years
Belguim	No	
Bulgaria	No	
Czech Republic	Yes	2 Years
Denmark	Yes	2 Years
Finland	Yes	2 Years
France	No	
Germany	Yes	1 Years
Greece	No	
Hungary	No	
Ireland	Yes	2 Years
Italy	No	
Netherlands	No	
Norway	Yes	2 Years
Poland	Yes	3 Years
Portugal	No	
Slovakia	No	
Slovenia	Yes	2 Years
Spain	No	
Sweden	Yes	2 Years
Switzerland	Yes	1 Years
United Kingdom	Yes	2 Years

FIG. 2.

LENGTH AND NATURE OF SPECIALIST TRAINING IN ORTHODONTICS (answer to question 3 [Figure 1])

Length in years	1	2	3	4
Albania		X		
Austria		X		
Belguim				X
Bulgaria			X	
Czech Republic			X	
Denmark			X	
Finland			X	
France				P
Germany			X	
Greece			X	
Hungary			X	
Ireland			X	
Italy		X		
Netherlands				X
Norway			X	
Poland			X	
Portugal			X	
Slovakia			X	
Slovenia			X	
Spain			X	
Sweden			X	P
Switzerland			X	P
United Kingdom			X	P

KEY:

P = Part time training possible
X = Full time training

In France orthodontic training is part time over a minimum of 4 years

In the Netherlands some time is taken up teaching undergraduates

FIG. 3.

requirements of the EC Training Directive (78/687/EEC), it was somewhat surprising to learn that three European countries, two of whom are members of the EU, still appear to offer a specialist orthodontist training programme which lasts for only 2 years full time.

It is becoming increasingly obvious that part time courses fulfil the needs of a number of students. It was reported that one country, France, offers tuition solely on a part time basis over a 4-year period. A further three countries, Sweden, Switzerland and the U.K., were reported as offering the option of part time training. For those countries offering a full time 3-year course, at least one additional year must normally be spent when the programme is undertaken on a part-time basis and the total course hours must be no less than if the course had been full time EC Training Directive (78/687/EEC)

When the location of specialist orthodontic training and sources of funding were investigated, the diversification within Europe became more apparent. Although in the majority of countries, such training was reported as taking place in universities and university clinics, in some it may be in combination with training in government clinics or specialist practice. In two countries training was reported as occurring exclusively within the specialist practice (Bulgaria and Slovakia), a situation also found in some German Länder (regions) when there are insufficient places at university. The authors found this diversity somewhat surprising.

A recent survey (Widström and Eaton, 1999) has shown that there is a 'north/south' divide within the 18 countries of the European Economic Area, as far as the provision of public funding for oral health care is concerned. In all EEA countries there is some public and some private funding and a variety of systems. However, the proportion of public funding for oral health care is much lower in the majority of the countries in the south of the EEA that in those in the north. Although a direct comparison is difficult, as several eastern European countries were included in the current study, it was noticeable that with the exception of Norway, self-funding for orthodontic training was commoner in southern European countries and public funding in northern European countries.

LOCATION AND FUNDING OF SPECIALIST TRAINING IN ORTHODONTICS
(answer to final part of question 3 [Figure 1])

Location	University	Government Establishment	Specialist (Practice)
Albania	G		
Austria	S		
Belguim	UG		
Bulgaria			SG
Czech Republic	SGU		
Denmark	U		
Finland	G		
France	G		
Germany	SU		S
Greece	SG		
Hungary	SG		
Ireland	G	G	
Italy	S		
Netherlands	G		
Norway	S		
Poland	GS	G	
Portugal	S		
Slovakia			G
Slovenia	SG		G
Spain	S		
Sweden	G	G	
Switzerland	SU		S
United Kingdom	SU	SG	

KEY:
S = Self funded
G = Government funded
U = University funded
UG = Part University/Part Government funded
SGU = Part Self/Part Government/Part University funded
SU = Part Self/Part University
SG = Part Self/Part Government funded

In Germany: certain Länder (States) allow 3 years training in a dental practice (office) as an alternative to a University clinic

In Ireland, UK, Poland and Sweden: a combination of University and Government establishments are used as training locations

FIG. 4.

The widest diversification was reported in the form of the final examination at the end of orthodontic specialist training. If such an examination is deemed to be a mechanism for assessing the quality of care which an orthodontist can provide, then it is difficult to see how standards can be harmonized within Europe until such time as all orthodontic specialists are assessed when they complete training. It is also reasonable to suggest that any assessment should be to the same standard in all countries, if orthodontic specialists are to continue to enjoy the freedom to establish practice in European countries other than their own. The results of the current survey indicate that at present Europe is far from achieving these goals. In two countries it was reported that there was no formal examination whatsoever at the end of specialist orthodontic training. In the other 21 countries, there were considerable variations in the mechanisms for assessing the abilities of the trainees at the end of their training.

The reported absence of a specialist register in 11 of the 23 countries was also surprising, as was the range of mechanisms for gaining access to the register in the 12 countries with a register. It would be interesting to elucidate why four European countries require specialist orthodontists to successfully pass further assessments, after those taken at

FINAL EXAMINATION(S) AT THE END OF SPECIALIST TRAINING IN ORTHODONTICS
(answers to questions 4 & 5 [Figure 1])

Is There A Final Examination ?	No	If Yes (constituent parts)	If Yes (examining bodies)
Albania		O	U
Austria	No	None	None
Belguim		O - C - CP	U
Bulgaria		O - W - C - CP	U
Czech Republic		O - C - CP	G
Denmark		O - W - CP	G
Finland		W	G
France		O - W - C - CP	U
Germany		W - O	U - S
Greece		O - W - C - CP	U
Hungary		O - C	U
Ireland		O - W - C - CP	R -U
Italy		O - W - C - CP	U
Netherlands		O - CP	S
Norway		O - W - C - CP	U
Poland		O - C - CP	U
Portugal		O - W - CP	U
Slovakia		O - W - C - CP	U
Slovenia		O - W - C - CP	U
Spain	No	None	None
Sweden		O - W - C - CP	G
Switzerland		O - W - C - CP	U
United Kingdom		O - W - C - CP	U - R

KEY:

CONSTITUENT PARTS
O = Orals
W = Written
C = Clinicals
CP = Case presentations

EXAMINING BODIES
U = University
S = Dental/Specialist Association
G = Government
R = Royal Colleges

FIG. 5.

the end of specialist training, before they can be admitted to the specialist register for orthodontics. However, once on a specialist register, the responses to the survey indicated that European orthodontists are not currently reassessed at regular intervals to confirm their continuing competence.

Conclusions

This survey has shown that at present there is:

1. A wide diversity in all aspects of orthodontic specialist training throughout the 23 countries that reported data and that the data was invaluable to the authors when they drafted suggested quality guidelines for orthodontic specialist training in Europe.
2. It appears that some 20 years after EC Training Directive (78/687/EEC) came into force, some countries are not meeting its requirements.

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EXISTENCE OF AND ENTRY TO A SPECIALIST REGISTER FOR ORTHODONTICS
(answers to questions 6 & 7 [Figure 1])

Specialist Register	No	If Yes (time of entry)	If Yes (mode of entry)
Albania	None		
Austria	None		
Belguim		0	A
Bulgaria	None		
Czech Republic		1	E
Denmark		1	E
Finland		0	A
France	None		
Germany		0	A
Greece	None		
Hungary	None		
Ireland	None		
Italy	None		
Netherlands		0	A
Norway		0	A
Poland	None		
Portugal	None		
Slovakia		0	A
Slovenia		0	A
Spain	None		
Sweden		3	E / A
Switzerland		0	CP
United Kingdom		0	A

KEY:

TIME OF ENTRY
0 = on completion of specialist training
1 = 1 year after completion
3 = three years after completion

MODE OF ENTRY
A = by application
E = by examination
CP = by case presentation

FIG. 6.

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