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Evaluation of a British–German postgraduate course in clinical pharmacy

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Abstract

Since 1997, a 4 week postgraduate course in clinical pharmacy has been offered annually at the University of Tübingen (Germany) in cooperation with the School of Pharmacy, University of London (United Kingdom). The course combines a theoretical and a practice-based module; a concept which is unique in Germany, but well established in the UK. The present study evaluated whether former participants found the course useful for their daily practice. A structured questionnaire was sent to all former participants ($n = 102$), 66 (65%) responded; 63 pharmacists (95%) found the course subjects useful. A total of 61 respondents (92%) were involved in 223 clinical pharmacy projects which were related to course subjects, including drug information services, participation in ward rounds and patient counselling. A lack of time was identified as the main barrier to implementing such services. Pharmacists felt more competent to work with doctors after completion of the course (40, 61%) though this was subjective. This collaborative programme helped to share expertise in teaching and clinical pharmacy practice across countries.

Keywords: *Bed-side teaching, clinical pharmacy, Germany, postgraduate education*

Introduction

Over recent decades, pharmacists have developed clinical roles ensuring medicines are used safely and effectively in delivering patient care (World Health Organisation, 1994). In the UK, recent policy documents indicate that these relatively new roles of hospital and community pharmacists have been recognised at governmental level (Department of Health, 2000; Audit Commission for Local Authorities and the National Health Service in England and Wales, 2001). This change of focus of the profession is also reflected by changes in undergraduate and postgraduate education and training of pharmacists. To become a pharmacist in Germany or in the UK, students have to complete 4 years of undergraduate studies and 1 year of pre-registration training.

Whereas clinical pharmacy has been established as a subject area in the UK undergraduate curriculum for many years, this has been only recently introduced in the German curriculum (Zweite Verordnung zur Änderung der Approbationsordnung für Apotheker, 2000). Despite being taught clinically oriented subjects, pharmacy students traditionally have little contact with patients at an undergraduate level to learn to apply their pharmaceutical knowledge. A range of postgraduate courses has been developed to address this application For example, postgraduate qualifications in clinical pharmacy can be obtained at different levels at the School of Pharmacy, University of London, UK (The School of Pharmacy, 2003). The Certificate is an in-service training scheme which can be taken at an accredited hospital over about 6 months, the Diploma is a 12 months part-time programme and the Master of

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Science (M.Sc.) is a 2 year part-time programme. Or pharmacists can also complete a 1 year full-time M.Sc. programme (Mangues and Dhillon, 2000). All of these courses combine class room teaching (either at the university or in the hospital) with bed-side teaching. Successful candidates have to pass written exams and they have to demonstrate their clinical skills in practice. Similar courses are offered at other universities across the UK. In Germany, the most common postgraduate qualification in clinical pharmacy is the *Fachapotheker in Klinischer Pharmazie* which is organised by the Chamber of Pharmacists. Pharmacists have to work in an accredited hospital pharmacy for 3 years, attend a number of seminars and pass an oral exam. But this course does not include a clinical practice-based component. Since 1997 a joint postgraduate course in clinical pharmacy is offered once a year at the University of Tübingen in cooperation with the School of Pharmacy, University of London. This postgraduate course has a clinically based focus following a similar structure to the Certificate in Pharmacy Practice at the University of London. The aims are:

- To provide pharmacists with an overview of clinical pharmacy practice.
- To develop prescription monitoring and basic drug information skills.
- To enable pharmacists to identify and interpret laboratory and pharmacokinetic data to optimise drug therapy.
- To enable pharmacists to identify patient groups where dose optimisation requires application of pharmaceutical skills.

A theoretical module of 10 days is held at the University of Tübingen. Teaching formats include lectures, seminars and workshops and one patient interview in the hospital. The teaching team includes experienced clinical pharmacists, physicians and academics. This is followed by a practice-based module. The participants spend 2 weeks on a ward under the supervision of a clinical tutor. During that time they attend ward rounds, discuss drug therapy with doctors, nurses and patients and undertake a range of course work and self-directed learning. All the clinical tutors are experienced clinical pharmacists with a post-graduate qualification in clinical pharmacy. A 1 day training session is held for the tutors at the University of Tübingen before the start of the clinical placements each year. Table I provides an overview of the course content.

The assessment of the German pharmacists is the same as for the certificate course in London; a range of course work and a 2.5 h written exam, comprising two multiple choice (MCQ) sections (referred to as sections A and B) and a written prescription monitoring section (referred to as section C). Section A and B are identical to the exam in London, section C comprises a similar range of questions as in London.

Table I. Overview of course content.

Introductory course in clinical pharmacy—part 1
(10 days, 55 h of teaching)
Introduction to clinical pharmacy
Patient records and medical terminology
Applied pharmacokinetics and therapeutic drug monitoring
Interpretation and use of laboratory data
Adverse drug reactions
Infusion therapy
Basics of pain management
Drug information
Applied therapeutics: parenteral nutrition, oncology, wound management
Study and presentation of clinical cases
Continuing professional development
Introductory course in clinical pharmacy—part 2
(10 days practice activities)
Prescription monitoring
Patient profiles
Patient counselling
Case presentation
Ward rounds
Diary/clinical portfolio

A number of measures are used to evaluate the course (continuously). For example participants completed a short questionnaire after each seminar and shortly after they finished the course. The results of these evaluations were used to improve the course. A telephone survey was undertaken of the participants of the first course and their chief pharmacist some months after the course (Vasel-Biergans and Heide, 2000). The participants said the course was relevant for their practice and they named a number of clinical pharmacy projects which they had started after the course. However since 1998, no long-term evaluations had been undertaken. Over 100 pharmacists participated in the certificate course between 1997 and 2001.

The aim of the present study was to identify to the extent to which pharmacists found the course useful for their daily practice, which subjects were most relevant and if the pharmacists were delivering patient centred services following the course. Asking about the latter point was important because patient-centred clinical pharmacy services, such as prescription monitoring or patient counselling are not widely practiced in German hospital pharmacy practice; it was unknown whether the pharmacists had the opportunity to set up such services at their workplace and continue to provide them. A further aim was to explore the barriers against using knowledge and skills from the course.

Materials and methods

A structured questionnaire was sent to all former participants of the courses from 1997 to 2001 in spring 2003. Participants of the most recent course in 2002/2003 were excluded as we were interested in the longer term outcomes of the course. A reminder letter containing the same questionnaire was sent to all

non-responders 4 weeks later. Both mailings included a pre-paid envelope to return the completed questionnaire. The questionnaire was based on the results of the evaluation of the course in 1998 (Vasel-Biergans and Heide, 2000). The content and wording of the questionnaire was discussed amongst four pharmacists, all of whom were involved in the certificate course, and a pharmacy student who provided a student perspective. The final questionnaire included 13 questions formatted on three A4 pages. Pilot work suggested that the completion of the questionnaire took about 15–30 min.

Data included their current occupation and workplace, the course subjects which could be used in practice, type of projects which were implemented in practice, any barriers against implementation of clinical pharmacy in practice and changes in attitude or behaviour after the course. To trigger responses and to make the questionnaire easy to complete, a list of possible answers were provided with each question. There was also space for additional comments. An open question asked for any other comments at the end of the questionnaire. All data was analysed using SAS V.8.

Results

One hundred and two pharmacists had participated in the courses between 1997 and 2001. Out of these 66 (65%) pharmacists returned the questionnaire; 16 (16%) letters were returned because of an out of date address s and 20 (20%) were non-responders. The response rates were similar across the different courses (Table II).

At the time of the survey, 56% of pharmacists worked in hospital and 21% in community pharmacy. Many had other postgraduate qualifications (*Fachapotheker*) in clinical pharmacy or in community pharmacy. Almost a quarter (24%) had a Ph.D. Table III shows the main characteristics of the respondents.

Pharmacists, 29 (44%), used between one and three subject areas in practice whilst the majority (34, 52%) used between four and seven subject areas from the course. Drug information was relevant for nearly all the pharmacists (56, 85%). Prescription monitoring, wound management and oncology were also named frequently (Table IV). Five pharmacists indicated that they were not involved in clinical pharmacy patient-centred projects involving course subjects. A total of 61 pharmacists named a total of 223 projects. A total of 31 (47%) pharmacists named between one and three projects and 30 (45%) named between four and ten projects. A total of 179 (80%) of these projects were continued at the time of the survey. Table V shows a detailed breakdown of the number of hospital and community pharmacists who were involved in the different projects. Projects ranged from the individual patient up to the policy level; for hospital pharmacists, close cooperation with doctors in ward rounds was a main clinical pharmacy activity. Community pharmacists were frequently involved in patient counselling and patient education. Table VI shows the barriers for implementing course subjects in practice; a lack of time was identified frequently. Lack of cooperation of doctors, financial constraints, and lack of support by the chief pharmacist were also frequent barriers. Three (5%) of pharmacists could not apply any of their course subjects to their practice. These pharmacists worked in industry; example in regulatory affairs. The course had other benefits for the pharmacists as well (Table VII). The majority (40, 61%) felt more competent to work with doctors and had new ideas for projects (38, 58%). A total of 36 (55%) pharmacists found that their self confidence to deal with doctors had increased. Others felt an increased satisfaction with their work and were motivated to start new projects. Two pharmacists did not report any changes in this category.

Table II. Response rate by course.

Course	Number of respondents/participants
1997	7/19 (37%)
1998	14/20 (70%)
1999	14/22 (64%)
2000	14/21 (67%)
2001	17/20 (85%)

Table III. Characteristics of responding participants and response rate by course year ($n = 66$ pharmacists).

Mean age (range)	35 years (28–50 years)
Female	55 (83%)
Current employment	
Hospital	37 (56%)
Community pharmacy	14 (21%)
Industry	5 (8%)
Other	9 (14%)
Not working	1 (2%)
Other postgraduate qualifications (*Fachapotheker*)	
Clinical pharmacy	29 (44%)
Community pharmacy	4 (6%)
Drug information/other	8 (12%)
Ph.D.	16 (24%)

Table IV. Course subjects which were useful for the daily practice of the pharmacists ($n = 66$ pharmacists).

Course topic/subject area	Number of pharmacists
Drug information	56 (85%)
Prescription monitoring	38 (58%)
Wound management	30 (45%)
Supportive therapy in oncology	28 (42%)
Parenteral nutrition	24 (36%)
Therapeutic drug monitoring	24 (36%)
Guidelines	21 (32%)
Other topics	13 (20%)

Table V. Projects implemented by the pharmacists by area of practice.

Type of project	Hospital pharmacist ($n = 37$)	Community pharmacists ($n = 14$)	Other area ($n = 15$)	Total ($n = 66$)
Drug information service	26	7	8	41
Close cooperation with doctors	23	7	9	39
Participation on ward rounds	23	4	7	34
Patient counselling	8	13	4	25
Committee/guidelines	8	1	7	16
Patient education	5	6	4	15
Therapeutic drug monitoring service	10	0	5	15
Pharmaceutical care	4	8	0	12
Quality management initiative	5	2	4	11
Other projects	8	2	5	15
Total no. of projects	120	50	53	223

Discussion

The evaluation of this German postgraduate course in clinical pharmacy showed that the majority of participants applied subjects from the course in their daily practice. Pharmacists who worked in industry had fewer opportunities to use the knowledge from the course. A majority had very positive changes, for example more satisfaction with their work or a higher confidence working with doctors were reported. Lack of time was seen as the main barrier for changes in practice. These data indicate the majority of course subjects are relevant for the practice of German pharmacists. As has already been highlighted, this was one of the first German courses which included a ward-based clinical placement. This may have often been the first opportunity for the pharmacists to spend time on the wards discussing individual patient's drug therapy with doctors, nurses and the patients. This experience seemed to have increased the pharmacist's confidence to work with doctors in their own daily practice.

The majority of these pharmacists were involved in clinical pharmacy projects. In the UK, in response to a survey of graduates of a Master's course in Clinical Pharmacy, it has been suggested that many graduates progress to become innovative leaders in developing clinical pharmacy practice (Personal Communication, Dr S.A. Francis). There are no data on Germany to identify whether pharmacists, who had participated in the certificate course, were involved to a greater extent in clinical pharmacy activities than other pharmacists. But it is encouraging to see that so many pharmacists had taken up important clinical roles at the policy and ward levels as well as in patient focused care. There is evidence that pharmaceutical services provide great benefits to individual patients or the health care system in Germany (Dörje et al., 1996; Kahmen and Schaefer, 2001; Schulz et al., 2001). More work should follow up these findings to improve pharmaceutical services in the German health care system.

There are several limitations to this evaluation. Firstly, a reasonable response rate was attained, non-responders may have held other views which could not be included in this survey. Secondly, the pharmacists had a number of other postgraduate qualifications and some of the effects to practice may not be solely due to the certificate course. Thirdly, the impact of this course on the quality of pharmaceutical care for patients remains unknown, i.e. a pharmacist performing better in their daily practice after completing this course, for example improving patients' outcome. Further work should investigate the outcome of postgraduate clinical pharmacy education on this higher level (Wilkes and Bligh, 1999).

As has been already highlighted, clinical pharmacy has only recently been introduced into the German pharmacy undergraduate curriculum. The new undergraduate curriculum could attempt to integrate a clinically focused component as has been suggested

Table VI. Barriers preventing implementation of course content into practice.

Barriers	Number of pharmacists ($n = 66$)
Lack of time	51 (77%)
Lack of finance	19 (29%)
Lack of doctors' cooperation	18 (27%)
Lack of support by chief pharmacist	14 (21%)
Course was not relevant for area of practice	7 (11%)
Other	10 (15%)

Table VII. Impact of the course on self confidence and motivation to work and other changes ($n = 66$ pharmacists).

Type of impact	Number of pharmacists
Increase in competence working with doctors	40 (61%)
Ideas for new projects	38 (58%)
Increase in self confidence working with doctors	36 (55%)
Increase in motivation to start new projects	35 (53%)
Increase in satisfaction with work	32 (48%)
Other changes	6 (9%)

recently (Strohkirch and Jaehde, 2003). The certificate course in clinical pharmacy at the university of Tübingen may therefore also be a model for undergraduate teaching in Germany.

The School of Pharmacy, University of London has already successfully established a joint certificate course in clinical pharmacy with a hospital in Barcelona, Spain (Mangues and Dhillon, 2000). The joint Spanish and German courses demonstrate how successful and beneficial such collaborations are. It is hoped to develop more such programmes in clinical pharmacy are implemented to promote an exchange of expertise in teaching and clinical pharmacy practice across countries.

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References

Audit Commission for Local Authorities and the National Health Service in England and Wales (2001). *A spoonful of sugar—medicines management in NHS hospitals*, London Audit Commission.

Department of Health (2000). *Pharmacy in the future—Implementing the NHS Plan*, London DoH.

Dörje, F., Orosz, P., Gonnermann, C., Blumenstock, G., & Selbmann, H. K. (1996). *Evaluierung der Beiträge eines Pharmazeuten auf Station zur Qualitätssicherung der Pharmakotherapie*. Sankt Augustin Asgard-Verlag.

Kahmen, U., & Schaefer, M. (2001). Diabetes Studie (III)—Patienten profitieren von intensiver Betreuung. *Pharmazeutische Zeitung*, *146*, 26–30.

Mangues, M. A., & Dhillon, S. (2000). A British–Spanish collaboration in clinical pharmacy teaching. *Pharmacy Education*, *1*, 55–58.

Schulz, M., Verheyen, F., Muhlig, S., Muller, J. M., Muhlbauer, K., Knop-Schneickert, E. et al. (2001). Pharmaceutical care services for asthma patients: A controlled intervention study. *Journal of Clinical Pharmacology*, *41*, 668–676.

Strohkirch, A. M., & Jaehde, U. (2003). The role of the teacher–practitioner in integrating pharmacy education and practice: A pilot project in Germany. *Pharmacy Education*, *3*, 67–71.

The School of Pharmacy (2003). *Certificate / Diploma / M.Sc. in Pharmacy Practice Handbook 2003/2004*, London The School of Pharmacy, University of London.

Vasel-Biergans, A., & Heide, L. (2000). The Certificate Course in Clinical Pharmacy at the University Tübingen and London—Evaluation of a postgraduate course for pharmacists. *Krankenhauspharmazie*, *5*, 257–258.

Wilkes, M., & Bligh, J. (1999). Evaluating educational interventions. *British Medical Journal*, *318*, 1269–1272.

World Health Organisation (1994). Role of the pharmacist in support of the WHO revised drug strategy.WHA47.12.

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Q2 Kindly provide location for the reference Dörje et al. (1996).