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**OP1****REGULATORY AND EDUCATIONAL STRATEGIES FOR REDUCING THE BURDEN ASSOCIATED WITH PRESCRIPTIONS OF SEDATIVE-HYPNOTICS**

*E. Bourcier<sup>1,2,3</sup>, V. Savoldelli<sup>2,4</sup>, C. Fernandez<sup>1,2,3</sup>, P. Hindlet<sup>1,2,3</sup>*

<sup>1</sup>Sorbonne University, UPMC Univ Paris 06, INSERM, Pierre Louis Institute of Epidemiology and Public Health (IPLESP UMRS 1136), F75012, Paris, France

<sup>2</sup>University Paris Sud – Faculty of Pharmacy – Department of Clinical Pharmacy, F92296, Châtenay-Malabry, France

<sup>3</sup>Saint Antoine Hospital (AP-HP), Pharmacy department, F75012, Paris, France

<sup>4</sup>European Georges Pompidou Hospital (AP-HP), Clinical Pharmacy department, F75015, Paris, France

**INTRODUCTION**

Benzodiazepines, z drugs and first generation histamine H1 antagonists are associated with major adverse events such as falls and cognitive impairment. Despite these considerations, the consumption of sedative-hypnotics remains high in community dwelling patients as well as in hospital where an initiation of sedative-hypnotics is reported for 8.2 to 33 % of inpatients. Our objective is to assess the effectiveness of regulatory and educational interventions designed to reduce the burden associated with sedative-hypnotic prescription.

**Material and Methods:** We conducted a systematic review of literature. A systematic search was conducted in five databases (Medline, Embase, Web of Science, PsycINFO, CENTRAL) for studies reporting regulatory or educational interventions designed to improve the appropriate use of sedative-hypnotics during the period 1980-2015. Risk of bias was independently assessed by two authors using the Quality Assessment Tool of the Effective Public Health Practice Project.

**RESULTS**

Among the 10 854 studies retrieved, 31 were eligible for the review. Twelve targeted elderly and 19 the general population. Eight trials assessed regulatory interventions and 23 assessed educational interventions. Positive results were reported in 21 studies both in elderly (10 studies) and in general population (11 studies). Educational multifaceted interventions involving healthcare professionals and patients and the support of mass media seem to be the most effective strategies. Six studies assessed potentially negative effects of the interventions and 3 actually observed clinical adverse effects or switches to other non-recommended medication. Risk of bias was weak for 4 studies, moderate for 3 studies and high for 24 studies.

**Conclusions:** Despite a moderate to high risk of bias for most of included studies, our results are consistent with literature in the field of interventions for healthcare management improvement. They highlight the importance of multifaceted interventions and prescribers and patients adherence to these interventions.

**OP2****POSTGRADUATE EDUCATION OF CLINICAL PHARMACISTS AS A NEW CHALLENGE FOR A FACULTY OF PHARMACY**

*T. Parák<sup>1</sup>, J. Csöllei<sup>1</sup>, J. Šaloun<sup>1</sup>, R. Opatřilová<sup>1</sup>, D. Leviček<sup>1</sup>, P. Suchý<sup>1</sup>*

<sup>1</sup>Faculty of Pharmacy, University of Veterinary and Pharmaceutical Sciences, Brno, Czech Republic

**INTRODUCTION**

Clinical Pharmacy is an important yet undervalued area of Pharmacy. In the Czech Republic, for every 30 hospital beds there should be on average 0,5 clinical pharmacists in intensive care and 0,1 in after-care – at present, there are virtually none. It is nevertheless indisputable that having a clinical pharmacist in a medical team improves the quality and competence of the treatment and decreases chances of harmful intervention.

**Material and Methods**

Although the Faculty of Pharmacy, UVPS Brno offers the career path of clinical pharmacist in its Master Programme Curriculum, the specialisation as defined by law takes place in postgraduate education in two stages, called “basic qualification” and “specialist qualification”. In order to ensure the quality of this education, the Faculty of Pharmacy Brno has established an Educational Institute in 2015 aimed at providing courses as part of the accredited postgradual education programme and taught by top practitioners and experts in the field.

**RESULTS**

The courses aim to increase the participants’ competence in these areas:

- Areas essential for a clinical pharmacist: complex examination, medical consultation, monitoring examination.

- A pharmacist can also take part in simple medical interventions, such as: capillary blood taking, acute care interventions, resuscitation, supportive psychotherapy, working with handicapped patients etc.

**CONCLUSIONS**

There are many issues concerning the specialisation of a clinical pharmacist that have to be dealt with in the country, such as establishing categories for individual medical interventions and their pricing in the National Medical Insurance scheme. However, by taking decisive steps in educating experts in the field, the Faculty has ensured not only the quality of the postgraduate education in Clinical Pharmacy, but also that its voice will be heard in deciding these important issues.

## OP3

### EVALUATING STUDENT PERCEPTION OF LABORATORY PRACTICAL SESSIONS FOR CLINICAL SKILLS

F. Wirth, M. Attard-Pizzuto, A. Abbas, J. Attard, J. Kupka, C.M. Namulindwa, L.M. Azzopardi, A. Serracino-Ingloft  
Department of Pharmacy, University of Malta, Msida, Malta

#### INTRODUCTION

First year undergraduate pharmacy students within the Department of Pharmacy of the University of Malta carry out five 2-hour laboratory practical sessions on various clinical skills and document activities in a developed workbook. Clinical skills include blood glucose, blood pressure and body mass index (BMI) measurement, urinalysis and administration of intradermal, subcutaneous and intramuscular injections, using point-of-care (POC) diagnostic devices and training simulators. The aim was to evaluate student perception of these practical sessions.

#### MATERIAL AND METHODS

A self-administered evaluation questionnaire consisting of five-point Likert-scale (1 strongly disagree, 5 strongly agree) and open-ended questions was developed and validated. The questionnaire was disseminated to all students (N=21) following the compulsory study unit at the end of the fifth practical session. SPSS® version 22.0 was used for descriptive statistics.

#### RESULTS

Students strongly agreed that the practical sessions help to develop competence in relevant health and safety precautions when performing clinical skills (n=16), support development of clinical skills (n=15) and provide an opportunity to relate theoretical material with practical aspects (n=11). Students also strongly agreed that tutor demonstration was helpful and instructive (n=16), sufficient time for each practical session was allocated (n=15), the workbook is well-presented (n=14) and user-friendly (n=13), and that adequate POC devices and training simulators which enhance their learning experience were available (n=12). Thirteen students found the practical session on administration of injections most interesting, while 11 students found the BMI measurement practical session the least interesting.

#### CONCLUSION

Students rated these practical sessions on clinical skills highly and perceived the sessions on administration of injections as the most interesting. Suggestions for future practical sessions to be included were cholesterol, triglycerides and haemoglobin testing.

## OP4

### PHARMACIST-ENGINEER AND PHARMACIST-ENTREPRENEUR: DOUBLE DIPLOMA AT FACULTY OF PHARMACY OF LYON, FRANCE

F. Locher<sup>1</sup>, C. Mattei-Pailler<sup>2</sup>, H.M. Späth<sup>3</sup>, C. Vinciguerra<sup>4</sup>

<sup>1</sup>Professor at the Institute of Pharmaceutical and Biological Sciences – Faculty of Pharmacy, University Lyon 1, Lyon, France – Head of double diploma “Pharmacist-Entrepreneur”

<sup>2</sup>Lecturer at the Institute of Pharmaceutical and Biological Sciences – Faculty of Pharmacy, University Lyon 1, Lyon, France - Head of double diploma “Pharmacist-Engineer”

<sup>3</sup>Lecturer at the Institute of Pharmaceutical and Biological Sciences – Faculty of Pharmacy, University Lyon 1, Lyon, France

<sup>4</sup>Dean of the Institute of Pharmaceutical and Biological Sciences – Faculty of Pharmacy, University Lyon 1, Lyon, France

#### INTRODUCTION

Since more than twenty years, the Faculty of Pharmacy of Lyon/France set up collaborations with six Engineering Schools (five in France and one in Canada) and since 2010 with a Business School in Lyon. This allows some of our students to do their fifth and sixth year mainly in these schools in order to broaden their education to complementary fields and to acquire a double diploma.

#### MATERIAL AND METHODS

From the second to the fourth year of pharmacy studies, our Faculty prepares students who would like to acquire a double diploma (1) within an Engineering School by optional courses in Mathematics and Physics and (2) within the Business School by optional courses in Social and Political Sciences. During their fourth year of pharmacy studies, these students prepare a dossier for Engineering Schools or the Business School allowing each school to select the pharmacy students who will acquire a double diploma. During their fifth and sixth year students selected by one of these Schools follow the courses of this School and do two six-month traineeships, one in a hospital and another in pharmaceutical or medical device industry. At the same time, they validate their pharmacy studies by a PharmD-Thesis.

#### RESULTS

In the last twenty years, 220 students acquired double diploma “pharmacist-engineer” and in the last two years 15 students double diploma “pharmacist-entrepreneur”. The employability of these students is very high: all students find immediately a job as a pharmacist. Most of them (95%) work in pharmaceutical or medical device industry.

#### CONCLUSIONS

Due to the high employability rate, both double diplomas are more and more attractive for our students these last years. Therefore we will continue to support the collaboration with Engineering and Business Schools in order to allow our students to acquire a double diploma within their pharmacy studies.

## OP5

### THE FIRST EXPERIENCE IN LAUNCHING OF POSTGRADUATE STUDY PROGRAMME "INDUSTRIAL PHARMACY" IN LATVIA

B.Maurina<sup>1</sup>, I.Barene<sup>1</sup>, B.Galvina<sup>1,2</sup>, M.Jure<sup>3</sup>

<sup>1</sup>Rīga Stradiņš University, Riga, Latvia

<sup>2</sup>JSC "Grindeks", Riga, Latvia

<sup>3</sup>Rīga Technical University, Riga, Latvia

#### INTRODUCTION

Till year 2015 there was no specific education for industrial pharmacists in Latvia despite the fact that among professionals such training need has never been questioned. As far as specialists employed in pharmaceutical industry need knowledge and practical experience in pharmaceutical technology, chemistry, biochemistry, etc., the Faculty of Pharmacy of Rīga Stradiņš University (RSU) together with the Faculty of Materials Science and Applied Chemistry of Rīga Technical University (RTU) created a joint postgraduate study programme "Industrial Pharmacy" supported by pharmaceutical manufacturers.

#### MATERIALS AND METHODS

There was created a working group to develop the standard for profession of Industrial Pharmacist and to define the precise knowledge, skills and competence areas. The working group included representatives of two most important pharmaceutical enterprises in Latvia "Grindeks" and "Olainfarm", academics, members of Industrial pharmacists' section of Pharmacists' Society of Latvia, members of the Association of Latvian Chemical and Pharmaceutical Industry. Curriculum of study programme and content of study courses were elaborated based on established professional standard.

#### RESULTS

Postgraduate study programme "Industrial Pharmacy" has been implemented in the academic year 2015/2016. Duration of the study programme is 1.5 academic year, total volume – 90 ECTS. Industrial pharmacy professionals are involved in the realisation of study courses "Formulation", "Good Manufacturing Practice", "Registration of Drugs". Curriculum contains traineeship (39 ECTS), conducted in Latvian pharmaceutical enterprises. Graduates of the programme will receive qualification of Industrial pharmacist.

#### CONCLUSIONS

To meet up-to-date requirements of the pharmaceutical industry industrial pharmacists should have strong pharmaceutical background, should be highly-skilled and able to work in an interdisciplinary team. This study programme is a new challenge for both universities and will enable closer links between academics and pharmaceutical industry.

## OP6

### OFFER AND ALLOCATION OF STUDENTS TO MASTER RESEARCH PROJECTS WITHIN THE MASTER'S DEGREE IN DRUG RESEARCH, DEVELOPMENT AND INNOVATION OF THE UNIVERSITY OF NAVARRA, SPAIN

A. Vettorazzi<sup>1\*</sup>, S. Pérez<sup>1\*</sup>, I. F. Trocóniz<sup>1</sup>, A. López de Cerain<sup>1</sup>

<sup>1</sup> Faculty of Pharmacy and Nutrition, University of Navarra, Pamplona, Spain

\*Equal contribution to the project

#### INTRODUCTION

The Master's Degree in Drug Research, Development and Innovation is a 25-year-old program that aims to prepare students for a professional career in pharmaceutical or related sectors. Each promotion is comprised of 20-30 people of different nationalities and education backgrounds in biomedical sciences.

The first 9 months are dedicated to theoretical and practical teaching of the phases of the drug R&D&I process. During the last 6 months, students are directly allocated to Master Research Projects (MRPs) mainly in basic research fields within the university.

#### MATERIAL AND METHODS

Since 2013-2014, a pilot study to offer new MRPs has been launched. Departments of biomedical faculties of the University, research hospitals/centers and pharmaceutical companies have been contacted. The compiled projects were offered to the students who had to rank 5 projects of their choice. The department/company was allowed to select the best candidate.

#### RESULTS

Several research/management projects in the Faculty of Pharmacy and Nutrition, Faculty of Sciences, Center for Applied Medical Research, University clinic of Navarra and in many national and international pharmaceutical companies have been offered (32 in 2013-2014; 43 in 2014-2015; 40 in 2015-2016).

Based on the drug R&D&I process, the MRPs could be divided in 5 areas (preclinical research, clinical research, quality, regulatory affairs and research management) and in 3 types (documentary, experimental-laboratory or experimental-in silico).

The system allowed a better specialization of our students through their projects, either for students who wanted to proceed with Ph.D studies or for students with management profiles.

Furthermore, the system allowed the companies/university departments to select the best candidate for each project. This, in turn, improved the employability of our students.

#### CONCLUSIONS

Based on student feedbacks, the number of research projects offered and employability of our postgraduates, this new system has been included in the curriculum of the Master's Degree.

## OP7

### EXPERIENTIAL LEARNING FOR POSTGRADUATE DOCTOR OF PHARMACY STUDENTS

F. Wirth, J. Vella, N. Sammut Bartolo, L.M. Azzopardi, A. Serracino-Inglott  
Department of Pharmacy, University of Malta, Msida, Malta

#### INTRODUCTION

Experiential learning involves the critical reflection of experiences related to selected areas of interest. The goal of such learning is to enhance professional and personal development skills using latest advances in research for updating clinical knowledge. The aim was to develop and apply an experiential learning portfolio for Doctor of Pharmacy (Pharm.D.) postgraduate students.

#### MATERIAL AND METHODS

An experiential learning portfolio consisting of a one-page written reflection form and an oral five-minute oral presentation component was developed and applied for first year Pharm.D. students. The reflection form consists of six questions and the presentation component requires students to find a recent scientific paper on the topic and focus on key points described relating it to pharmacy practice. Students were asked to select three sessions from their experience attending a local medical conference, complete a reflection form for each session selected and prepare a presentation focusing on one session.

#### RESULTS

For each reflection students indicated: 1) reason for selecting the session, 2) expectations from the learning and learning objectives achieved, 3) relevance of this learning to the safe and effective practice of pharmacy, 4) importance of the learning to them personally and to their practice, and 5) benefits of this learning. An example of how the knowledge gathered could be applied to their area of practice was reflected in question 6. Two group seminars for 18 students, led by two pharmacist preceptors, were held. During each two-hour seminar, 9 students presented their written reflections and delivered a presentation. Critical issues identified by the group and reflections on strategies to be put forward with a focus on leadership skills were discussed.

#### CONCLUSION

The experiential learning portfolio developed comprises both written and oral reflection, as well as individual and group reflection. Student evaluation of such experiential learning should be undertaken.

## OP8

### EARLY MD/PharmD PhD CAREERS

J.Delahousse<sup>1</sup>, S.Demuth<sup>2</sup>, A.Derobertmeasure<sup>1</sup>, M-G.Duperron<sup>3</sup>, T.Fourniols<sup>1</sup>, A.Frajerman<sup>4</sup>, G.Gan<sup>2</sup>, M.Hamonet<sup>5</sup>, J.Hugueny<sup>1</sup>, R. Kouoi<sup>1</sup>, S.Le Guellec<sup>1</sup>, V.Leopold<sup>6</sup>, J.Mercier<sup>7</sup>, V.Randian<sup>1</sup>, M.Scherlinger<sup>2</sup>, M.Tihy<sup>8</sup>, G.Vera<sup>9</sup>

<sup>1</sup>University of Paris Descartes, France. <sup>2</sup>University of Strasbourg, France. <sup>3</sup>University of Bordeaux, France. <sup>4</sup>University of Paris 6, France. <sup>5</sup>University of Paris 12, France. <sup>6</sup>University of Nice, France. <sup>7</sup>University of Dijon, France. <sup>8</sup>University of Paris 7, France. <sup>9</sup>Rouen Hospital, France

#### INTRODUCTION

The association gathers students around France who receive a medical or pharmaceutical training and a research training as well (master degree, PhD) in order to become a MD/Pharm-PhD to combine medical work with research. These training programs have been created to fill the lack of doctors or pharmacists in the research fields in France but also around the world. Indeed the basic sciences are essential for the progress of medicine and highlight the necessity to link research and clinical work, in others words, to go from the bench to the "bedside".

#### Material and Methods

In order to promote the double career, different strategies have been developed in France. By the second year of faculty, there are three different ways: the School of INSERM (Institut Nationale de la Santé et de la Recherche Médicale), ENS (Ecole Nationale Supérieur) and a parallel curriculum at the University (Pharmascience and Medecinescience). The involvements in these ways allow beginning an early master degree and PhD degree.

#### RESULTS

In order to help the students, an association has been created in 2009 and called Association Medecine Pharmacie Science (AMPS). A website is active (<http://www.amps-asso.fr/>) and composed by forums to share personal and professional experiences, by newsletter published every months and diverse information. Moreover AMPS organizes every year a national congress and this year AMPS organizes the fifth European congress of MD/PharmD-PhD.

#### CONCLUSIONS

Our association counts more than 200 adherents: from clinic leader to young student and every year is growing. We expected to form a network around the France and develop a good way to train pharmacist and medicine students in research. Moreover a similar association has been created last year at European level for the purpose of creating a European network and facilitating exchanges between countries.

*J. Tóth M. Kuželová, M. Dubničková, J. Klimas, P. Mučaji  
Comenius University in Bratislava, Faculty of Pharmacy, Bratislava, Slovakia*

## **INTRODUCTION**

Comenius University in Bratislava underwent a new cycle of state accreditation of university studies in 2014/15. The Faculty of Pharmacy was amongst the most successful faculties at the university with a total score of 4 points out of 4; as well as the best credited institution in the field of “medicine, pharmacy, and health sciences”.

## **MATERIAL AND METHODS**

All 13 faculties of the University underwent a process of accreditation of their study programmes, on all levels (bachelor, master, doctoral). The focus was on the scientific background of the programmes and the professors to guarantee their quality; on material, technical, and information capacities; on staff quantity and quality; on the curriculum and the credit system; on the internal quality assurance system and its implementation; as well as on the final profiling of the graduates, and job opportunities.

## **RESULTS**

Next to previously accredited doctoral (PhD.) programmes that kept their position to educate further specialists in postgraduate studies in pharmaceutical sciences – Pharmacognosy, Pharmaceutical Chemistry, Pharmacology, and Social Pharmacy/Retail Pharmacy – a newly re-accredited programme in Clinical Pharmacy was established for the future period. The new postgraduate programme will focus on training in scientific methods in the study of efficient and safe drug use, and further specialize in the fields of pre-clinical and clinical trials, clinical pharmacokinetics, acute and chronic diseases prevention and pharmacotherapy, pharmaceutical care, risks in pharmacotherapy, drug therapy faults, drug toxicology, pharmacovigilance, pharmacogenetics, and pharmacoepidemiology.

## **CONCLUSIONS**

The demand for highly specialized experts in the field of clinical pharmacy became very evident in latest years. Pharmacists are gradually becoming involved in clinical projects and activities. Clinical pharmacy is an interdisciplinary branch amongst health professions that contributes significantly to optimal pharmacotherapy, enhances quality, efficacy and safety of drug use, and leads to a cost-for-therapy decrease at the same time.

## PP1

### A STUDY ON THE CONTRIBUTIONS OF FACULTY OF PHARMACY TO POSTGRADUATE EDUCATION WITH THE-JOB TRAINING PROGRAM AND OPINION OF GRADUATES ON THAT PROGRAM

G. Ozcelikay<sup>1</sup>, Z. Ates-Alagoz<sup>2</sup>, S. Suzen<sup>2</sup>, M. Coskun<sup>3</sup>

<sup>1</sup>Department of History Pharmacy&Management, Faculty of Pharmacy, Ankara University, 06100, Tandogan, Ankara

<sup>2</sup>Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Ankara University, 06100, Tandogan, Ankara

<sup>3</sup>Department of Pharmaceutical Botany, Faculty of Pharmacy, Ankara University, 06100, Tandogan, Ankara

#### INTRODUCTION

Differentiation in health problems, changes and transformations in the health sector especially in the area of drug-pharmacy requires continuous improvement in the pharmacy profession. Post graduate training is as important as pre-graduate education, and also an important factor for providing continuing professional development of pharmacists. In this study, the importance of the job training programs organized by the Faculty of Pharmacy of Ankara University in the field of training places in order to provide continuing professional development presented.

#### MATERIALS AND METHODS

This study is a descriptive study. Study materials are obtained from questionnaires that were given to participants who attend to the job training programs organized by the Faculty of Pharmacy of Ankara University. Responses to a questionnaire to establish pharmacists' views about the job training programs will be presented in frequency tables. SPSS 160 was used to evaluate the survey.

#### RESULTS

The Turkish Pharmacists' Association and institutions such as Chamber of Pharmacists Association, Hospital Pharmacists Association and the Public Hospitals Authorities carry out the job training programs for pharmacists. In Turkey, the first job training program for pharmacists was conducted by the Ankara University Faculty of Pharmacy in 1986. The second program was consists of 26 titles including applied first aid training, social pharmacy, computer use in pharmacies was organized by Ankara University and Hacettepe University Faculty of Pharmacy in 1991. These training programs were followed by the job training programs conducted in 2010-2012 and 2015. According to programs survey results in 2010, 85.25 % of attendees have stated that program is a positive contribution to pharmacy profession, and they want these programs to be held by the university.

#### CONCLUSIONS

The job training programs plays an important role in the transformation and development after graduation. Continuous training and increasing participation would be more useful to pharmacists.

## PP2

### ANKARA UNIVERSITY FACULTY OF PHARMACY WORKSHOP RESULTS OF GRADUATES

Z. Ates-Alagoz<sup>1</sup>, G. Ozcelikay<sup>2</sup>

<sup>1</sup>Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Ankara University, 06100, Tandogan, Ankara

<sup>2</sup>Department of History Pharmacy&Management, Faculty of Pharmacy, Ankara University, 06100, Tandogan, Ankara

#### INTRODUCTION

Last year, "Alumni Workshop" was made for the first time under the 55 year celebrations by Ankara University Faculty of Pharmacy. Graduates working in different areas of employment and information they need, and training workshop report consisting of their solutions will form the content of our curriculum and will lead to us. The aim of this study was to determine the post-graduate training needs of graduates of the Faculty of Pharmacy and to make training programs.

#### MATERIALS AND METHODS

Graduated workshop report constitutes the material of this study. Alumni workshop was held with the participation of our graduates working in five different areas such as Pharmacy, Hospital Pharmacy, Public Pharmacy, Academic Pharmacy, Drug and Cosmetic Industry. Our graduates have made the reports on what they do need according to their subject matter and lack of solutions to remedy according the format given them at the end of two hours. Reports were read to the other workshop participants and faculty members and discussed and most needed-job training of the graduates have been made.

#### RESULTS

At the workshop, graduates often stated that intensive theoretical training, have had difficulties transferring this information to practical life. Also academy pharmacists stated that the lack of training in literature and reference information to reach. Public hospitals and pharmacists reported that the lack of pharmacoeconomics information in the training program. In addition, all of the graduates who participated in the study is interested in the training of information technology.

#### CONCLUSIONS

As a result, graduates are one of the most important resources for making assessments about the terms of university education. Ankara University Faculty of Pharmacy has identified postgraduate training needs in accordance with the opinion of the graduates and then the identified job training programs.



## PP3

### FLEXIBLE CONTINUOUS MANUFACTURING PROCESSES STRATEGY AND CAPABILITIES IN PHARMACEUTICAL INDUSTRY

*G.O.Ustenova, A.A.Turgumbayeva.*

*Kazakh National Medical University named after S.D. Asfendiyarov, Almaty, Kazakhstan*

#### INTRODUCTION

At the Institute of Pharmacy name of the S.Asfendiyarov Kazakh National Medical University. actively developing international cooperation in the framework of the memorandum with 21 foreign partner universities. Development and realization of joint educational programs with partner universities is carried out on the modules and coordinated by the Faculty of Pharmacy.

Currently, a joint educational program with the St. Petersburg State Chemical-Pharmaceutical Academy, which will ensure the transfer of expertise and professional competence to electronic resources. The educational program is aimed at training a new generation of leaders in the pharmaceutical industry, will allow for the exchange of best practices in the field of pharmaceutical science through modular training on Pfizer's company.

#### MATERIAL AND METHODS

In the present Education program uses the following terms and definitions: web portal, information and educational resources, network technology, case technology, content; Internet resource education organizations implementing distance education technology, information technology, distance learning and others.

#### RESULTS

The first module was held in the period from February 29 – March 4, 2016, «Flexible Continuous Manufacturing Processes Strategy and Capabilities in Pharmaceutical industry. Pfizer Quality Overview». Themes module: 1) Typical Batch process for Solid Oral Dosage vs. Continuous Manufacturing process; 2) Pfizer examples for Continuous Manufacturing : CMT, CDG and Portable, Continuous, Modular and Miniaturized Systems (PCMM ); 3) Introduction to the statistical tools used in the Pharmaceutical industry; 4) Properties and characteristics of the pharmaceutical tablet and parameters to define tablet quality; 5) Pharmaceutical company medical representative function background, overview and recent developments.

#### CONCLUSIONS

Further it is planned to hold two modules in April and May 2016 on urgent issues of modern pharmacy. After completion of the training modules will be conducted testing of students. In case of successful completion of the test students will receive a certificate from the company Pfizer.

## PP4

### THE INNOVATIVE FORM OF THE CONTROL PRACTICAL SKILLS OF GRADUATES IN THE SPECIALTY "PHARMACY"

*G.O.Ustenova., Omarova R.A., A.A.Turgumbayeva,*

*Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan.*

#### INTRODUCTION

Higher education is an one of the main priorities of the government in many countries, including the Republic of Kazakhstan. Many Universities of Kazakhstan is actively joined in the implementation of active and innovative forms of educational process, based on the final result. It is not an exception to this and the Institute of Pharmacy at Asfendiyarov Kazakh National Medical University. The basis of the educational activity of the Institute is, in particular, the introduction in the educational process of new methods of teaching with emphasis on practical skills. All of them answered for these requirements objective structured practical examination (OSPE), which was officially implemented at final state attestation in the specialty "Pharmacy".

#### MATERIAL AND METHODS

The objectives of the discipline "Pharmaceutical Chemistry" is familiarization students with the basic methods of analysis of drugs or dosage forms. Student have basics of pharmaceutical analysis, including the analysis pharmacopoeia.

#### RESULTS

The list of tasks on practical skills for OSPE in the discipline "Pharmaceutical chemistry" includes the following stages: the first stage - determination of physical and chemical properties of the proposed product; the second stage - determining identification quality indicators (transparency, color, pH, solid particles, impurities, etc.); the third stage - identification of the drug; the fourth stage - the optimal conditions quantitation of active substances in the drug; fifth stage - the storage conditions.

#### CONCLUSIONS

The innovative form of OSPE by its proximity to the professional activities of graduates, and the variability of the objectivity belongs to the category of the best abilities of the future professionals controls.

#### REFERENCE

State Pharmacopoeia of the Republic of Kazakhstan.



## PP5

### TEACHING PHARMACEUTICAL CARE AT THE BEDSIDE THROUGH INTERPROFESSIONAL APPROACH

L. Grech<sup>1,2</sup>, M. Frendo<sup>3</sup>, B. Coleiro<sup>2,3</sup>, D. Aquilina<sup>4</sup>, A. Serracino Inglott<sup>2</sup>, L.M. Azzopardi<sup>2</sup>

<sup>1</sup>Clinical Pharmacy Practice Unit, Department of Pharmacy, Mater Dei Hospital, Malta

<sup>2</sup>Department of Pharmacy, Faculty of Medicine & Surgery, University of Malta, Malta

<sup>3</sup>Department of Medicine, Mater Dei Hospital, Malta

<sup>4</sup>Rheumatology Practice Nurse, Mater Dei Hospital, Malta

#### INTRODUCTION

Offering experiential experience at the patient's bedside in an acute hospital setting exposes pharmacy students to real case scenarios and day-to-day interprofessional relationships. The aim was to develop pharmaceutical care bedside teaching to third and fourth year pharmacy students through a collaborative interprofessional approach.

#### MATERIAL AND METHODS

Undergraduate pharmacy students undertaking their clinical pharmacy experiential training are offered an experiential placement within the rheumatology field. The team led by a clinical pharmacist consists of two rheumatology specialist clinicians and a practice nurse. On their first day of the placement, the students are introduced to the clinical setting by the clinical pharmacist who briefs them on the teamwork approach and the logistic background of the placement. The students are given a rheumatology reference handbook to help them settle into the team. Students are supported to develop active participation so to ensure a fruitful academic experience.

#### RESULTS

During the placement a maximum of two students per placement, shadow the clinical pharmacist in carrying out pharmaceutical care sessions and answer participate in dealing with medicines information queries. They attend and participate all patient education sessions both those carried out on a one-to-one basis and those carried out in patient groups. The students attend the specialists clinics during the weekly out-patient clinics and the infiltration procedure clinics. The students are also exposed to the practice nurse clinics. During their placement, the students are encouraged to attend journal clubs. They are also involved in data collection of research undertaken by the team.

#### CONCLUSION

The pharmacy students learn to enhance their interdisciplinary skills, research skills and gather clinical hands on knowledge and experience preparing them for the real-life scenario.

## PP6

### PREPARATION OF PHARMACISTS TO THE ROLE OF MENTORS FOR STUDENTS COMPLETING INTERNSHIPS IN THE COMMUNITY PHARMACY

L. Bułaś<sup>1</sup>, A. Skowron<sup>2</sup>, M. Drozd<sup>3</sup>, E. Długosz<sup>4</sup>

<sup>1</sup>Department of Pharmaceutical Technology, School of Pharmacy with the Division of Laboratory Medicine, Medical University of Silesia in Katowice; Poland

<sup>2</sup>Department of Social Pharmacy, Jagiellonian University Medical College; Poland

<sup>3</sup>Chair and Department of Applied Pharmacy, Faculty of Pharmacy, Medical University of Lublin; Poland

<sup>4</sup>Department of Retail Pharmacy, School of Pharmacy with the Division of Laboratory Medicine, Medical University of Silesia in Katowice; Poland

#### INTRODUCTION

An important element of pharmacy curriculum is to provide an adequate number of the internship within the community pharmacies. The main goal of internship is to increase the students' competencies, mainly in pharmaceutical compounding and counseling. It should be highlighted that the didactic process during internship can significantly impact the students' perspective on profession. Nevertheless, the Faculties of Pharmacy have only a limited influence on the internship course and does not participate in any aspect of preparation of the community pharmacists to the role of teachers/mentors. The goal of our study was to analyze the quality of the didactic process, during the vacation internship, based on information received from the students.

#### MATERIAL AND METHODS

A survey study was conducted among the fifth-year pharmacy students, who in the preceding years had completed their community pharmacy internships. This survey consisted of 17 questions (of mostly closed type).

#### RESULTS

361 completed surveys were collected. A majority of respondents have admitted that the vacation internship provided for them an exposure on many aspects of pharmaceutical practice. Despite designation of certain pharmacists' to be responsible for the internship's course, students quite often received some professional information from others employees, including technicians. In addition, the students often indicated that there are some gaps between the theoretical knowledge (learned from the School of Pharmacy), and practice, demonstrated by personnel of the pharmacy.

#### CONCLUSIONS

The quality of the didactic process during internship requires an assessment and supervision. The pharmacists, who are mentors of students should obtain an academic support in the area of education and training to prepare them for teaching. Some topics, relevant to the responsibility for teaching of the professional pharmaceutical skills should be added to the curriculum of postgraduate pharmacy education. The didactic process should be based on close collaboration between teachers and professionals.

## PP7

### DOCTORATE OF PHARMACY STUDENTS' EVALUATION OF DRUG INFORMATION AND STATISTICS TUTORIAL

*M. Attard Pizzuto, N. Sammut Bartolo, A. Serracino-Inglott, L.M. Azzopardi  
University of Malta, Msida, Malta*

#### INTRODUCTION

The Department of Pharmacy at the University of Malta offers a three year Doctorate of Pharmacy (Pharm.D) programme in collaboration with the College of Pharmacy of the University of Illinois at Chicago. One study unit relates to Drug Information and Statistics. The aim was to evaluate a new tutorial which was introduced this year in this study unit.

#### MATERIAL AND METHODS

The 3-hour tutorial focused on pharmacist recommended use of statins and the new format of Issue 70 of the British National Formulary (BNF). During the first part of the tutorial, students were led to discuss advantages and disadvantages of having statins as pharmacist-recommended medications. In the second part of the session, students were given seven case studies where they had to use the BNF as the primary source of information. Students were provided with an evaluation sheet at the end of the tutorial to rate, on a 5-point Likert scale, their reflections on the demonstrator's presentation and to answer questions directly related to the tutorial set-up.

#### RESULTS

Fourteen students from a total of seventeen participated in the tutorial. Twelve strongly agreed that the presentation was well prepared and organised. Eleven students strongly agreed that the demonstrator appeared knowledgeable about the subject, encouraged student participation and presented up-to-date developments in the field. Twelve students claimed they found the discussions related to statins and the new BNF format as engaging and they felt they could apply what they learned during the taught modules into practice.

#### CONCLUSION

This evaluation demonstrates that the students found value in the tutorial organised. The Doctorate of Pharmacy programme aims to give students skills in critical thinking and literature analysis which could be applied in decision-making for selecting drug therapy and evaluating new drugs.

## PP8

### HISTORICAL OVERVIEW OF PHARMACIST POSTGRADUATE EDUCATION IN LATVIA

*S. Lauze, B. Mauriņa, V. Sidlovskā  
Faculty of Pharmacy of Riga Stradiņš University, Riga, Latvia*

#### INTRODUCTION

In organization process of pharmacist postgraduate education in Latvia the Pharmacists' Society of Latvia (LFB) and higher education institutions are involved. LFB has introduced a system of competences based continuing education for community pharmacists, but Riga Stradiņš University implements the study programs in industrial and clinical pharmacy. Historically, pharmacist postgraduate education was influenced by various political events in Latvian territory.

#### MATERIAL AND METHODS

Materials of research are used from Latvian State Archive and periodical press of XX century. Research is descriptive and retrospective.

#### RESULTS

The first independent Latvian Republic existed from November 18, 1918 to 17 June 1940. The regulatory framework issued in 1938 mentioned the Pharmacists' Society of Latvia as responsible authority for pharmacist knowledge. From 1938 to 1940 the pharmacist Augusta Maizīte (1894-1966) organized five education courses for pharmacists, pharmacist assistants and trainees. In 1944 Latvia was re-occupied by the Soviet Union. Starting with the 1948 year, the Main pharmacy administration (GAP) started intensively developed pharmacist further training. Pharmacy managers were instructed to organize the pharmacy staff skill enhancement. In 1944 many Latvian inhabitants fled as refugees. To prepare for work the Latvian pharmacists in exile, International Refugee Organization (IRO) headquarters located in Geneva in 1950 organized educational training courses. From 1950 most of the Latvian pharmacists emigrated from West Germany to USA, where a large proportion continued to work in their profession.

#### CONCLUSIONS

Pharmacist postgraduate education in Latvia was seen as important already in the 30s of XX century. But the XX century political events prevented the creation of unified post-graduate education system. In 1962 Riga Medical Institute was opened further training faculty to doctors and pharmacists, where started systematic postgraduate training.

## PP9

### STUDENT EVALUATION OF COURSEWORK FOR PHARMACEUTICAL TECHNOLOGY MODULES

*N. Sammut Bartolo, M. Attard Pizzuto, J. Vella, A. Serracino-Inglott, L.M. Azzopardi  
Department of Pharmacy, University of Malta, Msida, Malta*

#### INTRODUCTION

A class presentation related to a real case scenario was introduced in two study units related to pharmaceutical production processes to increase student participation during lectures.<sup>1</sup> This study aimed to evaluate students' perception towards the developed presentations.

#### MATERIAL AND METHOD

A self-administered questionnaire was disseminated to students after the presentations were held. The questionnaire consisted of seven closed-ended questions using a 5-point Likert scale, ranging from strongly agree to strongly disagree, and two open-ended questions. The close-ended questions evaluated the tasks performed and skills developed. The time allocated for each session and whether the experience helped for future presentations were also evaluated. In the open-ended questions students were asked to state which part of the task they enjoyed doing the most and if they have further suggestions for future presentations.

#### RESULTS

Six out of 10 students following the module answered the questionnaire. Five agreed that the assigned task reflects material covered during lectures and 4 agreed that the exercise helped them to understand lectures better. Four agreed that the exercise stimulated them to learn more about the subject. All participants agreed that their presentation skills were improved. The majority agreed that their confidence was improved (n=4), are better prepared for future presentations (n=5) and that the time allocated was suitable (n=5). The presentation (n=3) and research part (n=2) were rated as being the most enjoyable task. One student suggested including more assignments in the course.

#### CONCLUSIONS

The presentations were positively received by students. The tasks given stimulated students to learn more and understand better the theory presented during lectures. Skills developed will help students in their future professional career.

#### LITERATURE REFERENCE

1.Sammut Bartolo N, Vella J, Serracino-Inglott A, Azzopardi LM. Increasing student participation and theory application in pharmaceutical technology lectures. EAFP conference, Athens, 2015.

## PP10

### INDUSTRIAL PHARMACY VISITS FOR PHARMACEUTICAL TECHNOLOGY STUDENTS

*N. Sammut Bartolo, M. Attard Pizzuto, J. Vella, A. Serracino-Inglott, L.M. Azzopardi  
Department of Pharmacy, University of Malta, Msida, Malta*

#### INTRODUCTION

Academic visits to pharmaceutical industry sites are organised as part of study units related to pharmaceutical production processes to introduce students to the real pharmaceutical scenario and to expose them to experiential learning. During visits students are shown how the daily activities are performed. They have the opportunity to see and learn about the equipment used for processes and analysis and to learn about the documentation system used. This study aimed to evaluate students' perception towards the visits.

#### MATERIAL AND METHOD

Students evaluated the three visits by means of a self-administered questionnaire. The questionnaire consisted of seven closed-ended questions using a 5-point Likert scale, ranging from strongly agree to strongly disagree. The questionnaire evaluated the relation between the site visited and subjects studied, students' expectations and knowledge gained.

#### RESULTS

Six out of 10 students following the study units answered the questionnaire. All participants agreed that sites visited related to the subject studied. Five agreed that the visits met their expectations. Visits were found to be useful to apply principles learned during lectures (n=6) and to experience the importance of following Good Laboratory and Good Manufacturing Practice guidelines (n=5). All participants agreed that through the visits they gained more knowledge related to the application of instrumentation. Five participants agreed that the industrial visits helped them understand better how the pharmaceutical industry works. All participants agreed that the activity was enjoyable.

#### CONCLUSIONS

The introduction of academic industrial visits to pharmaceutical technology students helped students to better understand concepts and processes and to familiarise with activities performed on a daily basis.

**INTRODUCTION**

Orthopedics is one of the services offered by some community pharmacies. The higher life expectancy and aging population needs support to avoid and treat mobility problems, arthritis, bones or muscle injuries. Pharmacists in the field of orthopedics strengthen the surveillance system for patients using medical devices and prevent adverse incidents these products may generate.

**MATERIAL AND METHODS**

This postgraduate course is for pharmacists in office, pharmacists that have years of experience and students that have got 240 ECTS. Practical training took place with patients affected by mobility problems associated to both their lower and upper limbs, back and neck or those with gait disturbances. The course consists of six modules held for six weeks concluding with the development of a monographic work and oral defense thereof.

**RESULTS**

Table 1 summarizes the results corresponding to the answers given by students of the last four courses to the following questions:

1. Are you safer at recommending orthotics in community pharmacy?
2. Do you have orthopedics section in the pharmacy?
3. Do you have orthopedics in a separate establishment from the Pharmacy?
4. Do you make insoles?
5. Do you have a section for technical aids?

Table 1

Question	2011-2012	2012-2013	2013-2014	2014-2015
1	100%	100%	100%	100%
2	92%	100%	65%	100%
3	77%	0%	34%	60%
4	17%	0%	39%	30%
5	67%	100%	43%	40%

**CONCLUSIONS**

A course in Orthopedics for pharmacists has been offered by the University of Alcalá for over 15 years. Aims of the course include improvement of anatomical, physiological, technological and health legislation knowledge and acquisition of new capacities and skills for the design, manufacture, technical adjustment and dispensing of ortho-prosthetic products. All these will contribute to provide adequate patient and pharmaceutical care. From its origins more than 1,000 students have been trained.

## PP12

### IMPLEMENTATION OF A BREWING SCIENCE AND TECHNOLOGY MASTER AS A POSTGRADUATE PROGRAM IN THE SCHOOL OF PHARMACY

M.V. Aguilar<sup>1</sup>, A. García<sup>2</sup>, J. Molpeceres<sup>1</sup>, M. C. Guinea<sup>1</sup>, L. Villaescusa<sup>1</sup>, F. Ortega<sup>1</sup>

<sup>1</sup>School of Pharmacy. University of Alcalá, Madrid, Spain

<sup>2</sup>ESCEMA Foundation

#### INTRODUCTION

The multidisciplinary background acquired with the Pharmacy Degree provides pharmacists with a broad base in Food Science and Technology (Orden CIN/2137/2008). In fact, 13.5% of pharmacists attached as Spokespersons to the General Council of Pharmaceutical Associations of Spain work in food related industries. In order to improve their academic background and to facilitate their employability in the food industry this master in Beer Science and Technology was offered.

#### MATERIAL AND METHODS

An evaluation and analysis of the six academic editions of the master have been carried out. In addition, satisfaction surveys conducted by ICE-UAH at the end of each course have been considered. They give an idea about student satisfaction and identify the weaknesses to be improved. ([http://www3.uah.es/ice/UTC/documentos/encuesta\\_satisfaccion\\_alumnado.pdf](http://www3.uah.es/ice/UTC/documentos/encuesta_satisfaccion_alumnado.pdf).)

#### RESULTS

The master has been taught on average to  $12.17 \pm 3.70$  students/year, (Fig. 1), coming from 12 different countries (Table 1) being  $18.32 \pm 6.79\%$  women. Most of the students (71.4%) chose this master based on the need for qualified professionals in this field.

Figure 1

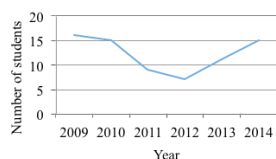


Table 1. Students' countries of origin (%).

Angola	Argentina	Brasil	Chile	Costa Rica	Ecuador	Spain	Honduras	Mexico	Nicaragua	Peru
1.36	4.11	6.85	2.74	2.74	10.96	63.04	1.36	1.36	2.74	2.74

Students reported high satisfaction rates with the program, particularly related to manufacturing of different types of beer in pilot scale. The average mark was  $8,19 \pm 0,39$  out of 10.

#### CONCLUSIONS

The master on Beer Science and Technology has achieved the following issues:

- Creation of spaces for reflection and debate
- Project development with high scientific and technological innovation
- Adherence to the sustainability idea by using surplus production and saving energy resources
- Opportunities for business collaboration

## PP13

### STEPWISE LEARNING FROM FIRST YEAR TO POST-GRADUATE STUDIES OF PHARMACY DEGREE

E. Caballero, M. Valero, R. Sepúlveda, R. Álvarez, M. del Arco

Faculty of Pharmacy, University of Salamanca, 37007-Salamanca. Spain

#### INTRODUCTION

During the Degree studies, the students should acquire the specific knowledge needed for developing adequately the professional and post-graduate training. On this base, an important milestone of any degree is the level acquired by the students in the first year. Then, the transition from secondary school to the degree seems to us to be a crucial step in the learning chain for the exploitation of the degree resources.

#### MATERIAL AND METHODS

This study is focused on demonstrating the influence of the previous level in chemistry, physics and mathematics on the marks of the first semester of Pharmacy Degree, by means of:

- (1) Evaluation of the knowledge in topics needed for a better understanding of the first year subjects.
- (2) Comparison of these results with the marks of the first semester.

#### RESULTS

We have used the new subject Scientific Methodology and Research as a reference to demonstrate how the number of students that succeed in the subject, is slightly but concomitantly increased as the score in the initial test increases; whereas in any of the other subjects that use concepts from basic areas (Mathematics, Chemistry and Physics), a strong increase in the success is observed along improving the marks obtained in the initial test.

#### CONCLUSIONS

Considering the university learning as a chain process, it is important the establishment of a milestone of knowledge at the beginning of the degree. It could help improving the yield and quality of the students in Post Graduate studies in Pharmacy Education.

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## PP14

### EXPERIENCE WITH MASTER DEGREES IN THE FACULTY OF PHARMACY OF THE UNIVERSITY OF SALAMANCA

A.I. Morales, R.I.R. Macias, C.I. Colino, M.A. Castro, E. del Olmo, P.A. García, A. Muro  
Faculty of Pharmacy, University of Salamanca, Spain

#### INTRODUCTION

The Faculty of Pharmacy of the University of Salamanca offers four Official Master's programs linked to different speciality areas of Pharmacy: Master in Evaluation and Development of Drugs, Master in Cellular and Molecular Pathophysiology and Pharmacology, Master in Tropical Diseases and Master in Chemistry and Pharmacy of Natural Products. A summary of characteristics and results after five years of experience with these Master's degrees is presented.

#### MATERIAL AND METHODS

Information was obtained from Directors of Masters and the Evaluation of Quality Unit of the University of Salamanca.

#### RESULTS

The Masters are organized in 60 credits over one year, except the Master in Chemistry and Pharmacy of Natural Products, which is organized in collaboration with the Polytechnic Institute of Bragança (Portugal) and requires 120 credits to develop two years. The Master in Evaluation and Development of Drugs offers two specialties: i) Design, Development and Evaluation of Drugs, with a research orientation and ii) Management and Manufacturing in Pharmaceutical Industries, with a professional orientation. The other three Masters are also oriented to the research pathway. The number of places offered per year varies between 20-40, and students can choose between Final Master Projects focused on research projects in the laboratory or literature review projects.

Around 80-160 students have obtained the Master Degree in each program of 60 credits in five years and between 96-99% of enrolled students completed their Master Degree in one year. About 30 students have obtained the Master Degree in Chemistry and Pharmacy of Natural Products and this academic year will finish the fourth batch of students. The percentage of foreign students varies between 15-40% depending on the program.

#### CONCLUSIONS

The wide variety of Master's programs has generated a considerable interest among our and foreign students and has remained steady from year to year. *Supported by Ayudas a proyectos de Innovación y mejora docente USAL (ID2015/0258, ID2015/0189 and ID2015/0235).*

## PP15

### POSTGRADUATE EDUCATION PROGRAM FOR "PHARMACY MANAGEMENT"

B. Sözen Şahne<sup>1</sup>, Z. Çalgan<sup>1</sup>, G. Gülpınar<sup>2</sup>, M. B. Uzun<sup>2</sup>, N. Tarhan<sup>2</sup>, E. G. Taşkıran<sup>3</sup>,  
B. Aksu<sup>4</sup>, G. Özçelikay<sup>2</sup>

<sup>1</sup> Hacettepe University Faculty of Pharmacy Ankara, Turkey

<sup>2</sup> Ankara University Faculty of Pharmacy, Ankara, Turkey

<sup>3</sup> Ege University Faculty of Pharmacy, İzmir, Turkey

<sup>4</sup> Kemerburgaz University Faculty of Pharmacy, İstanbul, Turkey

#### INTRODUCTION

There are 25 pharmacy faculties providing education in Turkey. In these faculties, qualifications related to the field of "Social, Behavioral and Administrative Pharmaceutical Sciences" stated in Turkish National Pharmaceutical Sciences Education Programs Accreditation Standards and Instructions, and which is a main component of core education program, are aimed to be ensured by the courses provided by Department of Pharmacy Management. These are the courses such as Pharmacy Management, History of Pharmacy, Pharmacy Ethics and Patient-Pharmacist Communication.

However, all of the pharmacy faculties do not have a Department of Pharmacy Management. Instructors having PhD in this field are present only at Ankara, Hacettepe, Ege, İstanbul, Marmara and Erciyes Universities. Instructors of other disciplines provide these courses at other universities. This constitutes an obstacle to homogeneity in providing these courses.

#### MATERIAL AND METHODS

Therefore, "Pharmacy Management Workshop" was carried out by participation of the instructors providing these courses, in June 2015 in order to ensure homogeneity and increasing quality of these courses. Some decisions were made at the end of this workshop, and proceeded to the implementation stage. In particular, the curriculum of Pharmacy Management and necessary actions to standardize postgraduate education programs were determined.

#### RESULTS

In this study, the determined curriculum, and the education program under its scope will be presented, and the results will be discussed by taking the postgraduate programs for Pharmacy Management in other countries into account.

#### CONCLUSIONS

As a conclusion, the number of instructors is inadequate because of the fact that only Ankara and Hacettepe Universities have doctoral programs in the field of Pharmacy Management. "Pharmacy Management Workshop" carried out in 2015 was a beginning for the developments in this field. The curriculum determined during this workshop was provided to all Faculties, and homogeneity of the content of the courses was ensured.

## PP16

### ERASMUS: AN OPEN WINDOW FOR FUTURE PHARMACEUTICAL STUDIES

*A.Kopsini, M.Kazakou*

*National and Kapodistrian University of Athens, Athens, Greece*

#### INTRODUCTION

Since the first years of our studies, the complexity of pharmaceutical science was obvious and well realized. Pharmacy was no more equivalent only with selling drugs in a community pharmacy.

#### METHODS

The combination of many different scientific fields, such as medicine, biology, chemistry and the very unique part concerning drugs, all presented at the same time, consists a science extremely special with unlimited opportunities. But sometimes this variety makes students confused about their future pharmaceutical path. Do I have to follow postgraduate studies? If yes in which field? In which country? Can I do it? Do I have the skills? What I want to do in my life? And there it comes Erasmus to change everything. We asked students from our faculty to share with us their Erasmus experience and fill a questionnaire concerning its influence in their future studies.

#### CONCLUSION

The answers were clear and a new approach for postgraduate studies, research and academic career was the common point for everyone. More opportunities. More collaboration with scientists from different fields and countries. Erasmus changes lives.

## PP17

### DRUG MARKETING STRATEGIES IN TURKEY: AN ETHICAL EVALUATION OF ANTIHYPERTENSIVE DRUGS REGISTERED BETWEEN 2005-2013

*Y.Ç. Keçeli,*

*G. Gülpınar,*

*G. Özçelikay*

*Ankara University Faculty of Pharmacy, Ankara, Turkey*

#### INTRODUCTION

Drugs are being registered according to Human Medicinal Products Licensing Regulations enacted in 2005, 19 January in Turkey. The numbers and utilization rate of drugs being registered between 2005-2015 will be determined. Considering the numbers of drugs registered by FDA and EMA, marketing strategies of drugs will be evaluated in an ethical perspective.

#### MATERIAL AND METHODS

Materials of this study are the antihypertensive drugs registered between 2005-2013 by Ministry of Health and the IMS reports. Licenses are observed in 4 criteria as produced in Turkey, imported licenses, one active ingredient and combined drugs.

#### RESULTS

There are 548 hypertensive drugs being registered between 2005-2013. Some of them (272) have single active ingredient, 276 of them are combined drugs. 431 of these antihypertensive drugs were registered as manufacturing license and 117 of them were registered as import license. Maximum 32 licenses warranted of a single active ingredient Valsartan. 37 licenses warranted of combined ingredients Valsartan and Hydrochlorothiazide. Single active ingredient, Olmesartan Medoxomil, preparation registered max. 9 times. In addition, 8 imported licenses warranted of a combined ingredients Amlodipine and Atorvastatin. The unit prices of drugs are not differentiated much. On the other hand, 20 hypertensive products do not have any sales in 2013. Sales of imported products often have a greater share figures.

The applications were made but 62 single and combined antihypertensive drugs not yet registered. The number of registered single active ingredient antihypertensive products by FDA is 305, combined preparations is 158. The number of registered single active ingredient antihypertensive products by EMA is 19, combined preparations is 20.

#### CONCLUSIONS

In conclusion, drug licensing should be encouraged not only to increase the number of registered antihypertensive drugs but also to provide to market safer, more effective ones.



## PP18

### USE OF WEB INTERACTIVE MULTIPURPOSE SERVER IN MEDICINAL CHEMISTRY EDUCATION

A. Hamze<sup>1</sup>, J. D. Brion<sup>1</sup>, B. Perrin-Riou<sup>2</sup>

<sup>1</sup>Laboratoire de Chimie Thérapeutique, Equipe Labellisée Ligue Contre le Cancer, LabEx LERMIT, Faculté de Pharmacie, Université Paris-Sud, CNRS, BioCIS-UMR 8076, 5 rue J.-B. Clément, Châtenay-Malabry, F-92296 Paris, France

<sup>2</sup>Laboratoire de Mathématiques d'Orsay, Faculté des Sciences d'Orsay, Université Paris-Sud, F-91405 Orsay, France

#### INTRODUCTION

Internet is used more and more in education and research. Apart from the Internet smartphones and tablets have emerged which are also being used more and more frequently in education. The objective of this work is to propose an interactive platform to study with fun, medicinal chemistry courses.

#### METHODS

In 2013, to illustrate the Medicinal Chemistry courses for students DFGSP3 (3rd year of Pharmacy) in the EU 17 (Drugs from synthetic and natural origin), we decided to use the "WIMS, Web Interactive Multipurpose Server" platform to create interactive digital lessons in Medicinal Chemistry. This project is especially in the form of multiple choice questions (MCQ) for associating the structures of active ingredients with different targeted pathologies. In addition to that, other teaching resources concerning drug synthesis addressed different therapeutic classes.

#### RESULTS

By using this platform, the student can find a personalized workspace and have access to a self-assessment through an exercise program. These educational resources WIMS were incorporated into instructor-led training (3rd year), where students can acquire the pedagogical basis indispensable for the success of the final review of the UE17. Following the sessions, students gained significant confidence and they spent more and more time for learning medicinal chemistry. This project WIMS in Medicinal Chemistry course was endorsed by the AFECT (Association Française des Enseignants de Chimie Thérapeutique, Association of Medicinal Chemistry teachers in France).

#### CONCLUSIONS

Didactic core courses can be modified to accommodate the change in courses and the latest updates. Considerable time was required to prepare this type of platform; however, this work was very highly rated by students indicating that this was preparatory time well-invested.

## PP19

### POSTGRADUATE STUDIES AT THE SCHOOL OF PHARMACY, UNIVERSITY OF EASTERN FINLAND

J. Rautio<sup>1</sup>, R. Pellinen<sup>1</sup>, P. Honkakoski<sup>1</sup>

<sup>1</sup>School of Pharmacy, University of Eastern Finland, Kuopio, Finland

#### INTRODUCTION

School of Pharmacy is part of the Faculty of Health Sciences at the University of Eastern Finland's Kuopio campus. The Faculty has approximately 580 doctoral students in four doctoral programmes. The School of Pharmacy is hosting a Doctoral programme of drug research<sup>1</sup> and coordinating it in collaboration with FinPharmaNet network<sup>2</sup>. The Doctoral programme of drug research has about 70 postgraduate students. 10-15 new students will be enrolled each year, and approximately 10 students are graduated yearly.

#### MATERIAL AND METHODS

During application process, a student draws up a research plan with a supervisor at the school and applies to the faculty for the right to pursue doctoral studies. Once the application is processed by the doctoral programme, the faculty grants the right to pursue doctoral studies, appoints supervisors and approves the research plan.

#### RESULTS

In the beginning of doctoral studies, a student submits the personal postgraduate study plan (HJOPS) to the faculty, and performs studies described in HJOPS. In order to get the postgraduate degree, total of 40 points of studies defined in the degree structure (e.g., transferable skills studies 5-15 points, and studies in the discipline and field of research 25-35 points) are required.

The main part of the postgraduate studies is the thesis -doctoral dissertation- carried out under supervision of supervisors and completed in the main field of the study. The doctoral dissertation must demonstrate that the student has deep acquaintance with the field of research, with related scientific fields and with general scientific theory. In addition, the dissertation must show the student's ability to apply, independently and critically, the methods of scientific research in one's field of research and the ability to produce new information independently. An approved doctoral thesis can be either a single research study published as a monograph or a sufficient number of scientific publications or manuscripts accepted or submitted for publication. Before graduation, a postdoctoral student defends his/her dissertation against an external opponent in the public examination that is open to the general public.

1 <http://www.uef.fi/en/web/dpdrugresearch/home>

2 <http://www.fdpd.fi/>

## PP20

### LONGITUDINAL AND TRANSVERSAL COORDINATION OF THE TRAINING PLACEMENTS WITHIN THE COURSES THAT COMPOSE THE STUDY PLAN OF THE PHARMACY DEGREE AT THE UNIVERSITY OF SEVILLA

*M.M. Orta, J. Sánchez, M. Álvarez de Sotomayor, A. Jos, J.M. Vega  
University of Sevilla, Sevilla, Spain*

#### INTRODUCTION

In the Faculty of Pharmacy of the University of Sevilla, before the incorporation of the students to the mandatory training placements, they have to attend a one week seminar in relation to the skills and capabilities they have to acquire during their stay in community pharmacy or hospital pharmacy. The correct coordination of this subject with the others included in the same study plan is an important task in order to avoid overlappings. Moreover, evidences of a good coordination are required for accreditation purposes.

#### MATERIAL AND METHODS

Every academic year different coordination activities take place. Meetings between subjects coordinators of the Degree are organized under the direction of the Vice dean of Academic Affairs. Improvement opportunities are identified and corrective decisions are made.

#### RESULTS

The training placements are the subject where the students have the opportunity to practice all the knowledge, competences and skills previously acquired. Among the disciplines included in our study plan there are a wide number with a direct interaction on the training placements such as Pharmacology, Public Health, Pharmaceutical care, Toxicology, Clinical Pharmacy, Physiopathology, etc.

#### CONCLUSION

The coordination mechanisms applied and the decisions made have allowed to improve the quality of the seminars of the students attending the training placements.

## PP21

### INTERNATIONAL STUDENTS MOBILITY IN THE FACULTY OF PHARMACY OF THE UNIVERSITY OF SEVILLA (SPAIN)

*D. Gutiérrez-Praena, R. Martínez de Pablos, A. Ramos, S. Pichardo, A. Jos, J.M. Vega  
University of Sevilla, Sevilla, Spain*

#### INTRODUCTION

In the Faculty of Pharmacy of the University of Sevilla four different degrees are available for students: Degree in Pharmacy, Degree in Optics and Optometry, Double Degree in Pharmacy and Optics and Optometry, and Master Degree for Professional Specialization in Pharmacy. Internationalization is one of the main goals for the University of Sevilla. Thus, the International Relations team of the Faculty of Pharmacy is working on the consolidation of a wide and attractive mobility offer, through academic bilateral agreements, that allows the intellectual enrichment of our students, as well as to host incoming students looking for a personal and academic experience in a University with more than 500 years.

#### MATERIAL AND METHODS

An analysis of the current mobility offer for outgoing students of the Degree of Pharmacy has been performed. Moreover, drawbacks and strengths have been identified.

#### RESULTS

For the 2016/17 academic year, 125 students could benefit from an international experience in 16 different countries in Europe and Latin America. However, not all positions will be covered mainly due to language requirements. Italy, followed by France and Portugal are the main receptors of our students. The experience is evaluated as highly satisfactory for the students.

#### CONCLUSION

The analysis performed suggests that language skills must be promoted among our students in order to increase the mobility. Also, the incorporation of new proposals would be welcome in the frame of the Erasmus+ Program. The Faculty of Pharmacy invites potential partners to visit our web page ([www.farmacia.us.es/movilidad](http://www.farmacia.us.es/movilidad)) and to contact us at [erasmusfarmacia@us.es](mailto:erasmusfarmacia@us.es).

## PP22

### DEVELOPMENT OF AN EXPERIENCE-BASED MASTER'S PROGRAMME IN CLINICAL PHARMACY IN NORWAY

G. H. Thoresen, H. Schultz and H. Christensen  
School of Pharmacy, University of Oslo, Oslo, Norway

#### INTRODUCTION

Incorrect use of medications has major implications for patients and society, and the Norwegian authorities emphasize the importance of increased involvement of pharmacists in multidisciplinary teams around the patients in nursing homes and hospitals, as well as in the community pharmacy setting. Recently a bill passed the Norwegian Parliament on this issue. To fulfill the increasing needs for clinical pharmacy expertise in Norway, School of Pharmacy at the University of Oslo has developed an experience-based master's programme in clinical pharmacy.

#### MATERIAL AND METHODS

To participate in the programme the student must have a basic pharmaceutical education (bachelor or master) from a university or a university college. In addition, she or he is obliged to have at least two years of relevant work experience, i.e. as a pharmacist in community pharmacy or hospital pharmacy.

#### RESULTS

The master curriculum is a part-time programme, consisting of 90 credits, comprised of 6 individual courses, each of 10 credits, and a thesis of 30 credits. The courses may be completed in individually tailored order and over a time period of maximum 6 years, in order to make the programme flexible for the students. Compulsory courses constitutes of 30 credits, while the remaining 30 credits are optional specialization courses. The compulsory courses cover e.g. clinical pharmaceutical methodology, clinical communication, clinical biochemistry in relation to drug use, as well as pharmacological variability and individualized drug therapy, while the specialization courses cover various pharmacotherapeutic areas.

#### CONCLUSION

The Master's thesis has quality-assured drug use as the primary goal, and the work with the thesis are based on interdisciplinary collaboration and is generally a patient-centered project.

## PP 23

### PhD PROGRAMS ASSOCIATED TO THE FACULTY OF PHARMACY OF SALAMANCA UNIVERSITY (SPAIN)

A. Muro, E. del Olmo, M.A. Castro, R.I.R. Macías, E. Caballero  
Faculty of Pharmacy, University of Salamanca, 37007-Salamanca. Spain

#### INTRODUCTION

The Faculty of Pharmacy of Salamanca offers three PhD programs in Social Sciences and Health under the agreement of the EEES: Pharmacy and Health  
Pathophysiology and Pharmacology  
Health and Development in the Tropics

#### MATERIAL AND METHODS

The information was obtained from directors of the programs and the Evaluation of Quality Unit of the University.

#### RESULTS

Programs last for three years, to a maximum of five years. Some of the topics that the students can follow are:

Pharmacy and Health: Design, synthesis and evaluation of bioactive compounds; Chemoinformatic and molecular modeling; Pharmacokinetics-pharmacodynamics of antibiotics; Clinical Pharmacokinetics and Drug Monitoring; Development and evaluation of pharmaceutical forms; Polyphenol effects on diet and health; Pharmacoepidemiology or Pharmaceutical care among others.

Pathophysiology and Pharmacology: Damage of cardiovascular and renal systems and endothelial dysfunction; Cardiovascular pharmacology; Neuroendocrinology and obesity; Drug targeting and chemoresistance; Pathophysiology of exocrine pancreas; Redox signaling in hematological malignancies; Regenerative medicine.

Health and Development in the Tropics: Development of vaccines against helminthes; Molecular diagnosis of helminthiasis; Vector-borne diseases; Synthesis and evaluation of compounds against various infectious and parasitic diseases (Leishmaniasis, malaria, chagas); HIV immunopathogenesis, Antimicrobial resistance and microbiological diagnosis; Medical anthropology or cultural epidemiology.

In the last five years more than 150 students have followed those studies and over 64 have obtained their PhD with Honours.

#### CONCLUSIONS

The programs offer to the PhD candidates the most advanced research and training, first-class facilities, a variety of international connections, as well as a stimulating environment that will open up plenty of opportunities for a successful career in academic or industry research.

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*Del Castillo-Rodriguez, Carlos & Del Castillo-Garcia, Benito  
Faculty of Pharmacy. Universidad Complutense, Madrid (Spain)*

- Council Directive 85/433/EEC of 16 September 1985 concerning the mutual recognition of diplomas, certificates and other evidence of formal qualifications in pharmacy, including measures to facilitate the effective exercise of the right of establishment relating to certain activities in the field of pharmacy
- 1986, Greece, Portugal and Spain, incame in the European Union.
- 1988, Benito del Castillo is elected Dean of the Faculty of Pharmacy of Universidad Complutense de Madrid.
- 1992, creation of the European Association of Faculties of Pharmacy (EAFP) in the Université Paris-Sud (France) por Charles Soleau (+), Pierre Bourlioux, Odette Santos Ferreira, Atilla Hincal, Benito del Castillo, Paul Breimer, Alexander Florence, Lennard Paalzow, et al.
- 1994, Lisbon FIP (Portugal),European Pharmacy Specialization.
- 1998, New Orleans (USA), FIP-World Congress on Pharmacy Education.
- 2000, Granada (Spain), Directions in World Pharmacy.
- 2001, Calabria (Italy), New Advances in Pharmaceutical Care.
- 2002, Benito del Castillo is both President of Conferencia Nacional de Decanos de Facultades de Farmacia de España (CNDFFE), President of Conferencia Hispanoamericana de Facultades de Farmacia (COHIFFA) and President of the Academic Section of the International Pharmaceutical Federation (AS-FIP).
- 2003-2006, President of the European Association Faculties of Pharmacy.
- May 2004, entried into the European Union of Lithuania, Estonia, Latvia, Czech Republic Slovenia, Slovakia Hungary , Poland , Cyprus and Malta.
- 2004, Sarajevo (Bosnia and Herzegovina), Harmonization of Pharmacy Curricula.
- Declaration of Malta which were established the basis for the enactment of the Directive 2005/36 of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications including Pharmacy, with the help of the President of Malta (pharmacist).
- 2006, Tartu (Estonia), EAFP, Legal Aspect of Education and Mutual Recognition of Qualifications.
- 2008, new curriculum of the Graduate in Pharmacy in the Universidad Complutense de Madrid.
- 2008, Honorary Dean of the Faculty of Pharmacy of UCM and Honorary President of CNDFFE.
- 2011, joint meeting of the COIFFA and EAFP where Benito del Castillo was electe in Lisbon (Portugal). Honorary President of the EAFP.