INTERNATIONAL SCIENTIFIC SUMMER SCHOOL INITIATIVE: SUPPORTING INTERNATIONAL NETWORKING AND COLLABORATION

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Resume. The formal training in doing research is lacking in most of the medical training programs. Incorporation of the "doing research" subject into curricula varies considerably among countries, and also among universities within countries. The very beginning of the postgraduate clinical career is in "internship" or "residency" training; characterized+- by gaining practical knowledge, following clinical guidelines and compliance with the "the best clinical practice" that is a healthcare quality indicator. It was shown that students' involvement in research during medical school is associated with not only postgraduate research involvement, but more effective medicine practice based on evidence-based medicine.

However, the need for training "how to do research" is frequently either not sufficiently recognized, or there is no adequate/ sufficient space in overloaded under- or postgraduate medical curricula.

It was also an experience in the editorial office of the journals. During the peer-review process, many rejected papers had creative ideas and potentially interesting/ applicable results; however their design did not achieve the requirements for proper academic writing. Recognizing this problem, the Journal of Electrocardiology commenced an initiative of the International Scientific Summer Schools and implemented the interactive method of research training .

We describe in this paper the interactive method on how to prepare project and how to do research and share our experience with implementation of scientific summer school.

Key words: scientific research, postgraduate education, interdisciplinary research, publishing

ИНИЦИАТИВА МЕЖДУНАРОДНОЙ НАУЧНОЙ ЛЕТНЕЙ ШКОЛЫ: ПОДДЕРЖКА МЕЖДУНАРОДНЫХ СЕТЕЙ И СОТРУДНИЧЕСТВО

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Резюме. В большинстве програм медициской подготовки недостаточное значение уделяется формальному обучению "как проводить научное исследование". Включение предмета "как проводить научное исследование" в программу обучения значительно различаеться между странами и университетатми в каждой данной стране. Интернатура и ординатура\аспирантура являються началом последипломной клинической карьеры и характеризуються как процесс приобретения практических знаний, следования клиническим протоколам и соответствия "наилучшему клиническому применению", который являеться индикатором качества здравоохранения. Было показано, что участие студентов в научном исследовании во время обучения в медициских институтах ассоциировалось не только с их участием в последипломных научных исследованиях но также более эффективной клинической практикой основанной на принципах доказательной медицины.

Однако, проблема необходимости в обучении " как проводит научное исследование" недостаточно признана, и\или ей уделяеться неадекватное\недостаточное место в загруженных до- и последипломных программах медицинского

образования.

Это также прослеживается и в опыте редакционного совета журнала Электрокардилогии. Во время процесса независимого реферирования, многие отклоненные статьи имели творческие\оригинальные идеи и потенциально интересные применимые результаты, однако их дизайн не соответствовал требованиям гармоничного академического изложения. Признавая существование данной проблемы, журнал Электрокардиологии начал инициативу Международной Научной Летней Школы где применяется интерактивный метод подготовки “как проводить научное исследование”.

В данной статье мы описываем интерактивный метод как подготовить научный проект, как проводит научное исследование и делимся нашим опытом по проведению научных летних школ.

Ключевые слова: научное исследование, последипломное образование, междисциплинарное исследование, издательство

ЭЛАРАЛЫК ИЛИМИЙ ЖАЙКЫ МЕКТЕБИ ДЕМИЛГЕСИ: ЭЛАРАЛЫК ТАРМАКТАРДЫ КОЛДОО ЖАНА КЫЗМАТТАШУУ

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Корутунду. Медициналык даярдоо программаларынын көпчүлүгүндө “илимий изилдөөнү кантип жүргүзүү керек” формалдык окуутуусуна жетишээрлик маани бөлүнбөйт. “Илимий изилдөөнү кантип жүргүзүү керек” сабагын окутуу программасына киргизүү өлкөлөрдүн жана университеттердин арасында бир кыйла айырмачылыктары бар. Интернатура жана ординатура\аспирантура дипломдон кийинки клиникалык мансаптын башталышы болуп саналышат жана практикалык илимдерди алуу процесси катары мүнөздөлөт, клиникалык протоколдорго алып келүү жана саламаттык сактоонун сапатынын индикатору болуп эсептелген “эң жакшы клиникалык колдонууларга” далкелет. Студенттерди медициналык институттарда окутуу учурунда илимий изилдөөлөргө катыштыруу дипломдон кийинки илимий-изилдөөлөрдө алардын катышуусу менен гана эмес далилденген медициналык принциптеринен негизделген эффективдүү клиникалык практика менен көрсөтүлгөн.

Бирок “илимий изилдөөнү кантип жүргүзүү керек” окутуу зарылдыгынын маселеси жетиштүү таанылган эмес, жана \ же ага медициналык билим берүүдө дипломго чейин жана дипломдон кийинки программаларда шайкеш келбеген \ жетиштүү эмес орун берилет. Булар ошондой эле The Journal of Electrocardiology редакциялык кеңешинин тажрыйбасында да байкалган. Көз карандысыз реферат жүргүзүү учурунда көбүнчө кабыл алынбай калган статьялардын ичинен чыгармачыл \ оригиналдуу идеялар жана потенциалдуу кызыктуу колдонулуучу натыйжалар кездешкен, бирок алардын кооздому академиялык баяндоолордун талаптарына дал келген эмес. Бул маселенин бар экендигин эске алып The Journal of Electrocardiology “илимий изилдөөнү кантип жүргүзүү керек” интерактивдүү даярдоо ыкмасын колдонуучу Эларалык Илимий Жайкы Мектеби демилгесин баштады.

Негизги сөздөр: илимий изилдөө, дипломдон кийинки билим алуу, сабак ичинде изилдөө, басма

Lifelong education is an essential component of successful medical professional career and is recognized as a “*condition sine qua non*”. This represents basically two interrelated processes: self-learning and sharing experience by “teaching” others.

During both general and medical university studies,the learning process prevails. Dominant parts of curricula are specific didactic courses. The formal training in doing research is lacking in most of the medical training programs [1]. Incorporation of the “doing research” subject into curricula varies considerably among countries, and also among universitieswithin countries. It is frequently limited, not perceived as a priority [1, 2]. Indeed, the “student-investigator” is typically only an assistant to the “faculty-investigator”, with no expectation of leadership in the creation of a first-author peer-reviewed scientific publication.

The very beginning of the postgraduate clinical career is in “internship” or “residency”

training; characterized by gaining practical knowledge, following clinical guidelinesand compliance with the“the best clinical practice” that is a healthcare quality indicator. Everyday care for patients generates many questions about diagnosis, treatment and prognosis. However, this leaves insufficient time to cope with identified gaps in knowledge and weak/ missing points of guidelines that are paradoxically natural outcomes of increased clinical knowledge and practical experience.

Research is frequently perceived as a “theory” as oppose to “practice”. However, it was shown that students’ involvement in research during medical school is associated with not only postgraduate research involvement, but more effective medicine practice based on evidence-based medicine [3, 4].It needs to be stressed thatintensive progress in medicine, including the “best clinical practice” recommendations, is due to research, that scientific research is a global issue, and that this process requires prepared professionals [5-9]. However, the need for training “how to do research” is frequently either not sufficiently recognized, or there is no adequate/ sufficient space in overloaded under- or postgraduate medical curricula.

Sharing the results of research in the global scientific community is exposed to increasing demands and expectations on the quality of the manuscripts submitted. Many research manuscripts are not of sufficient quality and/or interest to pass the strict peer-review process of international scientific journals. Consequently, a majority of even completed medical research is not published, and does not reach those who could potentially benefit from the results [10, 11].

It was also an experience in the editorial office of the Journal of Electrocardiology. During the peer-review process, many rejected papers had creativeideas and potentially interesting/ applicable results;however their design did not achieve the requirements for proper academic writing. Recognizing this problem, the Journal of Electrocardiology commenced an initiative of the International Scientific Summer Schools (IntSSS). In collaboration with the Croatian Medical Journal the first IntSSS, was organized in Slovakia in 2006 [12]. Then, in 2007, the 2ndIntSSS was organized in Turkey with enthusiastic involvement of the Anatolian Journal of Cardiology [13]. These initial experiences have resulted in an ongoing stimulating partnership.

Currently, this initiative has been supported by a group of scientific journals that have also recognized the need for such training: Journal of Electrocardiology, Anatolian Journal of Cardiology, Balkan Medical Journal,Medical Monitor of the Slovak Medical Society, Hippokratia, Monitor of Medicine of Slovak Medical Society, Lietuvos Bendrosios Praktikos Gydytojas (Lithuanian Family Doctor) and MEDICINA.These Journals are thus actively involved in workingwith the scientific community by training young scientists as potential authors and reviewers of research papers, with the final aim to increase quality of published papers and of the of the peer-review process[14]. The IntSSS is an open initiative and new journals, which are interested to join us, are welcome.

The standard IntSSS program consists of four daily workshops:

1. Workshop 1: Introduction to research proposal
2. Workshop 2: Research design and methods I: Study population and outcomes
3. Workshop 3: Research design and methods II: Data collection and analysis
4. Workshop 4: Research administration

Participants are working in groups, and experience a process of elaborating and presenting a study protocol for a common research project. This process requires the selection of an adequate study design, appropriate methods of data collection, analysis and interpretation, development of a feasible study plan and timeline for the project, stressing also an importance to includea preparation of a research paper.A number of skills are thus trained: effective listening, reasoning, argumentation, providing and accepting peers’ critique, presentation of interim draft productions/ results and a gradual building of one common protocol.

In given time periods the groups present results of their discussions however preliminary/ draft the outcomes are, and are trained to benefit from the feedback from faculty (mainly during the first workshop) and from the participants who can thus train their skills in critical appraisal and in providing feedback. In this way, they build gradually their Study Protocol on the selected topic for the final more formal presentation.

This program was originally developed by Galen S. Wagner and Eric Eisenstein at the Duke University, Durham, North Carolina, USA, as a part of a broader educational curriculum for clinical practitioners, postgraduate trainees and medical

students working on their individual research projects, Duke University is well known for having a specific training program for clinical research [15]. Later, it was successfully appliedalso in an international environment [16].The IntSSSorganizers adapted the program according to perceived needs and introduced two major changes: working in groups and additional optional discussion.

The groups are carefully created to achieve and international and interdisciplinary balance. The benefit of interdisciplinary research is recognized [17] and IntSSS organizers encourage participation not only medical but also biomedical students/ professionals. Working in international interdisciplinary groups provides environment for training additional necessary skills required for potential international collaboration and international team building, such as negotiation, cross-cultural and interdisciplinary communication, and the last but not least – to enhance the knowledge of English language.

The additional optional program includes *ad hoc* discussions on topics such as: how to prepare a manuscript, how to communicate with an editor/ editorial office, the destiny of a submitted manuscript in an editorial office, how to deal with reviewers' comment, details of a process from submitting a manuscript to its publication. Since the senior members of the IntSSS faculty are editors of scientific journals, they can share their expertise and respond to concrete questions.

The training methods used at the IntSSSare based mainly on problem- based and learning-by-doing approaches, with a stress on the face-to-face and group discussions. The arrangement of the program is rather different from the "classical" classroom lectures, where teachers or mentors are "the best source of knowledge" and it is a new experience for those accustomed to a classroom teaching that is still a preferred method of education.

Since the year 2006, eleven IntSSSs were organized in six countries (Slovakia, Turkey, Poland, Romania, Croatia, Macedonia) [18-27]. The total number of trainees reached 264 from 28 countries (Table 1), creating a solid base for an international network of young scientists and their mentors.

The IntSSS organizers are naturally interested in the outcomes of the training. The scientific performance of trainees was evaluated for the period 2007 – 2013 [28], articles published in peer-reviewed journals indexed in PUBMED and SCOPUS databases during this period were analyzed. Data of 123 participants of the total 168 trainees were available for analysis.It was shown that considering number publications before and at least 1 year after participation in IntSSS, number of citations, and Hirsch index for articles published after IntSSS, the IntSSS training was associated with identifiable increase in scientific publication activity.

The nine-year experience with eleven IntSSSs organized shows that IntSSSprovides an interdisciplinary international environment for training skills required for preparing research study protocols, scientific manuscript and international collaboration and represents a flexible format for efficient complementary international training of young researchers.

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Table 1: The list of participants' country of residence (in alphabetic order).

Albania	Estonia	Lithuania	Serbia
Austria	Georgia	Macedonia	Slovakia
Bosnia and Herzegovina	Greece	Netherlands	Spain
Brazil	Hong Kong	Poland	Sweden
Croatia	Hungary	Portugal	Turkey
Czech Republic	Kosovo	Romania	Ukraine
Egypt	Kyrgyzstan	Russia	USA

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