

# IMPLEMENTING IDEAS FOR THE MEDICAL RESEARCH DEVELOPMENT. A CROSS-SECTIONAL STUDY

F. TRIPON<sup>1\*</sup> A. GHEORGHIU<sup>1</sup> G. NEMEŞ<sup>1</sup>  
A. MOLDOVAN<sup>1</sup> V.G. MOLDOVAN<sup>1</sup> M.D. PAŞCA<sup>1</sup>

**Abstract:** Nowadays research increased significantly, as a result there has been a growth in the number of publication and we found out this process to be consistent between our university staff and students. Therefore important questions regarding research arose, such as: What obstacles do they encounter in order to complete the research? Is there any sort of guidance for students? Are there any grants for this purpose? What can we do for the medical research development in our university regarding both students and university staff? The objective of this study was to answer the questions mentioned above. We implemented two types of questionnaires with multiple answers which were filled in by 520 students and 120 university staff members. Results: 31.49% of students were involved in medical research and the main obstacle encountered by 40.25% of them was the fact that they did not do research in their field of interest. 59.40% of university staff members specified as an important obstacle: the lack of medical equipment/ reagents. In order to develop a better research program for students, 54.80% (n=251) required courses/workshops, 48.03% (n=220) research assistance for students and 43.01% (n=197) internal grants and financing for research projects. More research grants were the main issue for medical research development raised by 51.48% (n=52) university staff members. Conclusion: We believe that by fulfilling the specifications mentioned in the results section, there could be an increased and improved medical research program in our university and not only.

**Key words:** Medical research, research development, student research.

## 1. Introduction

We have to understand the concept of research, which is defined as “a creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humans, culture

and society, and the use of this stock of knowledge to devise new applications” [7] or a “careful study of a subject, especially in order to discover new facts or information about it” (Oxford English dictionary).

Nowadays, research findings and

---

<sup>1</sup> University of Medicine and Pharmacy Tîrgu Mureş, Romania.

\*Correspondent author: tripon.florin@umftgm.ro

evidence based results guide us to solve complex problems with an accurate and professional approach. It also brings the awareness for certain biases and risks which we should take into consideration, rises new hypotheses, shows statistically significant conclusions in which we can rely on and also new concepts which need to be further investigated.

We can say that we live in an era of research and our actions prove this. In our university the interest for research increased significantly over the past years for both students and staff, as the rector's final year report shows. For instance, the number of participants to the International Congress for Students and Young Physicians, Marisiensis, and the PhD students' and Post-Doc's Conference of our University has grown from year to year. Considering this observation, we started to question the reasons and the main interest behind this.

In a research program there are at least two participants: the research coordinator and the student. Certain questions arose, such as: What obstacles do they encounter in order to complete the research? Is there any sort of guidance for students that could help them finish their research study? Did their coordinators provide them with materials? Are there any grants for this purpose?

The objective of this study was to answer the questions mentioned above but the main goal was to find better insights for developing a research program in our university and have a proper conclusion to „What can be done for developing research in the University of Medicine and Pharmacy Tîrgu Mureş?” regarding both students and university staff.

## 2. Material and Methods

University staff from 26 departments and students from the Faculty of General

Medicine (2nd to 6th year of study) were our focus in this cross-sectional study. Students from the 1st year were not our target because the scientific knowledge is minimal in that group.

Two questionnaires were designed, one with 11 items specifically addressed to the university staff, filled in by 120 people and one made up of 10 items to which 520 students responded. Both questionnaires offered multiple choice answers as well as a blank space to optionally fill in personal thoughts in order to obtain more honest opinions.

Data was collected from 45 assistant professors, 30 lecturers, 12 associated professors, 15 professors and 80 students from 2<sup>nd</sup> year, 115 from 3<sup>rd</sup> year, 105 from 4<sup>th</sup> year, 138 from 5<sup>th</sup> year and 51 from 6<sup>th</sup> year. Due to the lack of complete answers, 18 university staff and 31 student questionnaires were eliminated from further statistic investigation.

Regarding confidentiality, it could not be fully preserved, as precise information was required in the university staff questionnaires, such as department, position in university and gender, data that could easily reveal the person who completed the questions. As a result, we informed the university staff about this issue and we received their consent to use the data in our study.

Both questionnaires had a special approach. If a student answered A to the first question the entire questionnaire had to be filled in. But if the answers were B or C only questions 2, 3, 5 and 10 needed to be answered to. On the other hand, if the student responded D to the first question, no further completion was necessary. In case of the teaching staff questionnaire, if question 6 was answered with C, only the last question needed further completion.

## 3. Results

The majority of students who completed the questionnaire were females 71.16% (n=348), whereas the university staff questionnaire was filled in by 54.90% females (n= 56) and 45.10% males (n=46).

Questions, variants and overall results for both questionnaires are presented in Table 1 and Table 2.

Out of the total number of students who performed research (31.49%, n=154), 13 students were from 2<sup>nd</sup> year, 23 from 3<sup>rd</sup> year, 34 from 4<sup>th</sup> year, 50 from 5<sup>th</sup> year and 34 from 6<sup>th</sup> year. The complete results regarding the number of students, their involvement in research program and the year of study are presented in figure 1.

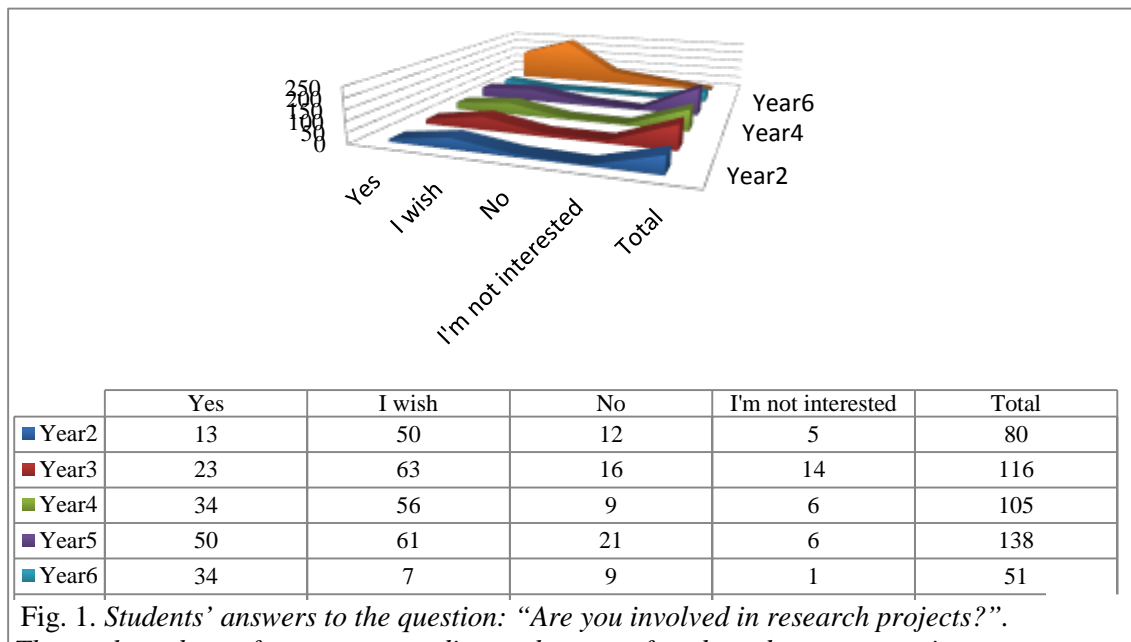


Fig. 1. Students' answers to the question: "Are you involved in research projects?". The total numbers of answers according to the year of study and response variants.

From the total number of students involved in research, 40.25% (n=62) of them did not perform research in their field of interest, 56.45% (n=35) were refused by 1 coordinator, 14.51% (n=9) by 2 coordinators and 19.35% (n=12) were refused by more than 2 research coordinators. On the other hand, 48.46% (n=237) of the students who filled in the questionnaire would have preferred to be involved in research but from those 16.45% (n=39) were refused by 1 coordinator, 10.54% (n=25) by 2 coordinators and 8.01% (n=19) by more than 2.

From the 13.70% (n=67) of students not performing research at the moment of questioning, 20.89% (n=14) were refused

by 1 coordinator and 2.98% (n=2) by more than 2 coordinators.

Students were interested in performing research in Cardiology 12.42% (n=57), Pathology 8.97% (n=41), General surgery 6.12% (n=28), Paediatrics 5.9% (n=27), Genetics 4.81% (n=22), Urology 4.81% (n=22), Physiology 4.59% (n=21), Internal medicine 2.84% (n=13), as well as Orthopaedics 2.84% (n=13) and most of these disciplines were able to cover the high demand from students. The number of available positions, university staff requirements in selecting students and working materials available for students are presented in Table 3.

The majority of students, regardless of their involvement in research, agreed that

for a better development of this area more courses and workshops from different medical fields should be introduced.

Most of the students who worked in research (81 from 154) need project financing through internal grants. University staff encountered several obstacles in their research work, the results being illustrated in Table 2; for instance filtering their answers with regard to colleagues collaboration, we observed that 66.66% (n=12) of the ones who chose this answer were males and 33.33% (n=6) females, but what concerned us was the fact that the answers were from 11 different departments.

Out of the total number of university staff who did not encounter obstacles, 80% (n=8) are assistant professors and 20% (n=2) lecturers. On the other hand, several members of the university staff (n=8) selected all options for the no. 2 question (Table II). Other obstacles encountered in 5.88% (n=6) were: lack of cooperation with patients, small number of available researchers and university staff who do not engage in research projects.

As our results show, 11.76% (n=12) of the university staff members did not coordinate a student, but they were willing to do so and therefore offered between 2 to 5 student research positions at the following departments: Genetics, Histology, Dermatology, Anatomy, Paediatrics, Internal Medicine, Urology and Laboratory Medicine; these positions were offered in 91.66% (n=11) of cases by assistant professors and in 8.34% (n=1) by lecturers.

There were some university staff members who coordinated students and had no available position for students, such as: 8 out of 10 members from Intensive Care Unit, 1 out of 5 members from Anatomy, 1 out of 10 members from Paediatrics, 2 out of 6 members from

Pathology, 1 out of 18 members from Internal Medicine, 1 out of 10 members from General Surgery and 1 out of 4 members from Cellular Biology; on the other hand, 10 university staff members had between 5 to 10 available positions, as follows: two members from General Surgery and Urology, and one university staff from Pathology, Neurology, Dermatology, Orthopaedics, Paediatric orthopaedic surgery and Biochemistry departments.

More research grants were the main issue raised by 52 university staff members, followed by poor interdisciplinary collaboration (n=11), lack of interdisciplinary courses (n=9) and medical equipment (n=7).

Other aspects in need of improvement were also mentioned, such as: complete restructuration of the entire research system in our university, removal of the current one-grant limitation, motivation, students' work quality included in the university's staff promotion criteria, official recruitment of students in research projects besides volunteering.

#### 4. Discussions

Given the fact that there are multiple possible communication methods between students and their coordinators as well as the wide range of research materials available, we assume that there is a good and beneficial collaboration between university staff and students, yet there are several obstacles encountered. University staff members mentioned the lack of reagents, medical equipment and the difficulty to access research grants, which we believe could be overcome by a guideline which provides methods for obtaining research grants. In the scientific literature there are guidelines to support and direct researchers' work; for example

Table 1

*Students' answers*

No.	Question	Variants	Results
1	Are you involved in research projects?	A) Yes	154
		B) I would like to be	237
		C) No	67
		D) It's not an interest for me **	31
2	What determined you to get involved in research?	A) I have always wanted	29
		B) Experience/personal development	377
		C) Scholarships/prizes	74
		D) Encouragement/motivation from the university staff	43
		E) It's a trend	22
3	Your field of interest is? Please specify the department	A) Preclinical	165
		B) Medical department	265
		C) Surgery	173
4*	How did you choose your assistant coordinator?	A) It's from my field of interest	92
		B) It's not from my field of interest but offered me support	40
		C) I appreciate his/her work	41
		D) I didn't find anyone else	5
5	How many assistant coordinators refused to help you?	A) 0	342
		B) 1	87
		C) 2	35
		D) >2	33
6*	What kind of support did the coordinator offer you for your research work?	A) Medical resources and advice	122
		B) Only medical resources	5
		C) Only advice	21
		D) It was slightly detached	10
7*	Means of student-coordinator communication:	A) Organized meetings	125
		B) E-mail/phone	102
		C) Scientific sessions	11
		D) Internship	23
8*	The research database starts from:	A) Medical history and observation files	111
		B) Medical equipment/reagents	36
		C) Experimental animals	17
		D) Questionnaires	48
9*	Choosing the research field:	A) It was my idea	78
		B) It was the only option available	13
		C) It was the coordinator's idea	72
		D) Other answers....	4
10	What do you think could be changed in order to develop the research among students?	A) More scientific sessions	214
		B) Research assistance for students	220
		C) Courses/workshops	251
		D) Internal grants and financing for research projects	197
		E) Exchange of experience between university centres	130

Multiple answers can be selected for each statement.

\*The results of this questions are from 31.49% (n=154) of students

\*\*If this answer was chosen the student didn't have to further complete the questionnaire.

Table 2

*University staff answers*

No.	Question	Variants	Results		
1	You're involvement in research activity has the following motivation:	A) Personal satisfaction	64		
		B) Aggrandizement	37		
		C) Financial motivation	2		
		D) Academic accreditation	43		
		E) It's a trend	7		
2	Have you encountered any obstacles in your research work? If so, please specify which of the following:	A) Financial problems	39		
		B) Lack of collaboration with co-workers	18		
		C) Problems in obtaining research grants	49		
		D) Lack of medical equipment/reagents	60		
		E) Other obstacles.....	6		
3	What is your opinion about the level of research work at this moment: 1) inside of your discipline area? 2) among students?				
		A) High level	A) High level	10	10
		B) Medium	B) Medium	39	19
		C) Sufficient	C) Sufficient	37	40
		D) Insufficient	D) Insufficient	16	32
4	Do you think that students' implication in research is needed?	A) Yes	101		
		B) No	0		
		C) I don't know	1		
		D) I'm not interested	0		
5	Research approach among student is beneficial in:	1) The preclinical stage	95		
		2) The Clinical stage	66		
6	Are you/ have you ever been an assistant coordinator for students?	A) Yes	85		
		B) No, but I would be interested	12		
		C) No, and I am not interested	5		
7	In choosing your research-involved students, do you use any selection criteria?	A) No	35		
		B) Yes, I use the following.....	59		
8	How many available positions for students do you have?	A) 0	15		
		B) Between 2 and 5	75		
		C) Between 5-10	10		
		D) Over 10	0		
9	What are the steps in choosing the research subject?	A) It's up to the student	29		
		B) I always choose	48		
		C) Other options.....	37		
10	What medical material do you provide the student in order to support his research work?	A) A good number of patients	56		
		B) Medical journals	57		
		C) Observation files/medical history and laboratory results	84		
		D) Medical equipment/reagents/ experimental animals	39		
		E) Questionnaires	44		
		F) Professional medical literature	75		
11	What do you think it could be changed in order to develop the research among students?  And what about in the medical staff case?	A) More scientific sessions	44		
		B) Research assistance for students	41		
		C) Courses/workshops	57		
		D) Internal grants and financing for research projects	73		
		E) Exchange of experience between university centres.	54		

Multiple answers can be selected for each statement of table 2.

Andrew A. McAleavey et al. “provides a brief overview of the challenges and current solutions and substantial obstacles to overcome, but there remain numerous challenges in day-to-day operations” [6]. Other authors also offer solutions for large-scale collaborations between researchers and practitioners, as well as for successful partnerships between clinicians and researchers [3].

There are differences between worldwide university research protocols regarding opportunities, obstacles as well as advantages and our university’s need for a personalised guideline with advices and answers for a successful project outcome. Students also face obstacles, such as the refusal of their chosen department due to the high number of requests for research positions in contrast to the limited number of available positions. Interestingly, as our results showed, in our university there are still several available research positions, yet students do not address those departments or members of the university staff.

On the other hand, although numerous students are involved in research projects, a number of them are working outside their field of interest.

This is an issue which could have further consequences, as Lindsey M. Greco claims in her study: “career obstacles all had direct negative relationships with occupational satisfaction”[4]. Starting with this observation, we want to highlight the importance of a much higher number of research coordinators guiding the students through their work. There are authors who saw the importance of this matter stating: “For students or beginning researchers, the absence of a good supervisor, providing face-to-face, one-to-one feedback is a major handicap.

In busy university department, you (as student) may need to use your initiative to secure guidance specific to your needs”

[5]. In order for a substantial development in research to occur in our university, the university staff require more grants, students demand project founding and specific guidance as well as workshops are in great need for the ones who get started. International universities possess research guidelines for students and/or research beginners, discussing topics like: “do your groundwork”, “meet your supervisor”, “understand the requirements”, “brainstorming for topics”, “plan your project schedule and objective”, “refine your research aim”, “understand ethics, privacy, anonymity and confidentiality”, “read, take notes and write up as you go along”, “conduct a literature search, if required, do a literature review”, “choose your research tools”, “conduct your research and collect data”, “compile, analyse and interpret your data”, “write a first draft of your report, read, redraft and proof your report”, “submit your research project on time and to requirements”[2].

McAleavey et al. have identified two fundamental resources for research development: “Time (and a lot of it) and people (and a lot of them)”.

A paper published by Brazilian students concluded that for the development of research program more time should be invested, as well as the need for implementing guidelines [8]. Scientific research starts to be a part of our professional work and for this reason it is necessary to embrace these ideas as the future generation is the one who will represent the research filed in our university, while the current generation has the responsibility to contribute to its development, to provide advices, ideas, help, guidance and solutions. This situation is mutually advantageous, as senior researchers have the scientific know-how while the „students have resources that most professionals, clinicians, and academicians, are short of: up-to-date

knowledge of methodological and all, time and energy” [1].  
statistical advances and, most precious of

Table 3

*The number of interested students for each department*

Departments	Interes- ted stud- ents	Available research positions*	Requirements	Materials for students
Pathology	41	11-25	No students from 6 <sup>th</sup> year of study, involvement, punctuality, seriousness, 15% of staff had no requirements	Medical history/medical tests, professional literature, medical equipment, medical journals
Genetics	22	6-15	Involvement, seriousness, perseverance, handiness, 33% of staff had no requirements	Medical equipment, reagents, medical history, professional literature
Internal medicine	13	20-40	Involvement, seriousness, motivation, availability, 50% of staff had no criteria	Medical history/tests, professional literature, patients, medical journals
Cardiology	57	14-20	Involvement, seriousness, 15% of staff had no criteria	Medical history/tests/journals
Paediatrics	27	14-30	University grades, motivation, seriousness, 33% of staff had no requirements	Medical history/tests, questionnaires, professional literature
General surgery	28	24-50	Motivation, 50 of staff had no criteria	Patients, medical history/tests, professional literature
Urology	22	20-45	Urology knowledge, involvement, motivation, spontaneity, 40% of staff had no criteria	Medical history/tests, professional literature, patients, questionnaires
Orthopaedics	13	9-20	100% of staff had no requirements	Patients, medical history/tests, medical journals, questionnaires
Anatomy	10	8-20	100% of staff had no requirements	Medical history/literature, medical journals
Intensive Care Unit	6	4-10	Team work, involvement, interest in intensive care	Journals/literature, medical history, questionnaires
Cellular biology	1	6-15	Interview, involvement in cellular biology	Medical history/literature, questionnaires
Biochemistry	4	11-25	Interview, involvement in biochemistry	Equipment, literature, reagents
Paediatric surgery	13	9-19	Motivation, spare time, university grades	Patients, medical history/literature
Dermatology	6	11-25	Interest in dermatology	Patients, medical history
Pathophysiology	12	4-10	Interest in Pathophysiology, motivation	Journals/literature, medical history/ tests
Histology	9	10-25	Interest in Histology, seriousness	Journals/literature, medical history/tests, reagents
Laboratory Medicine	1	10-25	Interest in Laboratory Medicine, seriousness	Journals/literature, medical equipment, reagents
Neurology	26	11-25	Interest in Neurology, motivation, University grades	Patients, medical history, journals/ professional literature



Departments	Interes- ted stud- ents	Available research positions*	Requirements	Materials for students
Endocrinology	13	4-10	Interest in Endocrinology	Patients, medical history/literature
Microbiology	4	4-10	Interest in Microbiology	Journals, literature, reagents
Pharmacology	6	15-29	Involvement, Availability	Reagents, journals, literature
Ophthalmology	7	4-10	Interest	Medical history, journals/literature
Otorhinolaryngology	2	4-10	Involvement	Med history/literature
Pulmonology	1	6-15	Interest in Pulmonology , University grades	Medical history/ tests, literature
Psychiatry	18	4-10	Interest in Psychiatry, involvement	Medical history, journals/literature

\* Minimum and maximum number of available positions in each department after data collection from all interviewed department members.

We believe that by fulfilling the specifications mentioned above, there could be an increased and improved medical research program, not only in our university, but in others as well.

## 5. Conclusion

According to our results the main reasons for students' implication in medical research were personal interest, future professional development and scholarships /prizes while for the university staff desire was the main basis.

The main obstacles encountered by the university staff were the lack of reagents and medical equipment, besides the need for more research grants or project founding, while students faced the refusal of their chosen department and the necessity for specific guidance, implementation guidelines, workshops or courses.

As a future strategy, our university needs an increased number of university staff research coordinators, especially in departments where the number of interested students surpasses that of available research positions.

## References:

1. Adelman, R.W., Castonguay, L.G., Kraus, D.R., Zack, S.: *Conducting research and collaborating with researchers: The experience of clinicians in a residential treatment center*. In: *Psychother Res.* (2015) 25 (1), p. 108-120.
2. Bell, J., Waters, S.: *Preparing the ground*. In: *Doing your research project: a guide for first time-researchers*, 6th edition, Bell, J., Waters, S. (eds.). McGraw-Hill Education, NY, 2014, p. 5-92.
3. Castonguay, L.T., Youn, S.J., Xiao, H., Muran, J.C., Barber, J.P.: *Building clinicians-researchers partnerships: Lessons from diverse natural settings and practice-oriented initiatives*. In: *Psychother Res.* (2015) 25(1), p. 166-84.
4. Greco, L.M., Kraimer, M., Seibert, S., Sargent, L.D.: *Career Shocks, Obstacles, and Professional Identification among Academics*. In: *Acad Manage Proc.* (2015) Meeting Abstract Supplement, p. 1.
5. Martin, B.D., Nathan, H.: *Planning your research project*. In: *Doing a successful research project: using qualitative or quantitative methods*,

- second edition, Martin, B.D., Nathan, H. (eds). Palgrave Macmillan, London, 2014, p. 11-15.
6. McAleavey, A.A., Lockard, A.J., Castonguay, L.G., Hayes, J.A., Locke, B.D.: *Building a practice research network: Obstacles faced and lessons learned at the Center for Collegiate Mental Health*. In: *Psychother Res.* (2015) 25(1), p.134-51.
  7. OECD: *Basic Definitions and Conventions*. In: *Frascati Manual- Proposed standard practice for surveys on research and experimental development*, 6th edition, OECD (eds). OECD publication, Paris, 2002, p. 29-30.
  8. Oliveira, C.C., de Souza, R.C., Sasaki Abe, H.E., Silva Móz, L.E., de Carvalho, L.R., Domingues, M.A.C.: *Undergraduate research in medical education: a descriptive study of students' views*. In: *BMC Med Educ.* (2014) 14, p 51.