An Investigation and Analysis on Medical Undergraduates’ Participation in Scientific Research: A Case Study on Hubei University of Medicine

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ABSTRACT

Taking Hubei University of Medicine as an example, the survey uses the questionnaire survey of undergraduate students in accordance with the sampling method, which designed to collect the opinions and obstacles the lower- and intermediate grades of medical undergraduate students have on Scientific Research, and to understand the current situation they participate in Scientific Research and the key factors influencing students' participation in Scientific Research activities. The survey aims to provide important references for strengthening the cultivation of students' ability in scientific research, and for entering the Scientific Research hall as soon as possible through summarizing some suggestions of stimulating medical undergraduates to participate in research activities by interviewing the experienced predecessors, such as the research type teachers and hospital professors.

KEYWORDS

Medicine; Undergraduate; Scientific research current situation; Promotion; Reference.

INTRODUCTION

The scientific research project of college students is an effective form and important way to cultivate college students' innovation ability, scientific research ability and practical ability. At present, it has become a kind of talent training way which is generally recognized at home and abroad [1]. The current international medical career is booming, the education of medical students in China closely follows the international form, and train applied talents, so the atmosphere of scientific research prevails. But many medical freshmen hovering in the front of the scientific research,
they often meet with a refusal in the initial stage, or ignorant of scientific research preparation, or anxious and do not know the choice direction of project, or cannot find fellow friends even after hundred search. These are likely to be problems that a new medical freshmen will encounter in scientific research threshold, in order to help team members to improve themselves, more help the majority of undergraduate students into the research hall as soon as possible, one's mind freely 'study' summer social practice team will 'explore scientific research path, provide scientific research entry guide' as the theme to carry out practical research.

OBJECT AND METHOD

Respondents: students of junior and middle grade school who are interested in scientific research but do not know how to participate in scientific research; survey content: by investigating the students’ scientific research awareness and views, and collect students who are interested in scientific research pay those efforts, and cause what confusion, what obstacles are encountered, meanwhile want to get what aspects of the promotion and exercise through research; statistical methods: use SPSS 17.0 software to carry out statistics and analysis for the survey data.

SURVEY RESULTS

A total of 600 questionnaires were distributed in this questionnaire, effective recovery is 568 copies. The survey results show that the participation conditions of scientific research of undergraduates are statistically significant for different grades and different college students’ differences in scientific research participation rate, the low participation rate of scientific research is related to the fact that students are not aware of scientific research projects, lack scientific research consciousness, lack scientific research conditions and so on.

Survey object distribution: according to statistical analysis, the respondents mainly are concentrated in the freshman year, sophomore year, girls are relatively more, the students who are interested in scientific research are clinic, pharmacy, biology and other professional students, and management, oral cavity and other professional students are concerned about less scientific research less. (As shown in Fig. 1)

![Figure 1. Distribution conditions of survey object.](image-url)
Scientific awareness of survey object: 90% of the students under investigation thought that participation in scientific research is necessary and contribute to their own development. 43% of the students said they would like to participate in their own professional research, 27% of the students said they would like to participate in their own interested research activities. Most of the students thought the reason why participate in scientific research is mainly due to professional requirements, can increase the professional knowledge reserves, can exercise thinking and practical ability, it is conducive to take part in the postgraduate entrance exams and employment, only a small part thought that it is based on the publication of papers and social development needs.

The preparation and obstacles of scientific research for respondents: students in order to participate in scientific research and has actively concerned about and understood it. Most of the students actively participate in research-related lectures report, and take the initiative to consult teachers and classmates; only a small number of students won the relevant research competitions and topics and participated in the relevant practical activities. Most of the students before scientific research worried about their knowledge reserves and lack hands-on ability, they do not know how to contact the relevant research teachers, and cannot find the direction of scientific research. At the same time, many students also feel that the way through the scientific research will not be enough time and energy, without professional teacher guidance, lack scientific research base and facilities and practical training opportunities are hampered.

Expectations of participating in scientific research for respondents: the vast majority of students hope that scientific research help their own studies, can enhance professional ability and expand extracurricular knowledge, meanwhile help postgraduate exam and employment, only a small number of students expect to assess and award points through scientific research. The most students who want to participate in scientific research expect to improve their hands-on practice and thinking innovation ability through scientific research, as well as enhancing their writing and data processing abilities.

School scientific research atmosphere and propaganda way: the survey shows that most students feel that the surrounding atmosphere is that a lot of teachers and students are involved in scientific research, but the whole propaganda and practice activities of school is very small. 87.9% of the students who want to participate in the scientific research are recommended by the professional teacher. Students who want to participate in scientific research students, 76.5% is through their own access to the literature and understand, there are a small part of the students through the introduction of the classmates and friends, and the students who participate in scientific research through the propaganda and encouragement of school and related community activities is relatively small.
ANALYSIS OF SURVEY RESULTS

For the distribution of respondents, they are mainly medical undergraduates with low and middle grade, and most are interested in scientific research, it is more in line with the original intention of this survey, this survey in order to investigate students’ confusion that low school grades want to participate in scientific research but do not know how to better participate in scientific research, and specifically explore and propose the relevant advice and suggestions.

For the respondents’ views and expectations of scientific research, more students said that participation in scientific research is necessary and very interested in scientific research, they want to improve their studies through scientific research, hope that scientific research help their own specialty, and improve their own all aspects of the ability through research, it is conducive to employment and postgraduate exam. It shows that the purpose of this survey is clearer; which help us further explore the issue of respondents later.

For the respondents’ fusion and problem on scientific research, most of the students that want to participate in scientific research make efforts and try, but because of some factors, such as fear of their own inadequate ability, without teacher guidance, propaganda and encouragement of school is too little, lack scientific research base and training opportunities and stalled in the scientific research door. It shows that respondents are full of hope and motivation for scientific research, but because of many subjective and objective factors and cause they cannot participate in the position of scientific research.

The above survey results are analyzed and discussed, the statistics obtained are in good agreement with the purpose of this survey, the collected questions of the respondents are very clear, so that the significance of the investigation can be further manifested and provide direction and reference for solution and exploration the problem further.

DISCUSSIONS AND SUGGESTIONS

First, based on the student body: the students who are interested in scientific research, the first need to understand what is scientific research? Why participate in research? What kind of attitude should be used to treat research? In short, scientific research is to use scientific methods to study our world, try to find new laws and create new things. Since ancient times, people have been curious about this unknown world, and modern scientific research is to obtain amazing achievements, so our
current scientific research is almost based on the work of predecessors and flourish without exception. It is based on this, we must first learn professional courses, master some basic concepts, methods and skills of this field. On this basis, we also need to understand the existing research results of a research field, look up a large number of reference, search various information, through their own thinking and operation, experience and deepen the basic knowledge of the specialty, and maximally take the subjectivity and initiative, thus achieving from passive learning to active learning, and changes from completed learning to innovative learning [2].

(1) Professional needs: demands for scientific research of different specialty are not the same, compared to biology, pharmacy and other specialty, pay more attention to training students’ scientific research ability, scientific research will be more biased in the curriculum and internship arrangements, and clinic, image, oral cavity and other medical specialties focus on the clinical operation of students in the future, less scientific research requirements, but this does not mean that people are not encouraged to participate in scientific research, properly participate in basic scientific research in the undergraduate stage, learn scientific research ideas and innovative thinking is quite useful for students in the future. Therefore, based on professional development, students who want to participate in scientific research can consider the direction of professional development and future employment trends, contact with related experimental skills learning of their own professional in advance; improve the reserves of professional knowledge, meanwhile train their own scientific and technological innovation ability.

(2) Mentor and research direction: students of most majors choose mentors and scientific research direction is mainly through the guidance and suggestion of teachers, such as clinic, biology, pharmacy and other specialties, they will arrange the teacher with relevant research experience to teach, guide and encourage everyone to participate in scientific research, so students can contact the teacher to ask for guidance; some other specialties such as care, public management in the lower grades lack teachers with scientific research experience, students can through more relevant research sites, school publicity channels and friends around to understand the scientific research. The research project of some tutors are not completely fixed, but the main direction is determined, the students can use the literature, concern about the scientific research to choose their own interested topics, these teachers guide the experimental method and predict the experimental results; another part of the mentor has a fixed subject direction subject, if interested in the direction of the tutor's research, can read the tutors’ published reference, familiar with the mentor's subject, after learning for some time, understand scientific research deeply. Through the mentor and students’ two-way choice, both achieve the teacher's research project on the needs of the staff, but also reflect the students’ scientific research autonomy.

(3) Time and energy distribution: participation in scientific research need to pay a lot of time and effort, need to unremitting exploration in order to obtain excellent results. Most of the general undergraduate medical institutions are five years term, and medical students’ tasks are more heavy, learning pressure is relatively large, so the distribution of time and energy has become a major obstacle to participate in scientific research, which requires students should learn to strictly ask themselves, learn to arrange a reasonable time, distribute time investment of learning and research well, balance and manage their own lives. It is recommended to complete the usual course tasks, learn theoretical knowledge, and then use spare time to do scientific research.
and supplement, change the theory into practice. It is best to use the holidays for systematic research and study, the effect is better, it both solves the problem of lacking time of scientific research activities, but also enrich the holiday life [3].

(4) College internship distribution: undergraduate medical institutions generally set affiliated hospitals, and students’ internship arrangements will be arranged to different hospitals based on different institutions and specialties, those low and middle grade students who want to participate in scientific research, they can prepare based on the distribution selectivity of late practice base in advance, contact the relevant hospital or teachers who are responsible for the allocation of scientific research, participate in scientific research in advance, but also lay a good foundation for the latter practice. If conditions permit, students can participate in scientific research during the internship, continue to apply project and further explore in internship, progress will be better.

Second, pay attention to school construction: grasp the golden age that undergraduate medical students participate in scientific research projects, do propaganda and guidance, train medical undergraduate students to participate in scientific research activities, improve the management system of scientific research can effectively promote undergraduate students to participate in scientific research projects, Enhance the ability of undergraduates to participate in scientific research, but also accelerate the exploration process of school scientific research.

(1) Improve the target and prevalence of propaganda work: the survey results show that students with different grades and specialties have different attention and awareness for scientific research, which may be relative to different students’ professional knowledge, academic stress and spare time. Different departments have different training goals for students, the degree of emphasis on undergraduate scientific research projects are not the same, the propaganda that students get from the scientific research knowledge is not the same [4], the low-grade students can more combine with teaching, basic knowledge of scientific research and related information are introduced into the classroom, guide students to establish scientific research awareness, stimulate scientific research interests, encourage and support relevant organizations to carry out propaganda activities of scientific research, provide platform and propaganda channels. Regularly develop academic exchange lectures of scientific research, through the school, hospital propaganda and promotion, call for teachers and students to concern about the development trend of scientific research.

(2) Establish a flexible incentive mechanism; increase the participation motivation of teachers: the survey shows that one of the difficulties of many students participate in scientific research is the lack of teacher guidance, college students’ research projects cannot be separated from the teacher's participation. Schools can build a flexible incentive mechanism to increase the participation motivation of teachers. Encouragement is an important means of scientific research management, which can effectively mobilize the enthusiasm of scientific research personnel, it is conducive to improve the quality of scientific research personnel, and promote continued innovation and development of college scientific research. To establish and perfect an incentive mechanism must strengthen the core role of people, increase investment in scientific research, strengthen the mechanism construction of competitive incentive, and build a fair assessment system [5]. The design of the incentive mechanism should also consider all aspects of the factors, pay attention to the combination of incentives and punishment, the combination of material incentives and spiritual incentives, a variety
of measures are reasonably arranged [4], reasonable incentive system will greatly promote the development of college scientific research.

(3) Increase capital investment and expand the scientific research project: much information show that participation in scientific research project are object orientation and behavior orientation to study the relevant knowledge of scientific research, students who participate in the college research project will more actively pay attention to development trends and information of scientific research project, and will learn about related knowledge of scientific research steadfastly. Scientific research activities can not only be carried out in the laboratory, but also in a variety of forms, such as reference reading, writing review, social research in winter and summer vacation, all levels of challenge cup competition [6]. So the school needs to further increase the funding of scientific research, expand the number of scientific research projects, and expand the coverage of students [4], meanwhile better develop school scientific research brand. In addition, we should guide, encourage and support department that conditions allowed to set up hospital-level scientific research projects, to cultivate professional research personnel as the starting point, so that more and more students have the opportunity to participate in scientific research projects, and get exercise and development.

(4) Improve the management system of scientific research, and create exchange atmosphere of scientific research: improve the management system of scientific research in colleges, whether from the subject set, assessment, personnel training, or scientific research base construction; it requires colleges and universities to have broader vision. In order to form a strong atmosphere of education and scientific research, we must achieve the popularization of education and scientific research, namely, education and scientific research must be popular among the teachers, from "everywhere have scientific research, everyone do scientific research" situation. Therefore, to create a strong atmosphere of education and scientific research should be to achieve the education and scientific research as the center, the following seven aspects of the work should be done well: enhance the concept of education and scientific research, propagate and promote the backbone of scientific research, improve the popularity of education and scientific research, improve education and scientific research system, many times develop scientific research activities, construct scientific research hardware, establish scientific research network and extensively communicate with outside scientific exchanges. For example, face the world-class universities and first-class subjects, professional settings are made and the corresponding dynamic adjustment mechanism is established, meanwhile optimizing the national laboratories, key laboratories, engineering laboratories and so on, the classification and integration are made in accordance with functional positioning, build open and interactive innovation network, so that research base formed by public investment can more widely serve the economy and society. Pay attention to the condition construction of university students research projects, promote the experiment and teaching demonstration center, all kinds of open laboratory and other innovative resources fully open to the undergraduate students, take the initiative to provide students with free experimental sites and experimental equipment [7]. Vigorously carry out such as "college students innovation and entrepreneurship", "Challenge Cup" and other amateur activities scientific research, provide students with opportunity to exchange experience, show results and share resources, create a relaxed education and entrepreneurship environment that is conducive to the full development
of students personality [8]. For the institutions with strong atmosphere of scientific research, we can increase the training intensity of scientific research; do professional guidance, meanwhile strengthen communication with the faculties that atmosphere of scientific research is relatively insufficient, establish scientific research system with mutual aid of scientific research and mutual complementarity of specialties, and provide students with a platform for exchange and study of scientific research.

ACKNOWLEDGEMENTS

Basic Medical College of Hubei University of Medicine, Life Sciences Institute of Affiliated Taihe Hospital of Hubei University of Medicine, Reproductive Medicine of Research Center of Affiliated People's Hospital of Hubei University of Medicine, Affiliated Dongfeng Hospital Research Institute of Hubei University of Medicine, Bio-X Research Center of Hubei University of Medicine, Student's Platform for Innovation and Entrepreneurship Training Program.

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