



Comparison of Research Self-efficacy of Graduate Students and the Effectiveness of their Supervisors in Kermanshah University of Medical Sciences

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Abstract

Background: Quantitative and qualitative improvement of graduate student projects requires recognizing the problems of the target group perspective.

Objectives: This study aimed to evaluate the research self-efficacy of students and the effectiveness of their research professors.

Methods: This cross-sectional analytical study was conducted on all graduate students of basic sciences at the medical school by convenience method (116 people) in 2019 who were in dissertation compiling process with their supervisors. Two separate questionnaires were designed for professors and students. The data were analyzed by descriptive statistics using SPSS Software Version 16 and their relationship were examined by the Pearson correlation coefficient.

Results: According to the data collected from 116 students, 65.5% were female, 69% were single, 91.4% were master's, and 8.6% were doctoral. The self-efficacy was divided into 7 areas, which was assessed based on the students' point of view. The highest score was in ethics (3.77 ± 0.9), and the lowest score was in qualitative research and statistical methods (3.01 ± 0.8). Regarding the evaluation of professors from students, self-efficacy in ethics (4.67 ± 0.66) and implementation method had the highest scores, and self-efficacy in statistics and analysis had the lowest score (3.25 ± 1.18). Pearson correlation measurements indicated that the score of the students' research method had a significant relationship with areas, including conceptualization, report writing, and translation of English texts ($P < 0.05$).

Conclusions: Getting a good grade from students, especially high score in ethics, shows the effectiveness of the activities and the weakness in qualitative research and statistical analysis.

Keywords: Research Self-efficacy, Graduate Students, Medical School, Kermanshah

1. Background

In today's world, all countries are trying to consider the role of universities in national development to promote knowledge and technology. This role is pursued in two directions of education of specialized human resources and develop the knowledge and technology. A particular point of interest is how to implement research-based education with different perceptions because reducing the gap between education and research occurs with the entry of research into the body of higher education (1). Researching is one of the essential processes and skills for students, especially in graduate courses (2) because these students have to research in their course to pass academic units.

Graduate students make up about 55% of all researchers in the country (3). Therefore, they have an essential role in improving educational processes and expanding scientific services. Students' attitude to research is an essential factor for their willingness to their field of research. However, the critical point is that research needs training because research is a technique with different methods, which is not taught during the education path (4).

Professors always seek to train students to research for leading their research (5). In addition, the optimal interaction between the supervisor and student is the key to success in academic research, such as a dissertation. Since this interaction should be considered by the educational groups at high standards to develop expectations as an op-

portunity for learning and crucial consequences (6, 7). Research is one of the most critical tasks of universities, and graduate students are responsible for some research tasks by completing a dissertation. One of the factors affecting the quality of research is students' research self-efficacy, in which the three axes of education, learning, and research are aligned (5). Research self-efficacy is one of the factors affecting the research process, which is directly related to students' research performance (6) and requires skills (8). Anxiety and uncertainty about the ability to conduct research and low research self-efficacy can interfere with students' learning, teaching, willingness to do research and more scientific participation (9).

The concept of self-efficacy was first introduced by Kurbanoglu et al. in social psychology as the main factor in social learning theory (10), and then created in all areas (11). Self-efficacy was explained as one of the most critical factors affecting other positive variables with a vital role in most educational and research activities. Identifying the factors affecting self-efficacy and its promoting variables is very important (12). Accordingly, self-efficacy is influenced by several factors as a motivational factor in the educational system. According to studies, self-efficacy is a proper predictor of graduate students' research behavior (12). Based on Hemmings and Kay view, self-efficacy is important in estimating personal abilities to perform research tasks (13), which implies students' confidence in their abilities and perceptions of their research skills (14). One of the primary tasks to be qualified in research work is to identify the characteristics of a researcher to select the right people (15). Therefore, identifying the factors affecting students' research performance can be crucial and instructive. Promotion in the university increases performance in various fields of study and detailed research (9) because paying attention to students' self-efficacy in research is essential to grow further (16). Studies have shown that high research self-efficacy is an essential factor in successful research implementation in graduate students and tendency to repeat (9). Therefore, it is necessary to know the status of students' research self-efficacy and supervisors' effectiveness in their research.

2. Objectives

Many studies have been conducted on students' research self-efficacy to examine their relationship with personal and organizational factors. However, this study aimed to compare the research self-efficacy of graduate students and effectiveness of supervisors in their research at Kermanshah University of Medical Sciences, Iran, in the academic year 2018 - 19.

3. Methods

This cross-sectional analytical study was conducted in Kermanshah University of Medical Sciences, Iran in the second semester of 2018 - 19. The study population included all masters students (115 people) and PhD students (11 people) in basic medical sciences who were compiling the dissertation and all professors who were in charge of their dissertations as supervisors. The whole Sampling was done by convenience method and the whole study population was studied as a sample. Two separate questionnaires were designed for professors and students. The first part of the questionnaires included demographic information, and the second part was related to the students' research self-efficacy. The questionnaires consisted of 57 items, including seven subscales of statistical and analytical (13 items), conceptualization (12 items), method and implementation (11 items), qualitative research (5 items), report writing (7 items), skills and proficiency in searching and translating English texts (5 items), and self-efficacy in ethics (4 items) (11). This questionnaire was validated by Kazemi-Vardanjani et al. at Shahrekord University of Medical Sciences on the components and principles of research self-efficacy considering psychological criteria (17).

The reliability of each subscale was 0.92 (statistical and analytical), 0.91 (conceptualization), 0.90 (implementation method), 0.92 (qualitative research), 0.88 (report writing), 0.76 (search and translation skills of English texts), and 0 (ethics), and the total reliability was as much as 0.84 (11, 17).

The scoring scale uses a five-point Likert scale, including very low (1), low (2), medium (3), high (4), and very high (5). The Score 57 is considered as very low, 58 to 114 low, 115 to 171 medium, 172 to 218 high and 219 to 285 very high. In addition, the questionnaire validity was confirmed by the opinion of several professors. The questionnaire was distributed among several students and to confirm reliability the Cronbach's alpha was used, which was 0.86, 0.89, 0.83, 0.87, 0.81, 0.86, 0.81, 0.69, respectively. The coefficients showed satisfactory reliability for the questionnaire.

The second questionnaire for supervisors consists of two parts. The first part evaluated the student's research efficiency in seven subscales. The second part examined the effective factors in students' research efficiency (quality of learning processes, self-directed learning in research affairs, and the interest level in conducting research projects). It was also confirmed by experts in this 131 field and their reliability was estimated to be 0.91 using Cronbach's alpha coefficient. The Pearson coefficient was used to determine the correlation after completing the questionnaires and setting up the data analysis checklist using SPSS-16 software and analytical statistical tests and consid-

ering that the data had a quantitatively normal distribution, t-test was conducted to compare two groups and Pearson's coefficient was used to determine the correlation and to compare the average of the two societies. The method was used, which was measured in 7 components and there was a significant difference between the two groups of professors and students in the rest of the components except for the analytical and statistical component. This study has been approved by the University Ethics Committee with the code IR.KUMS.REC.1397.478.

4. Results

A total of 116 students were included, of whom 91.4% (106) were masters and 8.6% (10) were PhDs. The minimum and maximum age was 22 and 47 years, among whom 65.5% were female (35.5% male) and 69% were single (31% married). The minimum and maximum grade point average was 15 and 19, respectively, and the mean score of the research method course was 16.93. Generally, 52.6% of the previous field and 57.8% of the previous university were non-medical sciences. In addition, 70.7% were not a member of the Student Research Committee and Research Centers, 68.1% had no history of publishing articles in domestic and foreign journals, and 74.1% had no history of conducting research projects as an executor. From their point of view, the essential characteristic of research projects could be presented in conferences and seminars (92.3%) and published in scientific journals (80.3%).

Regarding the evaluation of self-efficacy from the perspective of students in 7 areas, the highest score was in ethics (3.77 ± 0.9) and English text search and translation skills (3.71 ± 0.81) and the lowest scores were in qualitative research (3.01 ± 0.82) and analysis of statistical methods (3.25 ± 0.70). The total score in all areas was obtained as much as 198. Regarding the evaluation of professors by students in the same seven areas, self-efficacy in ethics (4.67 ± 0.66) and implementation method (4.03 ± 1.01) owed the highest scores and self-efficacy in statistics and analysis (3.25 ± 1.18) gained the lowest score. The total score of professors in all fields to students was as much as 216. The obtained scores by students (198) and professors (216) were in the range of good grades, and the evaluation of professors by students in the areas of efficiency received a higher score than the students themselves (Table 1).

The Pearson correlation coefficient was used to measure the correlation between these factors due to their normal distribution and smallness based on the Kolmogorov-Smirnov test. Moreover, only the students' research method score had a significant correlation with some areas (conceptualization, reporting, and translation of English texts $P < 0.05$ ($r = 0.2$). There was no significant corre-

lation in 7 areas. The professors' evaluation of the effective factors in research efficiency was qualitatively determined by the quality of learning experiences of research processes, appropriate research behavior, being task-oriented in research, and trying to expand skills in research work.

5. Discussion

In the present study, the highest scores of students were in ethics and skills of searching and translating English texts, and the lowest scores were in qualitative research and analysis of statistical methods. According to professors, self-efficacy in ethics and implementation methods had the highest scores and the lowest score, respectively. Furthermore, the obtained scores by students (198) and professors (216) were in the range of good grades. The most important feature of research projects from the students' point of view was the ability to present at conferences and seminars and publish in scientific journals. The priority and scientific value of the project and its usefulness to society were less critical from their point of view. There was no significant correlation among age, gender, marital status, field, and previous university and students' grade point average, and only the score of students' research methods in some areas (conceptualization, reporting, and translation of English texts) were significant. There was no significant correlation between the evaluation of professors and students in 7 areas. The evaluation of professors was qualitatively great in terms of the quality of learning experiences in research processes, appropriate research behavior, being task-oriented in research, and trying to develop skills in research work.

Kazemnejad Matak et al. conducted a study on 303 medical students of the Islamic Azad University of Qom and found a direct and significant correlation between GPA and research self-efficacy. This study also showed a significant difference in research self-efficacy in terms of degree and course, passing a course or workshop on research methods, history of implementation or collaboration of research projects, and submission of articles to journals and conferences, which was against our study. This result could be due to the difference in students' grades. However, there was no significant difference in comparing the mean score of research self-efficacy with gender and marriage, similar to our results (18).

The study of Mardani et al. on 361 graduate students of Islamic Azad University of Sari in 2015-16 showed that the research experience among students was higher than average level and satisfactory in most of its dimensions, which is similar to our results. The scores obtained in the areas of self-efficacy were at the level of good scores (19).

Table 1. Mean Score of Graduate Students' Research Self-efficacy Scales from Their Perspective

Subscales	Mean \pm SD from Scale (1-5)		P-Value
	Students	Professors	
Analytical and statistical	3.25 \pm 0.7	3.25 \pm 1.18	1
Conceptualization	3.57 \pm 0.72	3.69 \pm 0.99	0.04
Method and implementation	3.36 \pm 0.69	4.03 \pm 1.01	0.001
Qualitative research	3.01 \pm 0.82	3.62 \pm 1.23	0.001
Reporting	3.46 \pm 0.77	3.68 \pm 0.98	0.03
Skills and proficiency in searching and translating English texts	3.71 \pm 0.81	3.88 \pm 1.07	0.03
Ethics	3.77 \pm 0.90	4.67 \pm 0.66	0.001
Total	3.44 \pm 0.77	3.73 \pm 1.01	0.004

Kazemi-Vardanjani performed a research on 112 postgraduate students of Shahrekord University of Medical Sciences and revealed that the total score of self-efficacy and its components are in the middle range, contrary to our results that the total score was good, but the lowest score in self-efficacy of qualitative research was similar to ours (17).

Kareshki and Bahmanabadi studied 288 graduate students at Razi University and showed that the variable of "conceptualization" is a good predictor of emotional-cognitive readiness of students in research creativity. In our findings, conceptualization had a significant correlation with the course score of the research method (16). Davari et al. investigated 80 final year general and specialized students of Yazd Dental School and showed a positive and significant relationship between the research self-efficacy scale and research performance. In this study, there was no significant difference among the mean of all self-efficacy areas regarding the age of the subjects except for skills and competencies, but the mean score of research performance in terms of age was significantly different. In addition, there was no significant difference between the mean total score and the score of the seven areas of research self-efficacy and performance with the gender, which was similar to the results of our study (20).

Garavand et al. conducted a study among 185 students of Mashhad University of Medical Sciences and showed a positive and significant relationship between research self-efficacy and all its components except students' research performance, which is similar to our findings (6). The study of Salehi and Ahanchian on 126 PhD students of Ferdowsi University and Mashhad University of Medical Sciences showed that environmental factors such as research experiences could affect students' research self-efficacy, which is a critical value for developing skills in research work (11). Abdullah and Evans showed that students' experience in developing research skills and project goals

was above average, which somehow agrees with the results of our study that the overall score of students was at a reasonable level (21). Lev et al. found a positive and significant relationship between students' self-efficacy and professors' judgment of their performance, contrary to our findings based on no correlation between students' self-assessment and professors' evaluation (14).

Rezaeian et al. examined 68 medical internship students of Rafsanjan University of Medical Sciences and showed a relatively poor level of research self-efficacy in this group of students, which is contrary to our findings. The main difference can be considered in the students' level in interpreting this difference. Moreover, the relationship between research self-efficacy with gender, interest in medicine, participation in research workshops, and research activities was significant, which was not significant with marital status, semester, father's literacy rate, mother's literacy rate, and participation in the student research committee. These results were similar to those of ours (22). In the study of Daryazadeh and Kuhpayehzadeh on 140 postgraduate and doctoral students of Tehran University of Medical Sciences, there was no significant difference between postgraduate and doctoral students on the ethics scale. Our findings also showed that self-efficacy in ethics is essential from the perspective of students and professors (23). Ramin and Aghazadeh showed that the self-efficacy of practical research skills, writing skills, research design skills was high among 106 graduate students of the Faculty of Psychology and Educational Sciences of the Kharazmi University of Tehran, which was in line with our findings (15).

Kareshki and Bahmanabadi evaluated 300 graduate students of Ferdowsi University of Mashhad and showed that students are highly capable in some skills, such as the overall score of research self-efficacy, basic research tasks, and the ability to collaborate in research with aver-

age skills and analyze and present research results. The research was similar to our results, but the analysis and statistics were contrary to our findings (16). Ramazani et al. studied 300 students and showed that the essential characteristics of desirable research projects and scientific value, usefulness to society, and presentability in conferences and seminars were the priorities. However, the priority and scientific value of the project and being helpful to society from the students' point of view were less critical in the findings of the present study, which shows the effects of the new space on research compared to previous years (24). Zhang et al. examined the research self-efficacy of 132 undergraduate nursing students in China and found the self-efficacy ability of the majority of students at a moderate level, which was contrary to our results, probably due to differences in students' education (25).

5.1. Conclusions

Achieving good grades by students and professors shows the effectiveness of educational measures in research at Kermanshah University of Medical Sciences. The importance of paying attention to ethics for students and professors is also a positive point. However, ethics should be applied in qualitative research and statistical methods by planning and holding the required workshops promoted this weakness.

Footnotes

Authors' Contribution: Elham Niromand: English study design and drafting, Seydeh Sana Hosseini and Seydeh Sara Hosseini: Gathering information and entering information into the application. Mohammad Rasool Khazaei: Supervision of all stages of analysis and writing the article.

Conflict of Interests: This study has not conflict of interests with a group or individual and all the information is coded and confidential. In the team of writers, Dr. Elham Niromand is Dr. Mohammad Rasool Khazaei's wife and the two Hosseini are also sisters.

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all consequences of possible withdrawal or future retraction will be with the corresponding author.

Ethical Approval: This study has been approved by the University Ethics Committee (code: IR.KUMS.REC.1397.478). Link: ethics.research.ac.ir/EthicsProposalView.php?id=23986

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