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Research self-efficacy and its relationship with academic performance in postgraduate students of Tehran University of Medical Sciences in 2016

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Abstract:

BACKGROUND: Research self-efficacy is one of the main factors influencing the successful conduction of research and following it in students. This study was performed with the aim of determining the research self-efficacy and its relationship with academic performance in postgraduate students of Tehran University of Medical Sciences (TUMS) in 2016.

MATERIALS AND METHODS: This cross-sectional study was performed on 320 postgraduate students of TUMS in 2016. Proportional stratified sampling was done with simple random sampling from each school. The data were gathered with Phillips and Russell's research self-efficacy questionnaire, demographic questions, and grade point average (GPA) and were analyzed with independent *t*-tests, ANOVA, Pearson's correlation, and multiple linear regressions in SPSS 18.

RESULTS: Out of 320 students participating in this study, 152 patients (47.5%) were male and 168 (52.5%) were female with the mean age of 27.83 ± 4.3 years. The mean of research self-efficacy score was 186.18 ± 59.5 which was significant depended on college degrees and was significantly higher in doctorate students ($P = 0.0001$). However, no significant difference was seen in research self-efficacy score of students due to gender ($P = 0.754$) and school ($P = 0.364$). There was a significant direct relationship between students' GPA and research self-efficacy score ($r = 0.393$, $P = 0.0001$).

CONCLUSIONS: Results of this study showed that the research self-efficacy score of TUMS postgraduate students is at an acceptable level, except the quantitative and computer skills that need appropriate educational interventions. As a direct and significant relationship existed between research self-efficacy score and student's academic performance, improving the research self-efficacy will also increase students' academic performance.

Keywords:

Academic performance, research, research self-efficacy, students

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Introduction

Research, learning, and teaching of it are from the needs of each community and are the essential processes and skills for students, especially in postgraduate grades, and have a great role in spreading scientific services and society improvement, that the removal of related obstacles are of the concerns of teachers, university authorities, and relevant policymakers.[1-4]

Many researchers have tried to identify barriers and factors affecting research and increasing research production at universities.[5-7] One of the main barriers

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for many postgraduate students is anxiety and doubts in research abilities and low research self-efficacy that can interfere with learning, teaching, and tendency to perform research.[8-10]

The self-efficacy was defined by Bandura as belief in your ability in performing tasks successfully, and he has mentioned the self-efficacy as a sense of competence, efficiency, and the ability to cope with life.[11,12] People with higher self-efficacy show more effort and insist in performing tasks than those with low self-efficacy. Hence, their performance in doing tasks is also better.[2,9,12]

Considering the fact that self-efficacy beliefs have been examined in different scientific fields and researches have shown that self-efficacy beliefs are effective in most scientific fields, researchers have focused on the impact of these beliefs on research and this has caused a new concept entitled research self-efficacy.[3,13]

Lev *et al*. have named the confidence of students in their ability and perception of their research skills, as research self-efficacy which plays a key role in predicting an individual's research.[14] Students who have low research self-efficacy are not sure about their ability to perform a research and do not believe that their attempt will lead to success and are often anxious, especially when they are evaluated they feel a lack of competence. Instead, the students who have higher self-efficacy believe in their competence have the ability to investigate and are more successful in research.[12,13,15]

Hence, assessment of research self-efficacy and identifying affecting factors will be important as one of the main factors influencing the successful completion of research and following it in postgraduate students. However, only a few studies have been done about this issue in Iran.[6,16-18]

The academic performance of students is one of the most important indicators in the evaluation of postgraduate education that studying associated factors has been more considered by education experts during the past three decades so that academic planners be able to plan appropriate interventions to improve the university performance.[10,19] There are different definitions of academic performance which are mainly located in two areas including objective and subjective. To assess academic performance in studies, grade point average (GPA) has been considered as a criterion for academic performance.[10,20] Since in postgraduate courses, teaching and research are combined together, and part of the training score of the person is related to his research work, research self-efficacy can be associated with the academic performance of these students.[10]

Since assessment of research self-efficacy is the best way to evaluate the effectiveness of training programs and identifying weaknesses and problems related to the research of postgraduate students[7,16,21] and due to the lack of similar research at Tehran University of Medical Sciences (TUMS), this study was performed with the aim of determining the research self-efficacy and its relationship with academic performance in postgraduate students of TUMS.

Materials and Methods

This cross-sectional study was performed on 320 master and Ph.D. students of TUMS in 2016. The sample size was calculated 320 persons by the formula for the correlation between two variables and based on Ghadampour *et al*. results[10] and the correlation coefficient of $r = 0.16$. By considering different schools, the proportional stratified sampling was done, and the required sample was prepared randomly and independently at each school from the list of students. Before data collection, the objectives of the study were explained to the students and also the assurance was given that all information will remain confidential for the researchers.

This study has been confirmed by the Ethics Committee of TUMS with the code of IR.TUMS.REC.1394.1824. Data were collected by Phillips and Russell's research self-efficacy questionnaire with demographic information and GPA as an indicator of academic performance. Demographic questions were included questions about age, gender, college degrees (M.Sc. and Ph.D.), and the school of students. The questionnaire used for research self-efficacy was Phillips and Russell's (1994) questionnaire which its validity and reliability were confirmed in the study performed on the counseling psychology postgraduate students in the United States.[22] Roshanian-ramin and Aqazadeh[2] translated this questionnaire from English to Persian in 2012 and used it after confirming its validity and reliability. This scale has 33 questions and four subscales including (1) research design skills (eight questions), (2) practical research skills (eight questions), (3) quantitative and computer skills (eight questions), and (4) writing skills (nine questions). Scoring this scale is so that each question is given a score between zeros to nine that zero reflects the belief of inability and 9 represents the belief of performing in the full item ability and the range of possible obtaining scores by any person ranges from zero to 297. The reliability of this scale and its subscales include research design skills, practical research skills, quantitative and computer skills, and writing skills, respectively, by Cronbach's alpha 0.940, 0.776, 0.688, 0.813, and 0.891 and its validity has been confirmed at an acceptable level.[2,22] Finally, after gathering the data, they were transferred to SPSS (PASW Statistics for Windows,

Version 18.0, Chicago: SPSS Inc., USA), and in addition to representing descriptive statistics by statistical *t*-test, ANOVA, Pearson's correlation, and multiple linear regression, data were analyzed at $\alpha = 0/05$.

Results

From 320 students participating in the study, 152 (47.5%) were male and 168 (52.5%) were female and the mean age was 27.83 ± 4.3 years, with a minimum age of 21 and maximum of 45 years. Most of the students were from the school of public health (24.4%) and 225 cases (70.3%) of students were in master's degree and 95 patients (29.7%) at the doctorate level. The mean score of research self-efficacy was 186.18 ± 59.5 and GPA of students was 17.48 ± 1.1. The mean scores of students on research self-efficacy subscales' including quantitative and computer skills, practical research skills, research design skills, and writing skills, respectively, were 38.75, 48.35, 41.22, and 57.87.

Independent *t*-test showed that research self-efficacy score was significantly different in terms of college degrees and was significantly higher in Ph.D. students ($P = 0.0001$). However, no significant difference was observed in research self-efficacy score of students by gender ($P = 0.754$) [Table 1]. One-way ANOVA did not show significant differences in research self-efficacy score of students depended to school ($P = 0.364$) [Table 1].

Table 1: Comparison of research self-efficacy score by gender, college degrees, and school of students

Variable	Mean±SD	*P*
Gender		
Male	187.27±53.43	0.754[a]
Female	185.20±64.61	
College degrees		
M.Sc.	168.12±55.78	0.0001[a]
Ph.D.	228.95±44.30	
School		
Medicine	189.90±50.96	0.364[b]
Public health	192.42±55.77	
Rehabilitation	194.77±53.01	
Nursing and midwifery	166.46±78.49	
Nutritional sciences and dietetics	171.67±66.50	
Allied medical	187.61±70.25	
Advanced technologies in medicine	193.89±38.21	
Pharmacy	195.00±48.83	
Traditional medicine	180.80±29.44	

[a]Independent *t*-test, [b]One-way ANOVA, F=1.098. SD=Standard deviation

Based on the results of Pearson's correlation, a significant direct relationship existed between the research self-efficacy and its subscales' score and students' GPA. With the increase of research self-efficacy score, GPA also increased significantly ($P = 0.0001$) [Table 2]. In addition, a direct significant correlation existed between age of students and research self-efficacy score ($r = 0.250$, $P = 0.0001$) and research self-efficacy score significantly increased by aging.

Multiple linear regression was used to predict the score of research self-efficacy, using variables in this study, and after entering the variables by forwarding method, regression coefficients were significant for the variables of college degrees and GPA ($P = 0.0001$) and these two variables could explain 28.2% of research self-efficacy score variance ($R^2 = 0.282$) [Table 3].

Discussion

Assessment of research self-efficacy is the best way to evaluate the effectiveness of training programs and identifying weaknesses and problems related to research in postgraduate students. This study was conducted with the aim of determining the research self-efficacy and its relationship with academic performance in postgraduate students of TUMS in 2016.

The results showed that the mean score of research self-efficacy was 186.18 in postgraduate students of TUMS which was higher than research self-efficacy score in Roshanian-ramin and Aqazadeh study[2] performed on Master of Psychology and Educational Sciences students of Tehran Kharazmi University (179.74) and Aryani *et al*.[17] on the postgraduate nursing students of Ardabil university of medical sciences (184.76). Phillips and Russell in America reported the research self-efficacy score in counseling psychology postgraduate students as 190.[22]

In the present study, among the subscales of research self-efficacy (observing the proportion of the number of questions), the highest students' mean score was observed in terms of writing skills and the lowest in terms of quantitative and computer skills. Furthermore, in Roshanian-ramin and Aqazadeh, Aryani *et al*., and Phillips and Russell studies, the mean score in quantitative and computer skills which is more depended to statistical abilities of data analyzing, was

Table 2: The correlation between grade point average and research self-efficacy score and its subscales in students

Variable	Research self-efficacy score	Score of research design skills	Score of practical research skills	Score of quantitative and computer skills	Score of writing skills
Correlation with GPA (*r*)	0.393	0.291	0.350	0.387	0.401
P	0.0001	0.0001	0.0001	0.0001	0.0001

GPA=Grade point average

Table 3: Multiple linear regression to estimate the research self-efficacy score in terms of college degrees and grade point average in students

Variable	Regression coefficient (*B*)	*t*	*P*	Model
Constant (*a*)	−122.097	−2.765	0.006	Dependent variable: Research self-efficacy score
College degrees	49.317	7.523	0.0001	R^2=0.282
GPA	13.974	5.293	0.0001	*F*=62.366
				P=0.0001

PA=Grade point average

lower compared to other subscales.[2,17,22] It can be said that research self-efficacy is acceptable in postgraduate students of TUMS, but according to scores of subscales and questions of questionnaires, the statistical content such as sampling and determining sample size, data analysis by statistical software, qualitative studies, and designing a valid and reliable instrument requires more and better training. Participating in motivating workshops to work along with theoretical education content can improve the ability of students to the listed items. Bakken *et al*.[23] and Black *et al*.[16] in their studies with the aim of promoting research self-efficacy on American doctors have claimed that educational interventions and short-term workshops are helpful.

In the current study, a significant positive correlation was seen between the student's GPA as their academic performance with research self-efficacy score and its subscales, and by increasing GPA, the research self-efficacy score in different subscales also increased. In Ghadampour *et al*. study in postgraduate students of Mashhad University of Medical Sciences, also a positive correlation was seen between the GPA of students and the research self-efficacy score, but this relation was not significant.[10] Ghanbari and Soltanzadeh in their study on postgraduate students of Hamadan University of Medical Sciences saw a significant positive relation between the research self-efficacy and student's educational progress.[24]

In Taraban and Logue study on American students, it was shown that students with higher GPA benefit their research experiences more than others.[25] Hence, a significant amount of curriculum in postgraduate grades is related to research activities and a part of learning score is related to how to perform research tasks, we can say that the students' more confidence in their research abilities and their higher research self-efficacy, leads to their better performance in research tasks, and results in receiving higher scores and better academic performance.

This study result did not shows any significant difference in research self-efficacy score according to gender that this was similar to the results of Garavand *et al*.[6] study on Mashhad University of Medical Sciences students, Ashrafi-Rizi *et al*. study[18] on Isfahan University of Medical Sciences students, and Phillips and Russell[22] and Bierer *et al*. study[15] on American students. The research self-efficacy score in Odaci[26] study on postgraduate students of Karadeniz University of Turkey was more in females, and in Park *et al*.[27] study on Korean students was more in males. The similar learning and research environment for both males and females in TUMS can be the cause of similarity in their research self-efficacy score.

The current study showed that the research self-efficacy score in Ph.D. students was significantly higher than master students. Rezaei and Zamani-Miandashti study[28] on agriculture students of Shiraz, Ashrafi-Rizi *et al*. study in Isfahan University of Medical Sciences,[18] Phillips and Russell[22] on counseling psychology students of America, and Reyes[29] in Mexico also approved this issue. Ph.D. students have passed master degree and lessons such as statistics and epidemiology, seminar and thesis and have been exposed to more research concepts and experiences. Hence, due to Bandura theory about self-efficacy, more experience and opportunity for participation in research activities leads to increasing in Ph.D. students' self-confidence in research.[12]

Due to the findings of this study, a significant positive relation was seen between age and research self-efficacy of the students and by aging, the research self-efficacy score also increased. Furthermore, in Rezaei and Zamani-Miandashti study[28] on postgraduate agriculture students of Shiraz, a significant positive correlation was seen between age and research self-efficacy. However, in Lambie and Vaccaro study[30] in America, this correlation was not meaningful. It seems that students with higher ages, due to more experience and opportunities for learning and doing research activities, have more self-confidence in doing research.

In this study, no significant difference was seen in research self-efficacy score of students of different schools. In Ashrafi-Rizi *et al*. study,[18] in Isfahan University of Medical Sciences, also there was no significant difference in research self-efficacy due to school. However, Odaci[26] reported research self-efficacy significantly higher in students of science school compared to the School of Social Sciences and Health. This similarity could be justified according to the same

lesson plan and resources of research methodology in medical sciences schools.

Among the most important limitations of this study, we can mention self-report data, especially GPA in students. It is recommended to perform similar studies to investigate the research self-efficacy and related factors in other medical sciences universities.

Conclusions

In general, the findings of this study showed that the research self-efficacy of the postgraduate students of TUMS is at an acceptable level, except quantitative and computer skills that need appropriate educational interventions. The research self-efficacy score in students did not have any significant difference according to gender and school but was significantly higher in Ph.D. students. According to this point that there was a direct significant correlation between the research self-efficacy score and the students' academic performance, the improvement of research self-efficacy will also result in students' academic performance improvement.

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Conflicts of interest

There are no conflicts of interest.

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