Research Paper

Investigating the Relationship Between the Thesis Score and Grade Point Average of Master of Science Graduates of Rehabilitation Faculty From 2008 to 2019

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ABSTRACT

Background and Objectives: Choosing a thesis subject is one of the critical concerns of master's students because a student's graduation depends on defending the thesis. The main research question was whether students with a lower grade point average (GPA) also require a lower score and spend more time and vice versa whether students with a higher GPA perform better for the thesis or not.

Methods: In this cross-sectional study, all master's graduates of the Faculty of Rehabilitation Sciences between 2008 and 2019 who had been recorded in a computer system were enrolled. Using the stratified sampling method, at least one sample was assigned to each stratum (field year), and the sample size was calculated to be 128 people. The data were analyzed by SPSS software, version 19 via correlation and regression analysis with a chi-square test.

Results: In this study, the correlation coefficient between the duration of the study and thesis score was significant and obtained as -0.289 (P=0.001), while the correlation coefficient between the duration of the study and the student's GPA was only significant (P=0.047) and equal to -0.176. The estimated Pearson correlation coefficient between the thesis score and GPA for all graduates was r=0.352 (r=0.338 for men and r=0.284 for women).

Conclusion: Although the GPA of female students was better, the statistical analysis indicated that the student gender was not an effective factor in getting a thesis score. Considering the constancy of academic courses across all groups, the correlation between the duration of the study and the thesis score was negative. It seems that most students spend more time at university due to the delay in defending the thesis.

Keywords: Thesis, Grade point average (GPA), Thesis score, Master of science (MSc.)

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> ↑ *What is "already known" in this topic:*
>
> *Passing the thesis as part of the medical education does not have a long history, and accordingly the conditions of conducting and scoring the thesis are not the same across different countries.*
>
> *In Iran, passing the thesis is mandatory for different fields at discontinuous Master's and PhD levels plus MD degree.*
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> → *What this article adds:*
>
> *Based on the results of this study, the correlation between the duration of study and thesis score was negative. Because of delay in defending the thesis, the duration of study of most students was beyond the legal deadline. There was also a weak correlation between GP and thesis score. Gender was not an effective factor for acquisition of thesis score.*

Introduction

One of the major concerns of master's students is to choose the subject of thesis because the student's graduation depends on defending it. After choosing the subject and being assigned the advisor and supervisor professors, the student's concerns over the score and method of thesis assessment diminish, and they mostly focus on publishing a paper. Most students believe that the range of variations in the thesis score will be a maximum of 2 (18-20) and they are not much concerned about its score. In particular, the supervisor and advisor professors are among the assessors and their scores are mostly predictable in advance. Regardless of the quality and quantity of theoretical credits, they believe in successfully defending their thesis, because the thesis score is not counted in the student's grade point average (GPA). Accordingly, the student mostly deals with the structure of the thesis rather than its methods and contents and does not see a considerable relationship between theoretical credits and the thesis.

The major stages of activities of master's students for graduation include choosing the subject, drafting a proposal, approval of a proposal, field and clinical operations, data extraction, data analysis, and interpretation, publishing a paper, and defending the thesis (reference, the educational code). In this process, supervisor and advisor professors have a prominent role. Even when the student does not find a suitable subject, typically the proposer of the subject is chosen as the supervisor. In this way, uniformity and consistency occur among the proposer and approver of the subject, authors of the thesis, and paper. Only external and internal reviewers or referees have a discontinuous and less prominent role in the stages of approving the proposal and defending the thesis.

The constant presence and notable attempts of the advisor and supervisor professors in the above stages may induce a sense of an already-prepared thesis. Typically, a bias occurs in the assessment and review of a thesis whose professors have contributed to its development, and they assign an excellent score to it. The score of advisor and supervisor professors has the same weight in this thesis assessment. A major part of the final score of the student is controlled by the composers. Thus, the independence of reviewers is compromised in the presence of advisor and supervisor professors, and their score given to the student thesis may be unreal.

Ahmadi proposed to create a system to target student theses to prevent the loss of student's time for choosing the subject and not conducting repeated research proposals [1]. In this way, all universities of the Ministry of Health and Higher Education communicate with each other, causing enhanced research levels of students.

Considering the constancy of the academic course and the financial burden of increasing the years on the educational system of the country, research should be conducted about the relationship between thesis scores and GPA to determine the time pattern of defending the thesis after completing the theoretical courses. The results obtained from this research can be applied in research studies on education; thereby the reasons for the prolongation of the time of defending the thesis will be discussed. Accordingly, this study was conducted to respond to this question: "Do weaker students with a lower GPA spend more time for the thesis and acquire a lower score, and

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vice versa do students with higher GPA spend less time for the thesis and achieve higher scores?"

Materials and Methods

In this cross-sectional study, student GPA, the field of study, date of admission and date of defense, gender, and status of tuition fee payment were considered the independent variables, while the thesis score was regarded as the dependent variable. The statistical population included master's graduates of the Faculty of Rehabilitation Sciences from 2008 to 2019. If the GPA or thesis score of the student is not registered in the computer system of the faculty, that student will not be included in the study.

Considering the lack of access to similar studies, no estimation was made on the relationship between thesis score and GPA. Accordingly, in a preliminary study of a 32-member sample, the Pearson correlation coefficient was estimated at 0.065. However, the researchers and experts in education guesstimated a correlation coefficient of 0.30-0.35 for these two scores. Thus, considering a test power of 80%, a confidence interval of 95%, and a correlation coefficient of 30%, the minimum required sample size was obtained at 113. The sampling was implemented via a stratified method (every field year as a stratum), whereby the number of samples was divided in proportion to the magnitude of each stratum. In this method, at least one sample, albeit small, should be allocated to each stratum [3]. Thus, the sample size increased to 128. Accordingly, the proportion between the number of sample subjects and the number of graduates in each field may not be completely established. The data were analyzed using SPSS software, version 19 via correlation and regression analysis with a chi-square test.

Results

This research included the theses of 128 students, 27 students in orthosis and prosthesis, 23 students in physiotherapy, 18 students in optometry, 15 students in speech therapy, 14 students in rehabilitation management, 12 students in occupational therapy, 11 students in audiology, and 8 students in sports physiotherapy. Out of this number, 76 students (59.4%) were women and 52 (40.6%) were men. The Mean±SD GPA was 17.92±0.92 out of 20, and the Mean±SD thesis score was 18.90±0.99 out of 20.

The largest number of thesis defenses was found in 2015-2018 (annually 18 people), while the minimum number was observed in 2011 (1 person). Possibly, the reason for the considerable decrease in the graduates in

this year is the integration of Iran University of Medical Sciences with Tehran University. A total of 44 defenses occurred in February and 35 defenses in September, while 1 defense was observed in December (n=1) and 2 defenses in April.

The shortest time to graduate was 17 months and the longest was 65 months, which may be related to students with special conditions, such as academic sabbatical leave or quota-based students. In Iran's university entrance exam, known as concourse, some universities have a specific quota for admitting students regardless of their actual rank in the concourse. They are called quota-based students. Further, 55% of students defended their thesis in less than 36 months of their legal deadline, and the rest (45%) defended the thesis within longer than 36 months. The time mode (when most students defended their thesis) was 37-42 months for defending the thesis (Table 1).

Based on Table 2, the minimum difference between the thesis score and GPA belongs to the rehabilitation management department, while the maximum was found for the audiometry department. In the optometry department, the mean score of the thesis was lower than the mean GPA.

According to Table 3, the variations in the GPA of female students were lower compared to men during the study years, but the trend of GP of male students was more ascending. On the other hand, the trend of difference between the thesis and GPA score was more descending among women than among men.

The point diagram of the GP and thesis scores of students showed considerable differences. The diagram of the thesis score among the girls is completely left-skewed, meaning that as it approaches 20 (equivalent to 100 in the Western scoring system), the density of scores increases. Meanwhile, the range of variations of GPA is 14-19.5 out of 20, and its distribution is closer to normal. The difference between thesis score and GPA across all students has been between -2.5 and +4 score, and slightly right-skewed. This difference was between -1.5 and +4 in men, and from -2.5 to +3.5 in women (Figure 1).

The correlation coefficient between the duration of the study and the thesis score was -0.289, which was significant with P=0.001. The correlation coefficient between the duration of the study and student GPA was -0.176, which was significant with P=0.047 (Figure 2).

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Table.1. Frequency of graduated MSc students in rehabilitation school by duration and subject

Duration (m)	Aud	RM	OM	OP	PT	SPT	ST	OT	Total
<24	1	0	3	3	5	0	0	1	13
25-30	4	2	1	2	5	1	1	2	18
31-36	4	4	4	4	5	1	4	12	38
37-42	2	7	8	3	5	6	6	10	47
43-48	0	0	2	0	2	0	4	2	10
>48	0	1	0	0	1	0	0	0	2
Sum	11	14	18	12	23	8	15	27	128
Mean±SD	32±5	38±5	37±8	32±8	34±10	39±4	39±7	37±5	36.08±7.31

Abbreviations: Aud: Audiology; RM: Rehabilitation management; OM: Optometry; OP: Orthosis and prosthesis; PT: Physical therapy; SPT: Sport physical therapy; ST: Speech therapy; OT: Occupational therapy; SD: Standard deviation.

The GPA difference between women and men was significant (P=0.000), but the difference in thesis score between men and women was not significant (P=0.054). Further, the difference between GPA and thesis score was insignificant in men and women (P=0.131).

The linear regression coefficient between the thesis score (dependent variable) and GPA (predictor variable) for each gender has been estimated as follows:

This means that by adding 1 score to the student's GPA, their thesis score is expected to increase by around 0.377. With the introduction of two variables of gender and duration of the study in this equation, the regression line equation (step-by-step) of the thesis will be as follows:

After applying step-by-step regression, the student's gender was removed from the model, but the variables of the duration and GPA had a significant effect on the

Table 2. Mean±SD of thesis score, GPA and difference between them in Rehabilitation School by gender and subjects

Subjects	Mean±SD						
	Thesis Score		Mean of GPA		Difference Between the Thesis Score and GPA		
	Female	Male	Female	Male	Female	Male	Total Difference
Aud	19.73±0.38	19.55±0.2	18.33±0.73	17.47±0.92	1.47±1.06	2.08±1.03	1.95±0.99
RM	18.93±0.77	18.21±0.88	18.48±0.64	17.72±0.63	0.45±0.7	0.49±0.51	0.44±0.92
OM	18.50±0.95	18.25±1.13	17.72±0.78	17.53±0.79	0.79±1.08	0.72±1.1	0.51±1.15
OP	19.40±0.55	18.84±1.08	17.94±1.06	17.25±1.18	1.46±1.29	1.06±1.36	1.08±1.25
PT	19.07±0.67	18.73±0.69	18.29±0.54	17.51±0.74	0.77±0.95	1.23±0.82	1.13±1.23
SPT	19.31±0.51	19.28±0.48	18.14±0.81	18.09±0.86	1.17±1.04	1.19±1.20	1.12±0.92
ST	18.89±1.33	18.25±1.53	18.15±1.02	17.49±1.26	0.74±0.55	0.76±0.87	0.86±0.66
OT	19.02±1.26	18.82±1.08	18.30±1.16	17.25±1.18	0.72±1.45	1.57±1.39	1.03±1.41

Abbreviations: MSc: Master of sciences; Aud: Audiology; RM: Rehabilitation management; OM: Optometry; OP: Orthosis and prosthesis; PT: Physical therapy; SPT: Sport physical therapy; ST: Speech therapy; OT: Occupational therapy; GPA: Grade point average; SD: Standard deviation.

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**Table 3.** Mean±SD of thesis score and GPA of master's students according to the year of graduation

Subjects	Mean±SD						
	Thesis Score		Mean of GPA		Difference Between the Thesis Score and GPA		
	Female	Male	Female	Male	Female	Male	Total Difference
2008	19.81±0.12	19.02±0.53	18.92±0.38	17.85±0.32	0.89±0.32	1.17±0.62	1.03±0.49
2009	19.34±0.59	*-	17.72±1.23	-	1.62±1.14	-	1.62±1.14
2010	19.26±0.48	18.31±0.28	18.56±0.35	16.72±0.17	0.70±0.59	1.59±0.42	1.03±0.68
2011	20±0.0	-	18.94±0.0	-	1.06±0.0	-	1.06±0.0
2012	-	18.88±0.88	-	16.06±1.96	-	2.81±1.07	2.81±1.07
2013	18.80±0.34	18.65±0.30	18.17±0.52	17.56±0.92	0.63±0.35	1.09±1.05	0.75±0.57
2014	19.40±0.55	19.15±0.58	18.12±0.54	17.68±1.27	1.29±0.82	1.47±1.30	1.34±0.93
2015	19.21±1.04	18.96±0.37	18.57±0.68	17.43±0.79	0.66±1.11	1.53±0.94	1.02±1.10
2016	18.70±1.56	18.14±1.24	18.29±0.70	17.54±0.92	0.41±1.57	0.60±1.24	0.55±1.30
2017	18.21±1.28	18.57±1.29	17.60±1.16	17.42±0.69	0.61±1.64	1.16±1.55	0.82±1.580
2019	19.13±0.91	18.94±1.40	18.02±1.01	18.08±0.82	1.12±0.94	0.86±1.08	0.99±0.99
2020	18.72±1.04	-	18.36±0.8	17.94±0.0	0.36±0.54	1.78±0.0	0.64±0.79

GPA: Grade point average; SD: Standard deviation. *Group with single sample.

linear regression equation and remained in the equation. This equation shows that per each month of extra duration of study for students, the thesis score decreases by 0.031. Very similar results were obtained using forward and backward methods.

Discussion

Based on the results of this study, the correlation between the duration of the study and the thesis score was negative. Due to the delay in defending the thesis, the duration of the study of most students was beyond the legal deadline. Also, a weak correlation was observed between the GPA and thesis score. Although the GPA
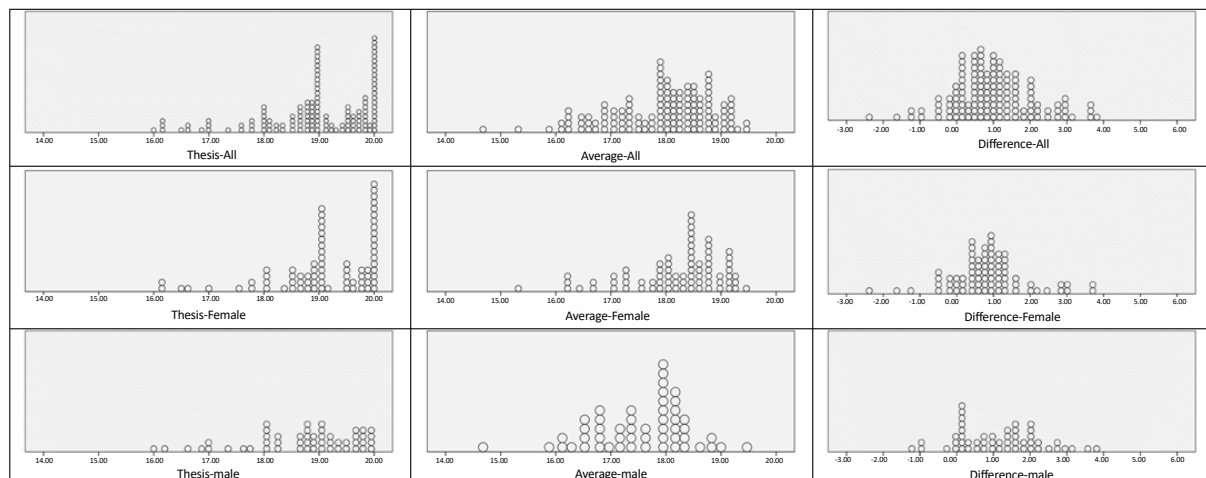
Figure 1. Chart of grade point average, thesis score, and its difference by gender

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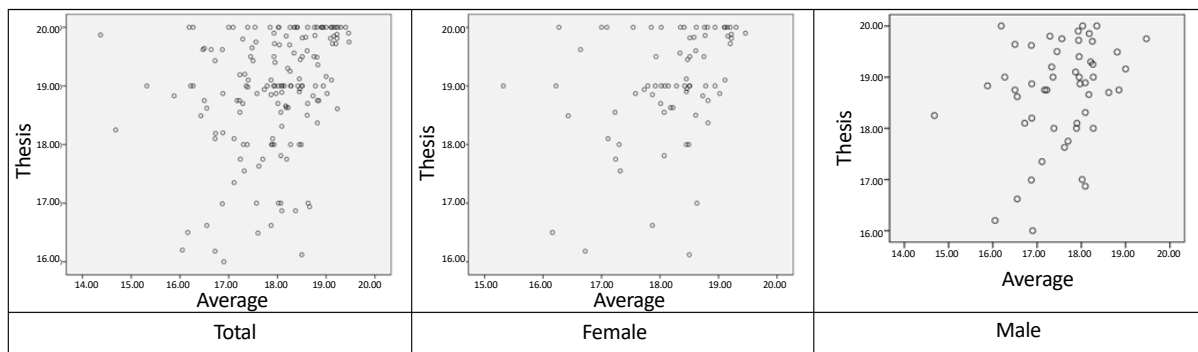
Figure 2. Scatter diagram of grade point average and thesis scores of students by gender

of women was higher than men, the statistical analyses indicated that their gender was not an effective factor for the acquisition of thesis score.

Based on the studies performed, no direct paper or article was found about the relationship between thesis scores and the GPA of students. Various studies have indicated that passing educational courses for promoting research skills can contribute to improve the quality of theses [2].

Passing a thesis as part of medical education does not have a long history, and accordingly, the conditions for conducting and scoring the thesis are not the same across different countries. For example, in England and Australia, it is not mandatory to pass a thesis or research project during the GP course. Further, in Germany, physicians can undertake medical practice without passing any research project. Meanwhile, in the US, the conditions are different and it is not mandatory to pass a thesis at most faculties. In Canada, less than half of the educational programs of internal residents require research in one of the three educational years [2]. In Iran, it is mandatory to pass the thesis for different fields at discontinuous Master's and PhD levels plus an MD degree.

In this research, a statistically significant difference was observed between the GPA of male and female students, but the difference in the thesis score between male and female students was not significant. Also, using the difference between GPA and thesis, no statistically significant difference was observed between girls and boys; however, regardless of gender, an inverse statistically significant relationship was observed between the duration of the study and the grade of the thesis and between the duration of the study and the student's GPA. It seems that female students defend their thesis later despite having higher grades and GPA. Although the student is the executor of the thesis, the professors are responsible for providing guidance and practical education on research. At the faculty of medi-

cine, supervisor and advisor professors, in addition to their educational activities at universities, are also active in their private clinics as well as government healthcare centers, and they perform most surgical operations or treatment interventions during their free hours. Thus, they have limited time to supervise and guide the student. In a study conducted by the research committee of students in Isfahan city, Iran, it was observed that one-fourth of supervisor professors have problems in dedicating a suitable time for guiding students. About 75% of supervisor professors believe that students tend to fabricate data and use perfunctory information to accelerate their job. Meanwhile, 58.3% of students believed that they used real data to analyze the results. Students prefer to defend their thesis as soon as possible, and they noted the insufficient time as well as the subjects of the thesis being repeated with sparse content as the reasons for their dissatisfaction with defending the thesis. Nevertheless, 45.8% of them regarded working on the thesis and defending it as a waste of time [3].

In Iran, September and February are the months leading to the beginning of the new semester, and the reason for the high statistics of defenses during these months (in this research) can reflect pressure for fulfilling the study deadline. Typically, students defend their thesis in case their thesis is ready and especially if they have an accepted paper.

Since the thesis score does not affect the total GPA, the prolongation of study years by intelligent students can be caused by not having an accepted paper. The mean thesis score of students of all fields was higher than 18.21 out of 20 (excellent rank), which can suggest the effect of the presence of advisor and supervisor professors on the verdict given by referees in thesis scoring.

Considering the policies of facilitating the course of graduation and preventing the accumulation of students, the model of graduation of students who have graduated

in less than 24 months should be used as a model for other students. Meanwhile, the reasons for prolonging the study period by students should also be investigated further. Note that 59 students who use extra extensions cause delays in publishing papers or defending the thesis, which in turn, is associated with a delay in the promotion of advisor and supervisor professors. Thus, another research is suggested to explore the time of publishing papers by students as well as the time of promotion of advisor and supervisor professors.

Since GPA is obtained during four academic semesters and based on the assessment of about 10 professors, it is more reliable than the thesis score that is obtained during two semesters and based on the assessment of two referees. Since the relationship between thesis score and GPA is weak, to investigate the quality of theses, and the quality of journals in which the papers adapted from these theses are published should be investigated. The low correlation between these two scores may induce doubt that their assessment process should be corrected and modified. Accordingly, the following are proposed:

1. Like many universities worldwide, advisor and supervisor professors should be present only in the defense session, and no opportunity and right exists to help the student in justifying the thesis. Also, when scoring the thesis, they should be asked to leave the meeting simultaneously with the student.

2. The thesis should be based on the order and financial support of an organization or institute outside the university so that in addition to practicality and utility, the process of implementation can be done more carefully with greater supervision.

Conclusion

Although the GPA of female students was better, the statistical analysis indicated that the student gender was not an effective factor in getting a thesis score. Considering the constancy of academic courses across all groups, the correlation between the duration of the study and the thesis score was negative. It seems that most students spend more time at university due to the delay in defending the thesis.

Ethical Considerations

Compliance with ethical guidelines

The Ethics Committee of Iran University of Medical Sciences (IUMS) approved the study protocol (Code: IR.IUMS.REC.1398.672).

References

[1] Ahmadi F, Shiri Ahmad Abadi ME. Data mining in teacher evaluation system using WEKA. International Journal of Computer Applications. 2013; 63(10):14-8. [Link]

[2] Changiz T, Adibi P, Hosseini M, Tootoonchi M. [Viewpoints of supervisors about the problems in the process of dissertations for general medicine program Isfahan University of Medical Sciences (Persian)]. Iranian Journal of Medical Education. 2003; 3(1):23-33. [Link]

[3] Isfahan University of Medical Sciences Student Research Committee, Report of the first phase of the dissertation quality improvement project. Isfahan: Isfahan University of Medical Sciences, Vice Chancellor for Research; 2000.

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مقاله پژوهشی

بررسی ارتباط بین نمره پایان‌نامه و معدل نمرات دانش آموختگان کارشناسی ارشد دانشکده توان بخشی از ۱۳۸۷ تا ۱۳۹۸

سید حسن صانعی۱ ، لاله لاجوردی۲ ، مهتاب روحی عزیزی۱ ، بهنوش وثاقی قراملکی۱

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چکیده

مقدمه انتخاب موضوع پایان‌نامه از مهم ترین نگرانی‌های دانشجویان کارشناسی ارشد است زیرا فارغ التحصیل شدن دانشجو در گرو دفاع از پایان‌نامه است. سوال اصلی این تحقیق این بود که آیا دانشجویان با معدل کمتر برای پایان‌نامه نیز نمره کمتر و زمان بیشتری صرف می‌کنند و بالعکس دانشجویان دارای معدل بالا عملکرد بهتری برای پایان‌نامه دارند؟.

مواد و روش ها تمام فارغ التحصیلان ارشد دانشکده علوم توانبخشی طی سال‌های ۱۳۸۷ تا ۱۳۹۸ که در سیستم کامپیوتری ثبت شده بودند، شرکت داده شدند. با استفاده از نتایج یک بررسی مقدماتی بر روی ۳۲ فارغ التحصیل، تعداد نمونه لازم برای اجرای تحقیق، ۱۱۳ نفر محاسبه شد. با استفاده از روش نمونه‌گیری طبقه‌بندی به هر طبقه (رشته سال) حداقل یک نمونه اختصاص یافت و تعداد نمونه ۱۲۸ نفر شد.

یافته‌ها در این مطالعه ضریب همبستگی بین مدت زمان تحصیل با نمره پایان‌نامه برابر با ۰/۲۸۹– (P=۰/۰۰۱) معنی‌دار و ضریب همبستگی بین مدت زمان تحصیل با معدل دانشجو برابر با ۰/۱۷۶– (P=۰/۰۴۷) به سختی معنی‌دار شد. برآورد ضریب همبستگی پیرسون بین نمره پایان‌نامه و معدل برای کل فارغ التحصیلان برابر با P=۰/۳۵۲ (در دختران برابر با P=۰/۳۳۸ و در پسران برابر با P=۰/۲۸۴) شد. بر طبق نتایج این تحقیق به ازای هر ماه تحصیل بیشتر دانشجو، ۰/۰۳۱ نمره از نمره پایان‌نامه کم می‌شود.

نتیجه‌گیری : اکثر دانشجویان بدلیل تاخیر در دفاع پایان نامه بیش از مدت قانونی در دانشگاه حضور داشته‌اند. هرچند متوسط معدل دانشجویان کارشناسی ارشد خوب بوده است. دختران بهتر بوده‌اند اما تجزیه و تحلیل‌های آماری نشان داد که جنس دانشجو عامل موثری برای کسب نمره پایان‌نامه نبوده است. با توجه به ثابت بودن دوره آموزشی در تمام گروه ها، همبستگی منفی بین مدت زمان تحصیل و نمره پایان‌نامه دیده شد و به نظر می‌رسد اکثر دانشجویانی که مدت زمان بیشتری را سپری می‌کنند بدلیل تاخیر در دفاع پایان‌نامه بوده است.

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