Differences in Academic Performance Between Male and Female Medical Students in Kirkuk University

*Mohammed Mustafa Mohammed, **Iqbal Sameen Ali, ***Sabah Haseeb Hasan

*Department of *community medicine, college of Medicine, Kirkuk University.*

** Department of *Physiology, College of Medicine, Kirkuk University.*

*** Department of *Statistics, College of Administration and Economics, Kirkuk University.*

Abstract:

Background: The student's assessment can be achieved by written examination which was considered an essential method.
Aim of the study: The aim and objectives of the study is to measure the time spent by the students to finish their written final examination, to compare it with the proposed time, to find any difference according to sex and their examination scores, and to find any correlation between the time spent in examination and scores obtained by students.
Subjects and Methods: A cross-sectional study was carried out during May- June; 2011 in the college of medicine, Kirkuk University. Data obtained during the final written examination; and scores were obtained from the examination committee with permission of the Dean of the college.
Results: Female students spent more time during examination than male students in all subjects (except in parasitology, surgery and psychiatry in the 3th, 4th and 5th grade respectively). There was a very weak correlation between the scores obtained by students and time spent by them during examination.
Conclusion: There were differences between sex, time and scores obtained by the students.
Key word: Students, Gender, Academic performance.

Introduction:

Males and females interact differently with the learning environment; and woman's standards and goal are responsive to social and environmental influences [(1)]. There is an increase in stress during the course of medical examination, but it unknown whether the distress is chronic and persistent or episodic because follow-up covering the whole training program are lacking [(1)]. There is a need for examination of the students at the end of each academic years in order for him or her to pass it in success and to shift to other grade, so that the examination represent an indicator about knowledge and understanding of the curricula by students [(2)]. There is a gap between the sexes in relation to the time spent during examination and scores obtained by them [(3)]. The aims of the study are measuring the time spent by the medical students to complete their examination and to find any correlation between the time spent by the students during examination and their scores obtained by them.

Subjects and Methods:

This cross-sectional study was carried out during the final written examination (first trial) during the period of May-June; 2011 and included (306) medical students from the first grade –six grade,

in Kirkuk university. A special form was prepared by the researches to collect data from the students including the following information: Student's name, sex, subject of examination and time (in minutes) spent by the students to finish his (her) examination. The time was calculated by the observers of the examination hall by using the clock of the hall. The collected data were entered in the computer; and students t-test, mean of the marks and time spent by the students and the correlation between the time spent and marks got by the students were carried out, and a P-value of ≤ 0.05 was considered as statistically significant[4]. The students' assessment can be achieved by written examination which was considered one of the essential methods. The total final theoretical written examination is forty degrees out of one hundred degrees in subjects where there are final practical examination and sixty degrees out of one hundred degrees in subjects where there are practical examinations mean while the pass mark is fifty degree (often the addition of the practical degree).

Results:

Table (1) shows the frequency of the students by grade (G.), type of subject, sex and time spent by them, during the examination. For G.1, the females spent more time than males in most of the subjects (within range 74.37-174.75 minutes for males and 82.77-175.74 minutes for females), and the same was true for the other grades and most of the subjects but the differences were not significant except (significant) in the following grades and subjects: G2: biochemistry, G3: microbiology, G6: Pediatric ($P<0.05$).

Regarding the scores (marks) that obtained by the students as shown in table 2; the females scores in most subjects were slightly higher than males (16.91-43.21 for males and 19.11- 43.91 for females); while the reverse is true in the following grades and subjects (G.1 physics, G.4 medicine and surgery, G.5 psychiatry and medicine); but the differences not significant except in physics. Table (3) shows the correlation between the time spent during the examination and the marks got by the students according to sex and type of subjects, where in most of the grades, subjects and sexes there were a very weak association; and either positive in some subjects or the negative in other subjects in both sexes.

Table (1): Frequency distribution of the students by Grade (G), sex and time spent during examination.

Grade & subject	Sex	Number	Mean Minutes	Standard deviation	T-test	d.f.	P	Confidence interval
G1 Biology	M	22	121.14	22.19	-0.01	46	< 0.05	9.27
	F	26	137.8	22.85				8.78
G1 Physics	M	22	78.45	22.04	-3.4	46	< 0.05	9.21
	F	26	91.12	18.5				7.11
G1 Chemistry	M	22	150.54	20.32	-9.14	46	< 0.05	8.49
	F	26	159.03	19.55				7.51
G1 Terminology	M	22	107.91	22.06	-7.51	46	< 0.05	9.22
	F	26	123.15	27.86				10.7
G1 Anatomy	M	22	113.73	25.53	-1.89	46	< 0.05	10.66

	F	26	131.11	20.65				7.94
G2 Biochemistry	M	20	126.65	29.26	0.007	48	< 0.05	12.82
	F	30	148.23	25.09				8.97
G2 Physiology	M	22	144.3	34.15	0.47	48	> 0.05	14.96
	F	26	151.17	31.4				11.23
G2 Anatomy	M	22	131.9	27.79	0.21	48	> 0.05	12.17
	F	26	142.5	29.5				10.56
G2 Histology	M	22	114.75	34.2	0.34	48	> 0.05	15
	F	26	123.53	29.89				10.69
G2 Embryology	M	22	105.7	36.07	0.19	48	> 0.05	15.8
	F	26	117.53	26.38				9.44
G3 Medicine	M	19	127.84	29.62	0.2	52	> 0.05	13.31
	F	35	139.o6	30.64				10.15
G3 Community medicine	M	19	121.32	35.65	0.74	52	> 0.05	16.03
	F	35	124.94	39.3				13.02
G3 Parasitology	M	19	118.05	27.31	0.71	52	> 0.05	12.28
	F	35	115	29.78				9.86
G3 Surgery	M	19	74.37	20.1	0.14	52	> 0.05	9.04
	F	35	82.77	19.09				6.32
G3 Pharmacology	M	19	115.63	38.49	0.14	52	> 0.05	17.31
	F	35	131.26	35.31				11.69
G3 Pathology	M	19	137.63	29.97	0.5	52	> 0.05	13.48
	F	35	143.57	30.76				10.19
G3 Microbiology	M	19	144.05	29.7	0.01	52	< 0.05	13.35
	F	35	162.8	22.51				7.46
G4 Community medicine	M	16	88.75	17.46	0.08	45	> 0.05	8.56
	F	31	102.03	26.72				9.4
G4 Obstetrics	M	16	113.25	38.52	0.34	45	> 0.05	18.87
	F	31	122.03	24.33				8.56
G4 Surgery	M	16	158.81	21.83	0.68	45	> 0.05	10.7
	F	31	156.32	17.86				6.29
G4 Medicine	M	16	151.81	30.55	0.84	45	> 0.05	14.96
	F	31	153.48	24.68				8.68
G4 Pediatrics	M	16	104.56	39.39	0.09	45	> 0.05	19.3
	F	31	122.58	30.99				10.91
G5 Dermatology	M	19	102.89	32.11	0.89	52	> 0.05	14.44
	F	35	103.09	31.36				10.39
G5 Ophthalmology	M	19	139.05	40.15	0.39	52	> 0.05	18.05
	F	35	147.49	30.64				10.15
G5 Psychiatry	M	19	137.84	34.22	0.7	52	> 0.05	15.38
	F	35	134.31	31.18				10.33
G5 Gynecology	M	19	135.53	29.21	0.5	52	> 0.05	13.13
	F	35	140.63	24.44				8.09
G5 Surgery	M	19	137.84	30.55	0.11	52	> 0.05	13.74
	F	35	149	20.32				6.73
G5 Medicine	M	19	148.58	30.52	0.21	52	> 0.05	13.72
	F	35	157.94	22.86				7.53
G6 Gynecology	M	20	159.1	55.25	0.19	52	> 0.05	8.74

and Obstetrics	F	34	165.09	13.62				4.58
G6 Pediatrics	M	20	146.9	26.91	0.004	52	< 0.05	11.79
	F	34	162.68	11.04				3.73
G6 Medicine	M	20	174.75	5.95	0.56	52	> 0.05	2.61
	F	34	175.74	5.97				2
G6 Surgery	M	20	157.65	19.24	0.84	52	> 0.05	8.43
	F	34	158.62	15.88				5.34

Table (2): Frequency distribution of the students according to Grade, subject, sex and mean scores obtained by students.

Grade & subject	Sex	N	Mean marks%	SD	T-test	d.f.	P	Confidence interval
G1 Biology	M	22	26.34	5.64	-3.38	46	< 0.05	2.36
	F	26	27.61	4.65				1.79
G1 Physics	M	22	28.04	6.86	-1.76	46	< 0.05	2.86
	F	26	25.94	5.31				2.04
G1 Chemistry	M	22	24.25	4.91	-2.74	46	< 0.05	2.0.5
	F	26	25.99	3.74				1.44
G1 Terminology	M	22	33.91	10.02	-1.44	46	< 0.05	4.19
	F	26	38.62	6.78				2.61
G1 Anatomy	M	22	23.98	4.84	-3.93	46	< 0.05	2.02
	F	26	24.26	3.83				1.47
G2Biochemistry	M	20	19.48	7.19	0.03	48	< 0.05	3 15
	F	30	23.67	6.31				2.26
G2 Physiology	M	22	20.03	5.75	0.55	48	> 0.05	2.52
	F	26	21.05	6.07				2.17
G2 Anatomy	M	22	19.58	5.4	0.02	48	< 0.05	2.36
	F	26	22.78	4.14				1.48
G2 Histology	M	22	23.21	4.09	0.51	48	> 0.05	1.79
	F	26	24.39	7.22				2.58
G2 Embryology	M	22	35.37	8.72	0.11	48	> 0.05	3.82
	F	26	39.1	7.47				2.67
G3 Medicine	M	19	22.04	4.51	0.06	52	> 0.05	2.03
	F	35	24.9	5.46				1.81
G3 Community Medicine	M	19	40.26	5.67	0.08	52	> 0.05	2.55
	F	35	43.06	5.41				1.79
G3 Parasitology	M	19	26.72	2.26	0.33	52	> 0.05	1.02
	F	35	27.51	3.08				1.02
G3 Surgery	M	19	43.21	6.01	0.68	52	> 0.05	2.7
	F	35	43.91	5.82				1.92
G3 Pharmacology	M	19	16.91	6.96	0.21	52	> 0.05	3.13
	F	35	19.11	5.6				1.85
G3 Pathology	M	19	17.18	7.59	0.08	52	> 0.05	3.41
	F	35	20.99	7.54				2.49
G3 Microbiology	M	19	19.9	5.25	0.08	52	> 0.05	2.36
	F	35	22.02	3.44				1.14
G4 Community Medicine	M	16	20.38	2.85	0.11	45	> 0.05	1.39
	F	31	21.87	3.04				1.07

G4 Obstetrics	M	16	27.56	2.56	0.67	45	> 0.05	1.25
	F	31	28.03	3.98				1.4
G4 Surgery	M	16	21.56	3.6	0.57	45	> 0.05	1.67
	F	31	20.84	4.41				1.57
G4 Medicine	M	16	22.75	3.77	0.23	45	> 0.05	1.48
	F	31	21	4.99				1.76
G4Pediatrics	M	16	20.43	5.69	0.59	45	> 0.05	3 2.79
	F	31	21.29	4.76				1.68
G5Dermatology	M	19	18.95	5.89	0.77	52	> 0.05	2.65
	F	35	19.37	4.53				1.5
G5 Ophthalmology	M	19	23.58	4.17	0.58	52	> 0.05	1.87
	F	35	24.11	2.89				0.95
G5 Psychiatry	M	19	25.79	4.8	0.13	52	> 0.05	2.16
	F	35	24.17	2.99				0.99
G5 Gynecology	M	19	23.63	6.77	0.02	52	< 0.05	3.04
	F	35	26.91	3.62				1.2
G5 Surgery	M	19	23.32	4.81	0.78	52	> 0.05	2.16
	F	35	23.63	3.24				1.07
G5 Medicine	M	19	22.84	7.4	0.87	52	> 0.05	3.32
	F	35	22.6	3.88				1.29
G6 Gynecology and Obstetrics	M	20	55.25	5.44	0.57	52	> 0.05	2.38
	F	34	54.21	7.01				2.36
G6 Pediatrics	M	20	53.35	4.28	0.49	52	> 0.05	1.88
	F	34	52.32	5.7				1.91
G6 Medicine	M	20	53.65	5.7	0.83	52	> 0.05	2.54
	F	34	53.26	6.8				2.13
G6 Surgery	M	20	50.4	4.68	0.73	52	> 0.05	2.05
	F	34	50.85	5.64				1.9

Note: The marks a have 40 belong to subjects in which their marks are 60 and not 40 (haven't practical exam).

Table (3): Correlation between time spent during the examination and marks obtained by students according to the grades and subjects.

Correlation coefficient (r)		
Grade	Male	Female
Grade one		
Biology	-0.006	-0.109
Physics	-0.477	0.184
Chemistry	-0.042	-0.448
Terminology	-0.128	-0.051
Anatomy	0.367	0.089
Grade two		
Biochemistry	0.388	0.233
Physiology	0.301	0.107
Anatomy	0.496	0.126
Histology	0.018	0.293
Embryology	0.180	0.228
Grade three		
Medicine	-0.099	0.34

Community Medicine	0.241	0.283
Parasitology	-0.118	0.176
Surgery	0.423	0.262
Pharmacology	0.513	0.526
Pathology	0.538	0.236
Microbiology	0.344	0.06
Grade four		
Community Medicine	0.05	-0.373
Obstetrics	0.312	-0.032
Surgery	0.339	-0.083
Medicine	0.424	0.061
Pediatrics	0.101	-0.154
Grade five		
Dermatology	0.383	0.11
Ophthalmology	0.273	0.062
Psychiatry	0.327	0.099
Gynecology	0.622	0.088
Surgery	0.744	0.33
Medicine	0.757	0.262
Grade six		
Gynecology and Obstetrics	0.037	-0.171
Pediatrics	0.192	-0.131
Medicine	0.16	0.031
Surgery	0.141	0.096

Discussion:

The final medical examination is considered an important process in evaluation of the students; which needed for them to success in order to pass for the next grade [5]. Friscgenschiager *et al* found that are some factors such as academic ability, learning styles, ethnicity and sex play a role in success in medical examination and students performance [3, 6]. Other researchers suggest social, anxiety and environmental factors have an effect in the sex differences in examination and high anxiety, make the performance of the student more poorly than in those with low level of anxiety [7-9], Also Nadeir *et al* found that academic achievement is strongly influenced by demographic and psychological factors [10]. This study shows that females spent more time than males and their scores are also higher; results that are identical with similar study done by Niazi and Isa in Iraq and by Al-Tawil in college of medicine, Hawler medical university [2, 11], and this may be attributed to provision of better answers, and spending more time by the students in reviewing their answers. Niazi Fergnson *et al*, suggest in their studies that sex difference in medical examination still need further researches [2, 12]. This study shows that although females obtained more scores than males in all grades but they were not insignificant in some of them and this was identical with study done Niazi and Isa [2], but their differences were also non insignificant and here one must not forget the type of the questions, the required answers, the knowledge ability and the anxiety status of the student that may play a role in the time spent in examination

and the scores obtained by the students; where the students with more knowledge and ability spent less time and get higher scores [13,14,15]. This study shows also a very weak association (in both sexes) between time spent during the examination and the students score and this may be attributed to the better utilizing of the time by the students for getting better scores even spending more time during the examination.

Conclusion:

1. Females spent more time than males during examination.
2. Little differences are shown regarding the academic achievement between males and females.
3. There is very weak association between the times spent during examination and student's score.

Recommendation:

There is no need to alter the time required for the final written examination, but there is a need for further studies for sex difference in examination.

Acknowledgment:

Many thank to the teaching staff of the college of Medicine, Kirkuk University for their help in data collection.

References:

[1]. Niemi P.M., Vaniiomak P.T. Six-year medical programme, Medical Teacher, 2006; 28(2): 136-41.
[2]. Niazi AD; Isa SA. Gender differences in achievements among students of the Iraqi college of medicine, J. of –Salama for Science, 2004; 1 (2): 300-305.
[3]. Sax L., Yarper C. Origins of the gender gap; pre-college and college influences on differences between men and women, paper presented at the Annual meeting of the association for Institutional Research, San Diego, May, 2005.
[4]. Essex-soril D. Medical Biostatistics, Appleton and Lange USA, 1995; 140, 247.
[5]. Mc Donough CM; Horgan A,. Codd MB,. Casey RP. Gender differences in the results of the final medical examination at University College Dublin. Med. Educ, 2000; 34(1): 30-34.
[6]. Holmes FF., Holmes GE., Hassanien R. Performance of male and female medical students in a medicine Clerkship, JAMA, 1978; 239 (21): 2259-2262.
[7]. Arnot M., Gray J., James M., Ruddouck J. Recent research on gender and educational performance, Journal of Educational measurement, 1998; OFSTED Reviews of Research series) (London: The Stationery Office).
[8]. Altermatt MR., Kim ME. Can anxiety explain sex differences in college entrance exam scores. The Journal of College Admission, 2004; 183: 6-11.
[9]. De Saintonge DR., Kim ME., Dunn DM. Gender and achievement in clinical medical students: a path analysis, Med Educ, 2001; 35(11): 1024-33.
[10]. Nadeir H., Abdullalah R., Aizan H., Kumar S. Creativity, Age and Gender As Predicators of Academic Achievement Among Under graduate students, Journal of American Science, 2009; 5(5): 101-112.
[11]. Al- Tawil N. Sex and time spent during Examination as predictors of scores among Medical Students, Middle East Journal of Family Medicine, 2009; 7(10): 18-24.
[12]. Ferguson E., James D., Madeley L., Factors associated with success in medical school: systematic review of the literature. BMJ 2002 ;(324): 952-957.
[13.] Frischenschlager O., Haidinger G., Mitterauer L., Factors associated with academic success at Vienna medical school: Prospective Survey Croat Med. J, 2005; 46(1): 58-65.
[14]. Moses A., Daniel O., Educational Research and Review July, 2008; 3(7): 242-245.
[15]. Elwood J, Carlisle K., Gender and Achievement in Junior and Leaving Certificate Examination, 200/2002, Queen University Belfast, NCCA, 2003; ISSN 1649-3362.