

# Perceived stress among male medical undergraduates at College of Medicine, Majmaah, Saudi Arabia

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## ABSTRACT

**Objectives:** This study was conducted to explore the level of perceived stress in male medical undergraduates. In addition, this study also examines the change in perceived stress with progressing academic years.

**Methods:** This was a cross sectional study conducted at College of Medicine, Majmaah, Saudi Arabia. The students were contacted in the class, and their participation was voluntary. All one hundred and thirty-five medical students of first, second and third year were targeted for study whose age range was 18-23 years. A 10-item perceived stress scale (PSS-10) questionnaire was used to measure the level of stress among the subjects.

**Results:** One hundred five subjects participated in the study. Majority of students belonged to year 1 (n=50, 47.6%) of which 5 students had least stress, 24 had mild stress; 19 had moderate stress and 2 had severe stress. Almost one third of the students (n=34, 32.4%) were studying in year 2 of which 19, 11 & 2 students had mild, moderate and severe stress respectively. Similarly one-quarter (n=21, 20.0%) of students were studying in year 3 of which 5 students had least stress, 6 had mild stress and 9 students had moderate stress.

**Conclusions:** The stress among our students was found to be higher than other medical colleges in Saudi Arabia. However, no significant difference in stress level was found between different academic years.

**Keywords:** Perceived stress, Perceived stress scale-10, undergraduate medical students.

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## Introduction

In psychology, the term stress means "any environmental or physical pressure that elicits a response from an organism" and this response is important for survival of an organism to cope with the changing

environment[2]. Studies have shown that medical students perceive stress more than corresponding non-medical students[3]. Some stress is beneficial in medical undergraduates which results in a drive for acquisition of sound knowledge and competitiveness. Stress in both suboptimal and excessive concentration is counterproductive that results in boredom and lack of interest on one hand and diseased states like total burnout or suicidal ideation on the other extreme[4,5]. A persistent and chronic stress can ultimately lead to permanent personality changes that can siphon in later life as junior doctors. The present study was conducted to determine the level of perceived stress in male medical undergraduates in college of medicine Majmaah KSA and to assess any change in the level of perceived stress in the progressing academic year.

## **Methods**

### **Setting**

This cross-sectional study was carried out at College of Medicine, Majmaah University, Saudi Arabia among male medical students. Ethical approval was obtained from Majmaah Research Institutional Ethics Committee of Basic & Health Science, Research Center Majmaah. The data was collected from November 2013 to April 2014.

### **Participants**

The College of Medicine, Majmaah University is newly established medical college in Kingdom of Saudi Arabia. It's educational program commenced in 2011. The total number of enrolled male students at the start of the study were one hundred thirty-nine and all students were included in the study. The age range of the participants was from 18-23 years. The participation of the students was purely on a voluntary basis, and a ten item perceived stress scale (PSS-10) was introduced at the end of teaching activities to receive high response rate. The medical students were explained about the objectives of the study and the procedure of filling the questionnaire. Students were advised to fill the questionnaire at their own time of preference. One hundred fifteen male students participated in the study that represented around 82.7% of total sample size. Ten responses were excluded from the study because of incomplete or incorrect filling of forms. The final number of students that were included in the study was 105.

### **Stress measurement Instrument (PSS)**

A ten-item perceived stress scale (PSS-10) comprising six negative and four positive items was used in the study. Studies showed that perceived stress scale (PSS) is a validated instrument used to measure the perception of stress among different populations [6]. It assesses the extent to which conditions in one's life can be evaluated as stressful[7]. The Cronbach's  $\alpha$  of PSS-10 was found to be 0.78 in Haris Poll sample and 0.91 in 2006 and 2009 e National sample[8]. In the last ten years, PSS-10 has considerably been used in the studies as shorter version makes studies more feasible with good internal consistency and test-retest reliability[9].

Responses of the participants were collected for each question on 5-point Likert scale ranging from 0 (never) to 4 (very often) about their feeling and thought during last one month. Reverse scoring was done for four positive stated items number 4, 5, 7, 8 and then PSS-10 scores were calculated by adding scores of all ten items. The scores range from 0 to 40 with higher scores indicative of higher level of stress. PSS-10 score of 0 to 9 was considered as first quartile, 10 to 20 as second quartile, 21 to 30 as third quartile and fourth quartile with PSS-10 score of more than 30. The first quartile belonged to students that had no or very low level of stress and this was labeled as "Least Stress". The second quartile was labeled as "Mild Stress", third quartile as "Moderate Stress" and fourth quartile was labeled as "Severe Stress". All time stress was calculated by adding the numbers of students in second, third and fourth quartiles and calculating the percentage from the total number of students.

### **Data collection**

Complete enumeration method was used to collect the data. All cases were excluded from the study who refused to participate in the study or returned the incompletely filled questionnaire. Trained staff collected the completed questionnaire from the students. The identity of the students was kept confidential.

### Statistical Analysis

The data was entered and analyzed using SPSS 22.0. Mean±S.D was reported for quantitative variables. Frequencies and percentages were reported for qualitative variables. One way Analysis of Variance (ANOVA) was applied to compare the mean score with years; post hoc Turkey's test was applied to observe which group mean differs. Pearson Chi-square and Fisher Exact tests were applied to observe associations between qualitative variables. A p-value of <0.05 was considered as statistically significant.

### Results

One hundred and five responses were included in the study. The mean PSS score in our study was 18.2±6.9. Majority of students belonged to year 1 (n=50, 47.6%) of which 5 students had least stress, 24 had mild stress, 19 had moderate stress and 2 had severe stress. Almost one third of the students (n=34, 32.4%) were studying in year 2 of which 19, 11 & 2 students had mild, moderate and severe stress respectively. Similarly, about one quarter (n=21, 20.0%) of students were studying in year 3 of which 5 students had least stress, 6 had mild stress and 9 students had moderate stress as shown in Figure 1. All time stress in our study was 88.57%.

Majority of the students (20%) studying year 1 reported to have stress "quiet – very frequently". 30% of students studying in year 2 reported to have stress "quiet – very frequently". 15% of students studying in year 3 reported to have stress "quiet – very frequently".

When asked about "*In the last month, how often have you been upset because of something that happened unexpectedly*" majority of the students (n=32, 30.5%) said sometimes, often got upset (n=28, 26.7%), quiet frequently (n=25, 23.8%), never got upset (n=09, 8.6%) and (n=11, 10.5%) got upset very frequently. When this item was associated with years of study, no significant association was observed (p=0.591).

"*In the last month, how often have you felt that you were unable to control the important things in your life*" majority of the students (n=29, 27.6%) said sometimes, twenty-six (24.8%) said never, almost (22%) students said often, quiet frequently (n=20, 19%) and seven (6.7%) students said very frequently. When this item was associated with years of study, no significant association was observed (p=0.561).

"*In the last month, how often have you felt nervous and stressed*" majority of the students said often (n=30, 28.6%), twenty five (23.8%) felt nervousness and stress quiet frequently and very frequently respectively. Eighteen (17.1%) students said sometime and a small percentage of students (n=07, 6.7%) said never. When this item was associated with years of study, no significant association was observed (p=0.112).

"*In the last month, how often have you felt confident about your ability to handle your personal problems?*" majority of the students said sometimes (n=31, 29.5%), almost one quarter of the students said often and never respectively, twenty (19.0%) students quiet frequently handled their personal problems and very small number of students (n=05, 4.8%) said very frequently. When this item was associated with years of study, no significant association was observed (p=0.445).

"*In the last month, how often have you felt that things were going your way*" almost one third of the students said often and sometimes respectively. Twenty-two (21.0%) said quiet frequently and a small percentage of students said very frequently (n=08, 7.6%). When this item was associated with years of study, no significant association was observed (p=0.944).

"*In the last month, how often have you found that you could not cope with all the things that you had to do*" majority of the students said sometimes (n=39, 37.1%), one quarter of the students said often, nineteen (18.1%) said quiet frequently, fourteen (13.3%) said never and few students (n=07, 6.7%) said very frequently. When this item was associated with years of study, no significant association was observed (p=0.561).

"*In the last month, how often have you been able to control irritations in your life*" majority of the students said often (n=35, 33.3%), more than one quarter of the students (n=30, 28.6%) said sometimes, fourteen (13.3%) said quiet frequently, eighteen (17.1%) said never and a small percentage of students (n=8, 7.6%) said very frequently. When this item was associated with years of study, no significant association was observed (p=0.558).

“In the last month, how often have you felt that you were on top of things” majority of the students said often (n=44, 41.9%), one quarter of the students said sometimes, thirteen (12.4%) said never and quiet frequently respectively and a small percentage of students (n=8, 7.6%) said very frequently. When this item was associated with years of study, year 1 students felt they were on top of things in last month as compared to year 2 and year 3 students (p=0.046).

“In the last month, how often have you been angered because of things that were outside of your control” majority of the students said sometimes (n=32, 30.5%), one quarter of the said quiet frequently, eighteen (17.1%) said often, and 15% students said never and very frequently respectively. When this item was associated with years of study, no significant association was observed (p=0.613).

“In the last month, how often have you felt difficulties were piling up so high that you could not overcome them” majority of the students said sometimes (n=29, 27.6%), twenty-four (22.9%) said often and quiet frequently, seventeen (16.2%) said never and a small percentage of students (n=12, 11.4%) said very frequently. When this item was associated with years of study, no significant association was observed (p=0.704). (Table 1&3)

Moreover, mean scores were calculated for all the responses of students. No significant difference was observed between years of study and mean response scores (p=0.728). (Table 2).

### **Discussion**

Since the turn of a new millennium, there has been a rapid increase in inauguration of medical colleges in Saudi Arabia from 5 to 25 and this number increasing[10]. College of Medicine, Majmaah University was established in 2010. The college of medicine follows outcome based integrated hybrid curriculum that applies mix teaching and learning methods, i.e., conventional teaching methods blended with innovative teaching and learning approach. The content is delivered through a system-based module that promotes both vertical and horizontal integration. Various studies have been conducted in Saudi Arabia to probe stress among medical students in different medical and dental colleges. However, majority of those studies were conducted in well-established and acknowledged universities of Saudi Arabia. We conducted this study to analyze level of stress in medical students in this newly established medical college of Majmaah University in Saudi Arabia.

The mean PSS-10 score in our participants was 18.2 with a standard deviation of  $\pm 6.9$ . The average PSS-10 is considered 14.2 for corresponding age group of 18-29 years for male gender in general public[11]. Our result show that medical students in our college have higher mean PSS-10 score than commensurate male population in public. Our results are in accordance with a study conducted by Sunni and Latif in College of Medicine, University of Dammam, Saudi Arabia in 2014 on sample size of 80 medical students in whom the mean PSS-10 score was 17.31[10]. Another study conducted in Saudi Arabia using PSS-10 scale by Abeer Saad Eswi *et al.* on 100 nursing students in Jeddah showed mean score of 23.3 [12] while Zeyad H. Al-Sowygh in his study on 425 dental students in King Saud University Riyadh showed mean PSS-10 score of 22.82[13]. These results show that medical students in our college on an average are more stressed compared with common masses but are less stressed in contrast to dental and nursing students.

All time perceived stress in our students was 88.57% that is higher than other studies carried out in Saudi Arabia. For example, Sani *et al.* found that 71.9% of medical students in Jizan University, Saudi Arabia perceived all time stress[14]. Sunni *et al.* reported 71.7% prevalence of all time perceived stress [10] in Dammam Saudi Arabia. Abdulghani published his findings in a study conducted in 2006 at College of Medicine; King Saud University on 495 medical students that prevalence of all time perceived stress was 57%[15]. Similarly, a study from Pakistan conducted at Ziauddin Medical College Karachi on 125 medical students showed that 80.3% of students perceived stress during their education at medical school[4]. A study conducted at Isfahan medical science students Iran in 2010-2011 on 387 participants revealed that 76.1% of science students perceived stress during their academic years[16]. Although, the prevalence of all time stress was higher, yet the mean PSS-10 score was lower than corresponding medical colleges in KSA. The possible reasons for difference in prevalence of all time stress from other studies could be use of different stress instrument, proper distribution of quartiles in PSS-10 in our study or an actual difference.

The perceived stress scale is a tool that determines the degree to which an individual assesses recent life as stressful. It does not diagnose or categorize individuals as stressful or stress-free; rather this scale scatters the study population on a line gradation with extreme left position denotes least



stressed/stress-free compared to most stressed subject on extreme right. Therefore, only comparative statistics is permissible along this line scale [17]. The term all time stress has been used by various authors in their studies but very few have defined this term. Moreover, few authors have clearly described apportionment of the perceived stress scale results into quartiles using different cut-offs [10, 17, 18]. This invariably has an influence on the results. Studies with different stress scales should be compared with care. For example, Kessler Psychological Distress Scale (K-10) is aimed to discern non-specific psychological distress whereas general health questionnaire (GHQ-12) is a screening tool for general psychiatric morbidity [19].

Our study contradicts observations by authors who described that level of stress was related significantly with the academic year of medical education [14, 15, 20]. The difference in mean PSS-10 score in all three years in our setup was not statistically significant with p value 0.728 (Table 2). The possible explanation could be skillful mapping of curriculum over the study years in College of Medicine Majmaah University. Moreover, each faculty member in College of Medicine Majmaah is designated as academic supervisor for two to three medical students. This mentorship program is successful accomplish of our college where student-supervisor interaction is a pedestal for stress relieve and stress channelization in a positive direction. This is reflective in result as there was no statistical difference in individual responses along four quartiles in PSS-10 across all academic years (Table 1 & 3). Only 4.8% students had severe stress (fourth quartile of PSS-10), 46.7% students (n=49) had mild stress whereas 37.1% (n=39) had moderate stress. The year wise quartiles distribution had a similar pattern (Figure 1).

**Limitation of study**

Our study have a limitation of small sample size that has a tendency of type 2 error. In our study only male medical students were included. When study was commenced, the College of Medicine, Majmaah, had only three batches with an average of 45 students per year and female Medical College had not started at that time. Moreover, our study was a cross-sectional and information was self-reported by the students, which may have a reporting bias. In addition, the results were from one college and this has the limitation for generalization of findings to other institutes. We do not know the impact of various stressors on high level of all time stress in our medical undergraduate students and relationship of stress with the academic grades. Therefore, another study should be carried out to probe into these issues.

**Conclusions**

The prevalence of stress among medical students at college of medicine, Majmaah University Majmaah is higher than other colleges in Saudi Arabia yet there is no difference in stress level across academic years of study. The high stress-levels should be probed by further studies to ascertain the stressors and relationship with academic grades.

**Conflict of Interest**

There is no conflict of interest for the given study

Table 1: Responses of Students on Perceived Stress Scale

Questions	Never n (%)	Sometimes n (%)	Often n (%)	Quiet Frequently n (%)	Very Frequently n (%)
In the last month, how often have you been upset because of something that happened unexpectedly?	09 (8.60)	32 (30.5)	28 (26.7)	25 (23.8)	11 (10.5)
In the last month, how often have you felt that you were unable to control	26 (24.8)	29 (27.6)	23 (21.9)	20 (29.0)	07 (6.70)

the important things in your life?					
In the last month, how often have you felt nervous and "stressed"?	07 (6.70)	18 (17.1)	30 (26.7)	25 (28.6)	25 (23.8)
In the last month, how often have you felt confident about your ability to handle your personal problems?	24 (22.9)	31 (29.5)	25 (23.8)	20 (19.0)	05 (4.80)
In the last month, how often have you felt that things were going your way?	10 (9.50)	33 (31.4)	32 (30.5)	22 (21.0)	08 (7.60)
In the last month, how often have you found that you could not cope with all the things that you had to do?	14 (13.3)	39 (37.1)	26 (24.8)	19 (18.1)	07 (6.70)
In the last month, how often have you been able to control irritations in your life?	18 (17.1)	30 (28.6)	35 (33.3)	14 (13.3)	08 (7.60)
In the last month, how often have you felt that you were on top of things?	13 (12.4)	26 (24.8)	44 (41.9)	14 (13.3)	08 (7.60)
In the last month, how often have you been angered because of things that were outside of your control?	14 (13.3)	32 (30.5)	18 (17.1)	25 (23.8)	16 (15.2)
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	17 (16.2)	29 (27.6)	23 (21.9)	24 (22.9)	12 (11.4)

Table 2: Comparison of Mean Score – students’ responses on 10 perceived stress score items:

	Year 1 Mean ± S.D n=50	Year 2 Mean ± S.D n=34	Year 3 Mean ± S.D n=21	p-value
Mean Scores	1.82 ± 0.69	1.88 ± 0.64	1.73 ± 0.78	0.728

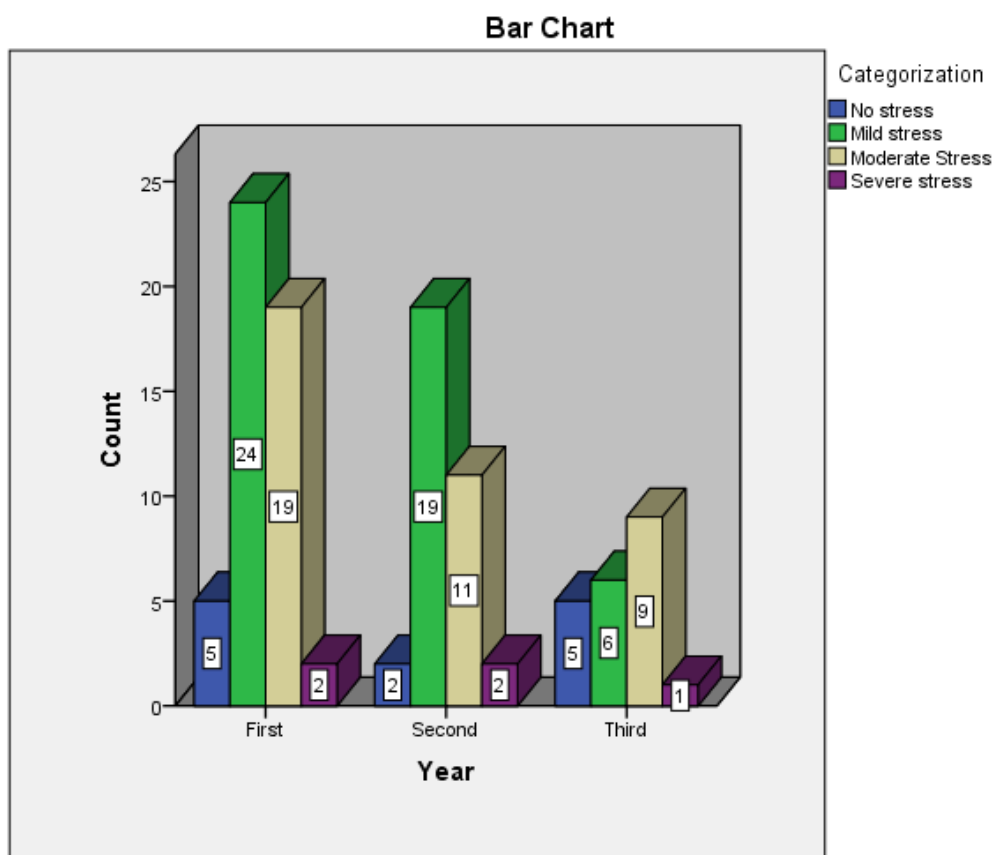
Table 3: Year-wise association of student responses on Perceived Stress Scale

Items	Years			Items	Years		
	1	2	3		1	2	3
	n(%) N = 50	n(%) N = 34	n(%) N = 21		n(%) N = 50	n(%) N = 34	n(%) N = 21
In the last month, how often have you been upset because of something that happened unexpectedly?				In the last month, how often have you found that you could not cope with all the things that you had to do?			
<b>Never</b>	03 (6.00)	02 (5.90)	04 (19.0)	<b>Never</b>			
<b>Sometimes</b>	17 (34.0)	09 (26.5)	06 (28.6)	<b>Sometimes</b>			
<b>Often</b>	12 (24.0)	12 (35.3)	04 (19.0)	<b>Often</b>	08 (16.0)	03 (8.80)	03 (14.3)
<b>Quiet Frequently</b>	14 (28.0)	06 (17.6)	05 (23.8)	<b>Quiet Frequently</b>	09 (38.0)	13 (38.2)	07 (33.3)
<b>Very Frequently</b>	04 (08.0)	05 (14.7)	02 (8.00)	<b>Very Frequently</b>	11 (22.0)	11 (32.4)	04 (19.0)
					08 (16.0)	07 (20.6)	04 (19.0)

					04 (8.00)	00 (0.00)	03 (14.3)
	p-value =0.591				p-value =0.561		
In the last month, how often have you felt that you were unable to control the important things in your life?				In the last month, how often have you been able to control irritations in your life?			
<b>Never</b>				<b>Never</b>			
<b>Sometimes</b>	08 (16.0)	10 (29.4)	08 (38.1)	<b>Sometimes</b>	10 (20.0)	04 (11.8)	04 (19.0)
<b>Often</b>	16 (32.0)	09 (26.5)	04 (19.0)	<b>Often</b>	16 (32.0)	07 (20.6)	07 (33.3)
<b>Quiet Frequently</b>	13 (26.0)	06 (17.6)	04 (19.0)	<b>Quiet Frequently</b>	15 (30.0)	14 (41.2)	06 (28.6)
<b>Very Frequently</b>	09 (18.0)	18 (23.5)	03 (14.3)	<b>Very Frequently</b>	06 (12.0)	07 (20.6)	01 (4.80)
	04 (8.00)	01 (2.90)	02 (9.50)		03 (6.00)	02 (5.90)	03 (14.3)
	p-value =0.564				p-value =0.613		
In the last month, how often have you felt nervous and "stressed"?				In the last month, how often have you felt that you were on top of things?			
<b>Never</b>	02 (4.00)	02 (5.90)	03 (14.3)	<b>Never</b>			
<b>Sometimes</b>	05 (10.0)	09 (26.5)	04 (19.0)	<b>Sometimes</b>	06 (12.0)	01 (2.90)	06 (28.6)
<b>Often</b>	21 (42.0)	06 (17.6)	03 (14.3)	<b>Often</b>	07 (14.0)	13 (38.2)	06 (28.6)
<b>Quiet Frequently</b>	12 (24.0)	07 (20.6)	06 (28.6)	<b>Quiet Frequently</b>	26 (52.0)	12 (35.3)	06 (28.6)
<b>Very Frequently</b>	10 (20.0)	10 (29.4)	05 (23.8)	<b>Very Frequently</b>	06 (12.0)	06 (17.6)	02 (9.50)
					05 (10.0)	02 (5.90)	01 (4.80)
	p-value =0.112				p-value =0.046*		
In the last month, how often have you felt confident about your ability to handle your personal problems?				In the last month, how often have you been angered because of things that were outside of your control?			
<b>Never</b>				<b>Never</b>			
<b>Sometimes</b>	11 (22.0)	05 (14.7)	00 (0.00)	<b>Sometimes</b>	09 (18.0)	03 (8.80)	02 (9.50)
<b>Often</b>	15 (30.0)	11 (32.4)	00 (0.00)	<b>Often</b>	13 (26.0)	14 (41.2)	05 (23.8)
<b>Quiet Frequently</b>	14 (28.0)	08 (23.5)	04 (16.7)	<b>Quiet Frequently</b>	09 (18.0)	06 (17.6)	03 (14.3)
<b>Very Frequently</b>	09 (18.0)	08 (23.5)	14 (58.3)	<b>Very Frequently</b>	12 (24.0)	08 (23.5)	05 (23.8)
	01 (2.00)	02 (5.90)	06 (25.0)		07 (14.0)	03 (8.80)	06 (28.6)
	p-value =0.521				p-value =0.613		

In the last month, how often have you felt that things were going your way?				In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?			
<b>Never</b>				<b>Never</b>			
<b>Sometimes</b>	05 (10.0)	02 (5.90)	03 (14.3)	<b>Sometimes</b>			
<b>Often</b>	07 (34.0)	09 (26.5)	07 (33.3)	<b>Often</b>	08 (16.0)	03 (8.80)	06 (28.6)
<b>Quiet Frequently</b>	15 (30.0)	11 (32.4)	06 (28.6)	<b>Quiet Frequently</b>	13 (26.0)	12 (35.3)	04 (19.0)
<b>Very Frequently</b>	10 (20.0)	09 (26.5)	03 (14.3)	<b>Very Frequently</b>	11 (22.0)	07 (20.6)	05 (23.8)
	03 (6.00)	03 (8.80)	02 (9.50)		13 (26.0)	08 (23.5)	03 (14.3)
					05 (10.0)	04 (11.8)	03 (14.3)
	p-value =0.944				p-value =0.704		

Figure 1.





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