Aboalshamat K, et al., J Community Med Public Health Care 2014, 1: 001
DOI: 10.24966/CMPH-1978/100001

HSOA Journal of Community Medicine and Public Health Care

Research Article

Psychological Health of Medical and Dental Students in Saudi Arabia: A Longitudinal Study

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Abstract

Background: Many studies have indicated the poor psychological health of medical and dental students. However, few studies have assessed the longitudinal trajectory of that psychological health at different times in an academic year.

Aim: To evaluate the positive and negative aspects of psychological health among preclinical medical and dental students in Saudi Arabia.

Methods: A total of 317 preclinical medical and dental students were recruited from second- and third-year students at Umm Al-Qura University in the 2012-2013academic year. The students were assessed at the middle of the first semester and followed up after 3-monthes at the beginning of the second semester. Questionnaires included assessment of depression, anxiety, stress, self-efficacy, and satisfaction with life.

Results: Depression, anxiety, stress, and satisfaction with life were improved significantly at the beginning of the second semester, where as self-efficacy did not change significantly. The medical, female, and third-year student subgroups had the most significant changes. Depression and stress were significantly changed at the beginning of the second semester in most demographic subgroups.

Conclusion: Preclinical medical and dental students have different psychological health levels at different times of the same academic year. Time of assessment should be taken into consideration when comparing the results of such studies.

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Citation: Aboalshamat K, Hou XY, Strodl E (2014) Psychological Health of Medical and Dental Students in Saudi Arabia: A Longitudinal Study. J Community Med Public Health Care 1: 001.

Received: May 20, 2014; **Accepted:** July 29, 2014; **Published:** August 12, 2015

Keywords: Medical students; Dental students; Psychological health; Depression; Stress; Anxiety; Satisfaction; Self-efficacy

Introduction

Multiple systematic reviews have reported unfavorable levels of psychological distress among medical and dental students globally [1-4]. This distress has been suggested to negatively affect the students' health, professional life, and their patients' safety [5,6]. Similarly, other measures of psychological health such as perceived stigma have been associated with students' drop out of medical and dental programs [4,7], which in turn results in a subsequent reduction in the health care workforce.

Many academic factors have been reported to be behind medical and dental students' poor psychological health, such as a high workload, future study concerns, the long duration of academic days, and a high number of examinations [3,4,8,9]. In addition many students who enroll in medical and dental schools may experience performance pressure in order to do well in their studies due to their desire to satisfy the value of helping others, attain prestigious jobs, and achieve a stable financial future [10,11]. This might explain the high level of psychological distress that accompanies the elevated percentage of satisfaction among medical students [12]. An investigation into these students' psychological health should therefore include both the positive and negative aspects of their health in order to achieve more who listicevaluation of psychological health in this population.

The predictors of psychological health in medical and dental students is complex with emerging evidence of moderators of these associations. For example, several studies have highlighted agender difference in psychological distress levels of depression, anxiety, and stress. These studies have indicated that females were more vulnerable to distress than males[3-5,13] however, some studies indicated that there were no differences [14,15]. In addition, year of study has been as a possible moderating factor with the evidence still being contradictory. For example, some have suggested that the early years were more distressing [5] where as others have suggested that distress in the students' last years was greater [4,16]. Moreover, other studies have highlighted that the discipline being studies may be a moderating factor given that dental students are more distressed [17,18] and less satisfied than medical students [19].

Despite the high number of publications since 2000 on the psychological health of medical and dental students, most were cross-sectional studies. Only a few longitudinal studies were conducted to assess the changes across time some found that psychological distress[14,20] and life satisfaction [21] deteriorated from the first years to the final years among medical students. A study in the United Kingdom found that the psychological distress was transient during the first academic year among medical students and did not persist in subsequent years [22]. Few studies have investigated these changes across the same year. A longitudinal study in Malaysia on first-year medical students indicated that they had higher depression, anxiety, and stress levels at final examination time

compared with the beginning of the year [23]. However, such findings were not supported by other literature from other countries investigations of other years or on dental students have not been reported. Furthermore, no longitudinal study has been conducted into the psychological health of medical and dental students in the Middle East.

Thus, the aim of this study was to investigate the psychological health (positive and negative aspects) of Umm Al-Qura University (UQU), Makkah, Saudi Arabia, preclinical medical and dental students at different times. It also aimed to identify changes over time in psychological health between different demographic subgroups.

Materials and Methods

Both medical and dental program at UQU are six-year programs. The students at both faculties study an orientation (1st) year together with other health specialties (such as pharmacy and nursing). After that, medical and dental students study separately for two preclinical (2nd and 3rd) years, followed by three clinical (4th, 5th, and 6th) years. Each year is composed of two semesters. Students at both faculties at UQU take multiple quizzes and examination that start from the 4th-6th week of each semester and continue, with intermittent periods free of exams, until semester's final exams.

Design, sample and ethics

A longitudinal study-design was used on the preclinical students at both faculties for the 2012-2013 academic year at UQU. All male and female students at the preclinical years at both faculties (654) were invited. Only (422) of them accepted to participate, resulting in 64.52% response rate. Of these,(317) completed the follow-up, yielding a 24.88% drop out rate. The 317 students formed the sample size of this study; of these, 81.7% were medical students. Females represented 54.6% and third-year students represented 51.4% of the cohort 66.2% had a family income of more than 10,000 Saudi Riyals (2,667 USD) only 1.9% were non-Saudi; and 2.2% were married (Table 1). The Students' ages ranged between 20 and 22 years. Ethical approval was obtained from Queensland University of Technology, in Australia, and from the medical and dental faculties at UQU in Saudi Arabia.

	Frequency (%)
Faculty	
Medical	259 (81.7)
Dental	58 (18.3)
Gender	
Male	144 (45.4)
Female	173 (54.6)
Studying year	
Second	154 (48.6)
Third	163 (51.4)
Family income	
Low (<10,000 SR)	107 (33.8)
High (>10,000 SR)	210 (66.2)
Marital status	
Single	310 (97.8)
Married	7 (2.2)
Nationality	
Saudi	311 (98.1)
Non-Saudi	6 (1.9)

Table 1: Demographic profile of 317 medical and dental students participating in the study.

SR: Saudi Riyals

Study setting

Data were gathered using a self-reported hard-copy questionnaire that was distributed and collected by research assistants twice: first (T1) at the middle of the first semester after days of minor quizzes, followed up after 3 months (T2) at the first week of the second semester. T2 was after the students spent one-week vacation between the two semesters. Students at T1 or T2 were not taking any exams or quizzes concurrently. The questionnaires were reviewed and analyzed by the main investigator. Participants were asked to sign a study consent form. Participants were informed that they would have another follow-up questionnaire, their data would have no influence on their relationship with their faculties or the research team, and that the data would be treated anonymously.

Instrument

The questionnaire assessed the students' positive and negative psychological health using three scales. The first was the Depression Anxiety Stress Scale (DASS-21) [24] in its Arabic version [25]. DASS-21 is a 21-question scale that is comprised of 7 questions that are summed for each subscale of depression, anxiety and stress.DASS-21hasgood psychometric properties, with reliability coefficients ranging from 0.82 to 0.90 in each subscale [26]. The second was the Satisfaction With Life Scale (SWLS) [27] which measures satisfaction with life; an Arabic version employed in a previous study was used [28]. SWLS is a five-question scale that also has good psychometric properties with a reliability coefficient of 0.87. The third was the General Self-Efficacy scale (GSE) [29] which measures self-efficacy within students; this GSE was used in its Arabic version [30]. GSE is a 10-question scale that has been tested in 25 nations and has good psychometric properties, with a reliability coefficient of 0.86. DASS-21 was used to measure the negative aspects of psychological health, whereas SWLS and GSE were used to assess the positive aspects. Demographic questions were included for department, gender, year of study, family income, marital status, and nationality.

Statistical analysis

Data were analyzed using SPSS software version 21. Frequency tables were generated for the descriptive data. T-test and chi-square test were used to compare between the study participants and the students who dropped out of the study. Paired t-tests were used to analyze the change in depression, anxiety, stress, GSE, and SWLS means betweenT1 and T2. Subgroup analyses involved using paired t-tests to compare changes between T1 and T2 across faculty (medical/dental), gender, year of study, and family income. Only students who completed the questionnaires at T1 and T2 were analyzed. Level of significance was measured as $p< 0.05$ for all tests.

Results

There was no statistical difference in psychological outcomes (using t-tests) and the demographic variables (using chi-square) between the study participants who completed the questionnaires at T1 and T2, and the students who dropped out of the study.

Depression, anxiety, and stress were significantly lower at the beginning of the second semester at T2 than the middle of first

	Score			t (df)	p
	Mean (SD)	Mean difference	95% CI		
Depression					
T1	15.15 (9.06)	2.61	1.68, 3.52	5.56 (316)	<0.001
T2	12.54 (9.35)*				
Anxiety					
T1	12.18 (9.07)	1.54	0.66, 2.40	3.48 (318)	0.001
T2	10.64 (8.82)*				
Stress					
T1	20.72 (8.91)	4.29	3.32, 5.26	8.72 (318)	<0.001
T2	16.43 (9.47)*				
GSE					
T1	27.15 (4.78)	−0.15	−0.53, 0.23	−0.77 (316)	0.442
T2	27.30 (4.45)				
SWLS					
T1	23.37 (6.31)*	−0.85	−1.41, −0.28	−2.95 (316)	0.003
T2	24.22 (6.34)				

Table 2: Depression, anxiety, stress, GSE, and SWLS mean scores atT1 and T2in the preclinical years of UQU medical and dental students.

CI: Confidence Interval; df: degrees of freedom; GSE: General Self-Efficacy scale; p: p value of paired t-test; SD: Standard Deviation; SWLS: Satisfaction With Life Scale; T1: Middle of First Semester; T2: Beginning of the Second Semester

*p<0.05

Factor	Time	Dep. *M(SD)*	Diff.	Anx. *M(SD)*	Diff.	Str. *M(SD)*	Diff.	GSE *M(SD)*	Diff.	SWLS *M(SD)*	Diff.
Faculty											
Medicine (259)	T1	14.98 (9.03)	2.56*	12.22 (9.27)	1.57*	20.8 (8.99)	4.81*	27.17 (4.85)	−0.12	23.2 (6.49)	−0.73*
	T2	12.42 (9.48)		10.64 (8.89)		15.99 (9.68)		27.29 (4.55)		23.93 (6.54)	
Dentistry(58)	T1	15.93 (9.23)	2.83*	12.03 (8.23)	1.38	20.41 (8.66)	2.01	27.12 (4.53)	−0.28	24.16 (5.46)	−1.36*
	T2	13.1 (8.85)		10.66 (8.62)		18.41 (8.3)		27.41 (3.99)		25.52 (5.25)	
Gender											
Male (144)	T1	14.71 (9.05)	2.88*	10.76 (7.99)	0.64	19.36 (9.08)	3.77*	27.59 (4.82)	−0.14	23.49 (5.98)	−0.7
	T2	11.83 (8.68)		10.13 (8.47)		15.59 (8.67)		27.73 (4.29)		24.19 (6.15)	
Female (173)	T1	15.53 (9.08)	2.38*	13.36 (9.75)	2.29*	21.86 (8.65)	4.74*	26.8 (4.74)	−0.16	23.28 (6.6)	−0.97*
	T2	13.15 (9.86)		11.08 (9.12)		17.13 (10.07)		26.96 (4.56)		24.25 (6.53)	
Studying year											
Second (154)	T1	14.01 (8.78)	0.89	11.47 (8.49)	0.68	20.05 (9.04)	3.22*	26.92 (4.67)	0.05	24.66 (5.78)	−0.35
	T2	13.12 (9.62)		10.79 (8.91)		16.84 (9.49)		26.86 (4.52)		25.01 (5.85)	
Third (163)	T1	16.23 (9.22)	4.22*	12.86 (9.57)	2.35*	21.36 (8.78)	5.31*	27.39 (4.89)	−0.34	22.16 (6.57)	−1.32*
	T2	12.01 (9.09)		10.51 (8.77)		16.05 (9.48)		27.73 (4.36)		23.48 (6.72)	
Family income											
Low (107)	T1	15.44 (9.62)	2.76*	13.93 (9.85)	2.76*	21.44 (8.63)	4.09*	26.84 (5.13)	−0.27	23.06 (6.71)	−0.67
	T2	12.68 (10.07)		11.16 (9.29)		17.35 (9.73)		27.11 (4.82)		23.73 (6.89)	
High (210)	T1	15.01 (8.78)	2.53*	11.3 (8.54)	0.91	20.36 (9.06)	4.4*	27.32 (4.6)	−0.09	23.54 (6.12)	−0.94*
	T2	12.48 (8.99)		10.38 (8.59)		15.96 (9.33)		27.41 (4.26)		24.47 (6.06)	

Table 3: Demographic subgroups associated with depression, anxiety, stress, GSE, and SWLS scores atT1 and T2in the preclinical years for UQU students.

M: Mean; SD: Standard Deviation; Anx: Anxiety; Dep: Depression; Diff: Mean Difference; GSE: General Self-Efficacy Scale; Str: Stress; SWLS: Satisfaction with Life Scale; T1: Middle of First Semester; T2: Beginning of the Second Semester

*p<0.05

semester at T1, as shown in Table 2. Satisfaction with life was significantly higher while there was no change in general self-efficacy.

In Table 3, depression, anxiety, and stress were reduced in all demographic subgroups (medical, dental, male, female, second-year, third-year, and high and low family income students). Depression was reduced significantly among all the subgroups shown in Table 3 except the second-year students. Stress was also reduced significantly among all the subgroups shown in Table 3 except for dental students. Anxiety level reduction was significant only among the medical, female, third-year, and low family income students. General self-efficacy

showed no significant change occurred in any subgroups (Table 3). All the demographic subgroups showed increased satisfaction with means at T2 however, the largest increase was found in the medical, dental, female, third-year, and high family income students.

Discussion

Depression, anxiety, and stress status were significantly lower at T2 for the students overall, indicating an improvement in the negative aspect of psychological health. This also indicates that students at the middle of years taking classes, exams, and quizzes might manifest a higher distress in compared to beginning of a new semester after having one-week vacation. It also agrees with a previous study on first-year medical students in Malaysia that finds that depression, anxiety, and stress at the beginning of a semester are lower than during or at the end of a semester [23]. In addition to a reduction in negative effect, the students also experienced an increase in satisfaction with life at the start of the second semester supporting the view that mid-semester vacations are important in rejuvenating university students. This appears to contradict with Kjeldstadli and colleagues' study, which indicated a deterioration of satisfaction prospectively across different years for medical students [21]. However, this disagreement might be because their study assessed satisfaction across different years, whereas our study assessed the difference within different time points of the same year.

On the other hand, general self-efficacy did not change significantly between T1 and T2, and neither was any demographic subgroup associated with significant changes in GSE level. This seems to disagree with a previous study that found a reduction in self-efficacy among dental students over the subsequent academic years [13]. However, again, our study was evaluating self-efficacy level across the same year, whereas the Polychronopoulou study assessed self-efficacy across different years. It is therefore possibly the insignificance of our results might be because the short time between the T1 and T2 (3 months) did not provide enough academic experience or time in the course unit to elevate GSE level. It is noteworthy that general self-efficacy was not sensitive to change in this population.

The general improvement in our results in psychological health (depression, anxiety, stress, and satisfaction) constructs suggests that the medical and dental students experience different educational environment along the semesters. The multiple examinations in the middle of the semester is suggested to be an important distressful factor. Our results also suggest that the student are rejuvenated by vacation breaks between semesters and emphasizes the importance of such breaks in promoting the psychological health of medical and dental students.

More specifically the findings of the study also suggest that there were significant differences in psychological health among the demographic subgroups such as department, gender, year of study, and family income. Neither nationality nor marital status were included in the statistics because of the low number of non-Saudi (6) and married students (7).We identified four patterns in changes in psychological health based on changes in depression, anxiety, stress and satisfaction for life. First, medical, third year, and female subgroups had larger improvements in depression, anxiety, stress, and satisfaction with life between T1 and T2 than dental, 2nd year and male subgroups.

Second, several significant results found in medical students were not significant in dental students (e.g. anxiety and stress scores) despite direction of means being consistent across groups. It is likely this is due to differences in sample size of the two groups perhaps rather than anything intrinsic to the groups themselves. However, the presence of persistent anxiety levels among dental students has another potential explanation as UQU Dental Faculty is newly established, meaning there is continuous reform in the curriculum and academic environment that could potentially increase students' anxiety about unknown challenges. Also, Silverstein indicates in her longitudinal study that stress level changes differently among different dental schools [31] which could be another suggested explanation to our finding in terms of stress.

Third, we noticed that second-year students' psychological health did not improve except in terms of stress levels, while third year students' psychological health improved in terms of depression, anxiety, stress, and life satisfaction. This might indicate that third-year students suffer from more challenges and distress, as indicated in another study [32] and brief vacations is more beneficial for third year students than second year. The significant reduction in stress level in both years can be justified as quizzes and examinations, which might increase students stress especially, are more frequents in the middle of semesters than the beginning.

Last, depression and stress level were reduced at all the demographic subclasses, unlike anxiety and SWLS. Anxiety and SWLS seem to be sensitive to gender, year of study, and family income. Male and second-year students had no improvement in anxiety or satisfaction levels at T2. In regard to income, low family income students had a significant reduction in anxiety in contrast with high-income students. This might be due to financial burden of expenses during the semester. On the other hand, high family income students had a significant increase in SWLS, unlike low family income students. This is may be because high family income students can spend extra money to enjoy their time at the beginning of the year in contrast to low-income students.

This study had the following strengths. The prospective study design gave more details about the psychological health among preclinical medical and dental students across the same academic year. Also, there were very few missing data, and the dropout percentage was justifiable in such a study design. Also, there was no demographical or psychological difference between our sample and dropped out students. The instruments used in this study had good psychometric properties and have been widely used in different cultures; this will facilitate comparisons with future studies. Finally, the study evaluated both dental and medical students.

On the other hand, caution needs to be taken in generalizing the results of this study to all preclinical medical and dental students in Saudi Arabia because the study was conducted in only one university in Saudi Arabia. The sampling method was based on self-selection and so was not random-based, which might result in participation bias. Further studies assessing these measures at multiple times across their second and third years or across the clinical years would provide more comprehensive information about the progression of psychological health of medical and dental students throughout their course.

Our results indicated that psychological health of dental and medical students in Saudi Arabia may change during the academic year with psychological health being better at the beginning of a semester than during the middle of a semester. This drew an implication on the majority of the cross sectional studies on psychological health among medical and dental students, as the

differences in the cross-sectional results might be because of different data collection time. Our findings also indicate that the middle of the semester is a good time for medical and dental faculties to conduct coaching programs [28] to help students and vulnerable groups cope with stress. It is essential that medical and dental faculties identify and provide possible support for students facing deteriorating psychological health, especially when only a few will seek help in such specialties [33].

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