



# Prevalence of Anxiety among Paramedic Students in Saudi Arabia

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## Abstract

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**BACKGROUND:** Anxiety disorders are among the most common psychiatric illnesses, resulting in considerable functional impairment and distress. The stressful nature and complex work demands of studying and practicing paramedics make them more prone to psychiatric illnesses, one of which is anxiety.

**AIM:** This study aims to determine the prevalence of anxiety among paramedic students in Saudi Arabia.

**METHODS:** A cross-sectional study was conducted among paramedic students in the 3<sup>rd</sup> and 4<sup>th</sup> year of the Emergency Medical Services of the College of Applied Medical Sciences at all King Saud bin Abdulaziz University for Health Science branches in Jeddah, Riyadh, and Al-Ahsa'a, Saudi Arabia. We obtained the data from our sample size during May 2020. The study utilized the General Anxiety Disorder-7 (GAD-7) test to screen for anxiety and assess its severity in paramedic students.

**RESULTS:** There were 181 participants, of which 133 (73.5%) were male students. Most participants reported being unmarried, 99.4%. Regarding the GAD-7 test, 32.6% had no anxiety, whereas the most had mild anxiety, 43.1%, and 14.9% had moderate anxiety, with the fewest, 9.4% having severe anxiety.

**CONCLUSION:** Significant anxiety level was reported among the students, and most showed excessive worrying and nervousness, which affected them academically and occupationally. More research is required to assess the prevalence of anxiety among paramedic practitioners. Addressing the impact of anxiety on students at an earlier stage can improve their academic and work performance.

## Introduction

Anxiety is a normal stress reaction and can be beneficial in some situations as it can alert us to dangers and help us prepare and pay attention. Symptoms of anxiety disorders are the same as those of a normal anxiety response [1]. Anxiety has been implicated in several chronic physical illnesses, including heart disease, chronic respiratory disorders, and gastrointestinal conditions. When left untreated, the disease is more challenging to treat [2]. Regarding the etiology of anxiety, it is speculated that it occurs due to alterations in the structure and function of the amygdala, which are central to fear-related behavior [3].

Moreover, it can occur due to heightened cortical activity, and decreased basal ganglia activity, as the prefrontal cortex, and temporal lobe control fear and anxiety [3]. An additional factor is a genetic component, which is essential in predisposing to all anxiety disorders [1]. History of stressful or traumatic experiences can predispose to anxiety disorders [3], [4].

Anxiety is the most prevalent psychiatric illness in the general community and accounts for 15–20% of medical clinic patients [5]. Approximately 8% of children and teenagers experience an anxiety disorder, with most developing symptoms before the age of 21 years [6]. According to the World Health Organization (WHO) 2017 booklet of Global Health Estimates, the total estimated number of people living with anxiety disorders in the world was 264 million, which is a 14.9% increase since 2005 [7]. Furthermore, the percentage of anxiety in the Eastern Mediterranean Region, which the Gulf countries are a part of, is 12% or 31.36 million [7]. In 2017, the WHO reported that the prevalence of anxiety was 4.3% of the total population, in the Kingdom of Saudi Arabia [7].

Some studies assess the level of anxiety in paramedic practitioners worldwide, but very few studies are conducted in Saudi Arabia. Therefore, we are conducting this research to assess the prevalence of anxiety among paramedic students and address the factors leading to their anxiety. In addition, we are comparing the results with other studies published worldwide.

## Methods

This cross-sectional study was conducted at King Saud bin Abdulaziz University for Health Sciences, a university focused on health sciences such as medicine, nursing, pharmacy, and many more, including paramedics. It has three branches in the main cities of Saudi Arabia, Riyadh, Jeddah, and Al-Ahsa'a. We surveyed at the Emergency Medical Services of the College of Applied Medical Science at all three branches. We included students from the 3<sup>rd</sup> and 4<sup>th</sup> years. However, students from years 1 and 2 were excluded as they were considered in their prior years. We collected the data in May 2020 by distributing the questionnaire among all paramedic students at the three branches. The sample size was calculated using the Raosoft website. Out of 232 paramedic students, 181 participated. We calculated the minimum required sample size, which is 145 students, taking into account a 10% non-response rate.

General Anxiety Disorder-7 (GAD-7) test and Demographic profile included a few personal questions (gender, academic grade, marital status, and presence of chronic diseases). The test has scores of 0, 1, 2, and 3 in the response categories of "not at all," "several days," "more than half the days," and "nearly every day," respectively. The total score for the seven items ranges from 0 to 21. Scores 5, 10, and 15 represent cut points for mild, moderate, and severe anxiety, respectively. The test is primarily used as a screening and severity measure for generalized anxiety disorder. When screening for an individual or any anxiety disorder, a recommended cut-point for further evaluation is a score of 10 or greater with a sensitivity of 89% and a specificity of 82% for GAD [8].

Data were analyzed using the Statistical Package for the Social Sciences V.20. Categorical variables were calculated and reported as frequencies and percentages, whereas quantitative variables were means and standard deviations. Categorical variables were tested by the Chi-square test. The significance level (p-value) is set to  $\leq 0.05$ . This study has been approved by King Abdullah International Medical Research Center ethical committee. We kept the identities of the students confidential, and the data that have been collected remains confidential and protected from any access by third parties.

## Results

Among 232 paramedic students enrolled at all King Saud bin Abdulaziz University for Health Science branches, 181 (78%) completed the questionnaire. The response rate was 133 (79.2%) for male students and 48 (75%) for female students. For the academic year, the response rate was 73.2% for the 3<sup>rd</sup> year and 82.5% for the

**Table 1: Response rate**

Characteristics	Total KSAU-HS students, n (%)	Total participants, n (%)	Response (%)
Gender			
Male	168 (72.4)	133 (73.5)	79.2
Female	64 (27.6)	48 (26.5)	75.0
Academic year			
Third	112 (48.3)	82 (45.3)	73.2
Fourth	120 (51.7)	99 (54.7)	82.5

KSAU-HS: King Saud bin Abdulaziz University for Health Science.

4<sup>th</sup> year (Table 1). The majority of participants, 168 (92.8%), did not report any chronic disease, whereas 13 (7.2%) had one disease, and Asthma was the most reported chronic disease, 76.9% at ten responses (Table 2).

**Table 2: Demographics**

Characteristics	n (%)
Gender	
Male	133 (73.5)
Female	48 (26.5)
Academic year	
Third-year	82 (45.3)
Fourth-year	99 (54.7)
Marital status	
Unmarried	180 (99.4)
Married	1 (0.6)
Chronic disease	
No	168 (92.8)
Yes	13 (7.2)
Total	181 (100)
If yes, please state it	
Asthma	10 (76.9)
Migraine	1 (7.7)
IBS	1 (7.7)
Eczema	1 (7.7)
Total	13 (100)

The second part was the GAD-7 test, at which 59 students, 32.6%, had no anxiety. In contrast, most had mild anxiety, 78 (43.1%), and 27 (14.9%) had moderate anxiety, and the fewest number of students, 17 (9.4%), had severe anxiety. Sixty-seven per cent had some level of anxiety, and 24.3% had moderate-to-severe anxiety.

**Table 3: General anxiety disorder-7 students' responses**

Symptoms	n (%)
Feeling nervous, anxious, or on edge	
Not at all	46 (25.4)
Several days	95 (52.5)
More than half days	26 (14.4)
Nearly every day	14 (7.7)
Not being able to stop or control worrying	
Not at all	61 (33.7)
Several days	74 (40.9)
More than half days	30 (16.6)
Nearly every day	16 (8.8)
Worrying too much about different things	
Not at all	36 (19.9)
Several days	84 (46.4)
More than half days	33 (18.2)
Nearly every day	28 (15.5)
Trouble relaxing	
Not at all	71 (39.2)
Several days	77 (42.5)
More than half days	20 (11.0)
Nearly every day	13 (7.2)
Being so restless that it is hard to sit still	
Not at all	96 (53.0)
Several days	60 (33.1)
More than half days	18 (9.9)
Nearly every day	7 (3.9)
Becoming easily annoyed or irritable	
Not at all	63 (34.8)
Several days	69 (38.1)
More than half days	19 (10.5)
Nearly every day	30 (16.6)
Feeling afraid as if something awful might happen	
Not at all	70 (38.7)
Several days	58 (32.0)
More than half days	29 (16.0)
Nearly every day	24 (13.3)
Severity	
None	59 (32.6)
Mild	78 (43.1)
Moderate	27 (14.9)
Severe	17 (9.4)
Total	181 (100)

**Table 4: Association between severity of anxiety and gender**

Severity of anxiety	Gender		Total	p
	Male, n (%)	Female, n (%)		
None	48 (36.1)	11 (22.9)	59	0.093
Mild	57 (42.9)	21 (43.8)	78	
Moderate	15 (11.3)	12 (25.0)	27	
Severe	13 (9.8)	4 (8.3)	17	
Total	133	48	181	

Chi-square test.

Finally, when looking at the answers themselves, most of the participants 145 (80.1%) reported "Worrying too much" for at least "Several days" or more, followed up by the answer "Feeling nervous, anxious, or on edge," and 135 (74.6%) agreed to it (Table 3).

Associating the severity of anxiety with gender and comparing male and female students, of 85 male students, 63.9% had some level of anxiety, and with 28 students, 21.1% had moderate-to-severe anxiety. Regarding female students, 77.1% had some level of anxiety, and 16 (33.3%) had moderate-to-severe anxiety. The Chi-square test showed that there was no significant association between the severity of anxiety regarding gender ( $p = 0.093$ ) (Table 4). Associating the severity of anxiety with the academic year and comparing the 3<sup>rd</sup> and 4<sup>th</sup> years, it was shown that almost 60 (73.1%) of the students in the 3<sup>rd</sup> year, compared to 62 (62.7%) of the student in the 4<sup>th</sup> year, had some level of anxiety. Furthermore, 27 (32.9%) and 17 (17.2%) had moderate-to-severe anxiety in the 3<sup>rd</sup> and 4<sup>th</sup> years, respectively. The Chi-square test showed that there was no significant association between severity of anxiety regarding academic year ( $p = 0.091$ ) (Table 5).

Finally, we found that the 3<sup>rd</sup>-year female students had the highest percentage of anxiety (82.2%), followed by the 4<sup>th</sup>-year female students (70%), then the 3<sup>rd</sup>-year male students (68.5%), and finally, the 4<sup>th</sup>-year male students (60.8%). The Chi-square test showed a significant association between severity of anxiety with male gender regarding academic year ( $p = 0.011$ ), whereas there was no significant association regarding female gender ( $p = 0.225$ ) (Table 6).

**Table 5: Association between severity of anxiety and academic year**

Severity of anxiety	Academic year		Total	p
	Third year, n (%)	Fourth year, n (%)		
None	22 (26.8)	37 (37.4)	59	0.091
Mild	33 (40.2)	45 (45.5)	78	
Moderate	17 (20.7)	10 (10.1)	27	
Severe	10 (12.2)	7 (7.1)	17	
Total	82	99	181	

Chi-square test.

## Discussion

As members of emergency medical health care, paramedics often encounter stressful situations during work that can cause psychiatric disturbances [9]. In 2018, studies published concerning stress among health-care professionals found that 59% had moderate

**Table 6: Association between severity of anxiety with gender and academic year**

Severity of anxiety	Academic year		Total	p
	Third year, n (%)	Fourth year, n (%)		
<b>Male</b>				
None	17 (31.5)	31 (39.2)	48 (36.1)	0.011
Mild	18 (33.3)	39 (49.4)	57 (42.9)	
Moderate	10 (18.5)	5 (6.3)	15 (11.3)	
Severe	9 (16.7)	4 (5.1)	13 (9.8)	
Total	54	79	133	
<b>Female</b>				
None	5 (17.9)	6 (30.0)	11 (22.9)	0.255
Mild	15 (53.6)	6 (30.0)	21 (43.8)	
Moderate	7 (25.0)	5 (25.0)	12 (25.0)	
Severe	1 (3.6)	3 (15.0)	4 (8.3)	
Total	28	20	48	

Chi-square test

stress [9]. Paramedic students have a stressful way of life. In addition, the high demand for studying and working make them prone to prolonged stress that might lead to pathological anxiety.

Our study's response rate was almost equal for male and female students, 79.2% and 75%, respectively. However, the overall level of anxiety among females, 77.1% was higher than males 63.9%, and one-third of female students 33.3% had moderate-to-severe anxiety versus 21.1% of male students, the cause of that difference could not be identified as the academic curriculum was identical for both. According to the National Institute of Mental Health, the prevalence of any anxiety disorder was higher for females, 23.4%, than for males, 14.3% [10]. This study revealed a higher increase in anxiety among female paramedic students in the 3<sup>rd</sup> and 4<sup>th</sup> year of study than among male students in the same respective years, 82.2% and 70% versus 68.5% and 60.8%. Furthermore, the overall level of anxiety in the 3<sup>rd</sup> year was higher than that in the 4<sup>th</sup> year, 73.1% versus 62.7%, respectively. Moreover, students with moderate-to-severe anxiety in the 3<sup>rd</sup> year compared to those in the 4<sup>th</sup> year were two-fold, 32.9% versus 17.2%. This difference could be due to students in the 3<sup>rd</sup> year just beginning their paramedic studies and having less experience than 4<sup>th</sup>-year students.

A previous study was conducted in the United States among nationally certified emergency medical services (EMS) professionals and included The Depression, Anxiety, and Stress Scale - 21 Items. The results showed that 6% of those with worsened health, females, and unmarried individuals had anxiety. It also showed that 5.9% were stressed, and paramedics were more likely to be depressed, anxious, and stressed due to their job responsibilities [11]. A different study on the prevalence of post-traumatic stress disorder (PTSD) and common mental disorders among ambulance personnel reported that the prevalence of anxiety was 15%, general psychological distress was 27%, and PTSD was 11% [11]. Another study used the Westside Test Anxiety Scale to measure anxiety and showed that 70% of the participants reported moderate-to-severe anxiety, and 87% reported that they became anxious when facing an upcoming summative assessment. Therefore, it was concluded that there were high levels of anxiety among the students [12].

In Riyadh, Saudi Arabia, a study was conducted among paramedics at Saudi Red Crescent Authority and reported that the prevalence of anxiety was high (40%), compared to stress and depression of 30.5% and 26.7%, respectively. In terms of severity, it was reported that severe to extremely severe anxiety 5.1% in paramedics was higher than other psychiatric disorders among paramedics, such as depression 1.3%. This might be attributed to a high number of mission calls which means higher exposure to patients, use of stimulant beverages, such as tea, coffee, and energy drinks, and the number of sleep hours/day, considered predictors of anxiety [13]. Another study in the United States reported that the prevalence of anxiety among paramedics was 6% [13]. In addition, a study in Riyadh showed that 44.4% of paramedics had mild-to-moderate levels of anxiety, and 7.6% had severe anxiety. In addition, the study revealed that paramedics had higher anxiety levels than physicians and nurses [14].

Research published in 2019 found that female gender and increasing work years are the most factors associated with paramedics' inactivity and work stress [15]. In addition, Wills and Asbury [16] conducted a study to assess the prevalence of anxiety among paramedic students in New Zealand and reported that students with previous tertiary education to diploma had a significantly higher anxiety level ( $36.72 \pm 5.92$ ) than those with prior degree education ( $31.42 \pm 7.58$ ), ( $p = 0.02$ ). The authors concluded that paramedic students' anxiety might be impacted by difficult and demanding practice, facing dangerous and traumatic circumstances and student backgrounds. Furthermore, inadequate income is linked with work pressure while studying, which is considered a source of anxiety [15].

### Limitations

The current study used a single unidimensional survey that put it at risk of bias. Furthermore, it is not feasible to identify the causes of stress and anxiety among the students and the cause of higher percentages of anxiety among some groups over the others, only suggesting plus predicting the causes and the differences that were present.

### Conclusion

Significant levels of anxiety were reported among the students, and most of them showed excessive levels of worrying and nervousness, which affected them academically and occupationally. More research is required to assess the prevalence of anxiety among paramedic practitioners, as addressing the problem at an earlier stage will positively affect the students who will become practitioners in future.

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