

The impact of the First Year of Medical School on Anthropometric Measurements



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INTRODUCTION

First-year medical students are placed under significant stress upon starting their education. Stress is essentially a threat to the body's homeostatic state and the ANS properly responds to acute stress¹ Both acute and chronic stress exist, where acute stress is a short-term and adaptive state whereas chronic stress will be maladaptive with harmful effects on the body mechanisms.² To respond to threats and challenges, individuals are equipped with stress systems that communicate the need to adapt or survive.³ Chronic stress can lead to increases in blood pressure, BMI, resting heart rate, respiration rate, and pulse oximetry.² For first-year medical students; exams, a new life situation, and personal problems are all stressful experiences that can negatively impact their health.⁴

OBJECTIVE

The purpose of this study was to track first-year medical students' BMI, blood pressure, heart rate, respiratory rate, and pulse oximetry over the first semester of medical school.

METHODS

Medical students were solicited to participate. At the beginning of the semester data collection, participants were asked to complete an online survey for demographic information, and then their blood pressure, heart rate, pulse oximetry, respiratory rate, height in cm, and weight in kg were collected. At the end of the semester, participants returned to have their anthropometric measurements retaken. BMI was calculated using height and weight. Data were uploaded into SPSS for analysis. Means, standard deviations, and frequencies were calculated for variables. Paired samples t-tests were conducted to determine differences over the course of the semester. T-tests were also used to determine differences in variables at each individual data collection point for parametric data and Mann-Whitney analyses were run on non-parametric data.

RESULTS

A convenience sample of 28 medical students (male = 16, female = 12, age = 24.86 ± 4.16) participated in the study. BMI and weight increased over the course of a semester for all participants. T-tests analyzing differences in variables at the initial data collection demonstrated differences in sex assigned at birth and systolic blood pressure (t=2.39, P=0.02), gender identity and systolic blood pressure (t=2.39, p=0.02), and children in the house and BMI (t= -2.10, p<0.05). This demonstrated that males (both sex assigned at birth and gender identity) had higher levels of systolic blood pressure while those individuals who had children living in the house had a higher BMI. Additionally, within the first data collection, a statistical difference was determined by a Mann Whitney between Being Affiliated with a Native Tribe and diastolic blood pressure (Z= -2.26, p=0.02), with non-natives having higher diastolic blood pressure. T-tests for the second data collection demonstrated differences between children in the house and BMI (t=-2.12, P=0.04) and children in the house systolic blood pressure (t= -2.41, p=0.02), demonstrating those with children had higher values.

Variable	Mean	Std Deviation	t value	p value
Weight Pre	75.17	14.49	-2.36	0.03
Weight Post	76.48	15.54		
BMI Pre	25.42	3.87	-2.36	0.03
BMI Post	25.85	4.18		
Pulse Oximetry Pre	98	1.02	1.31	0.2
Pulse Oximetry Post	97.54	1.86		
Resting Heart Rate Pre	71.25	13.15	1.04	0.31
Resting Heart Rate Post	68.64	11.01		
Resting Respiration Rate Pre	15.36	1.81	0	1
Resting Respiration Rate Post	15.36	1.55		
Systolic Blood Pressure Pre	124.82	5	1.22	0.23
Systolic Blood Pressure Post	123.43	5.98		
Diastolic Blood Pressure Pre	73.96	5.5	-0.87	0.4
Diastolic Blood Pressure Post	75.5	8.79		

CONCLUSION

Attending medical school may have negative impacts on students. Specifically, long-term exposure to psychosocial stress may lead to adverse long-term health outcomes.³ This study demonstrated that the overall rigor and lifestyle of a medical student along with outside factors can negatively impact one's health in terms of weight, BMI, and blood pressure. Studies that shown that in addition to chronic stress, medical students have suboptimal physical activity.⁵ In prior studies it was found that “physical, emotional, and overall health are highest at baseline, and reach their lowest point at the end of Year 1”⁶ Schools are encouraged to offer resources such as an on sight gym, fitness classes, counseling, nutrition classes, mental health resources, and support for habits outside of medical school to assist in mitigating the stress and associated challenges of medical school.

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