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# Promoting mental wellness and reducing stress among physician assistant students

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BOSTON UNIVERSITY

ARAM V. CHOBANIAN & EDWARD AVEDISIAN SCHOOL OF MEDICINE

Thesis

**PROMOTING MENTAL WELLNESS AND REDUCING STRESS AMONG  
PHYSICIAN ASSISTANT STUDENTS**

by

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**ABSTRACT**

Physician assistant (PA) programs are graduate medical programs, where the training is academically rigorous, placing students in a vulnerable position for increased psychological stress and poor mental wellness. As the role of a PA is relatively new in the field of medicine, less research has been performed on ameliorating these risks in PA student education compared to medical students. In the pursuit of an accelerated educational experience, PA programs place a variety of stressors on students, which can exacerbate underlying mental issues. As PA students are future health care professionals and advanced practice providers (APP), it is important to recognize these stressors, as well as implement practices focused on stress reduction.

PA program faculty can reduce psychological stress and improve mental wellness during the training period. If programs were to provide increased attendance flexibility, it may allow students time to focus on juggling mental health during acutely stressful situations improving mental wellness. The implementation of attendance flexibility would benefit students and faculty alike, as this change would decrease the burden of work overseeing student compliance, while and decreasing PA student burnout.

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## LIST OF ABBREVIATIONS

AAPA.....	American Academy of Physician Associate
APP .....	Advanced Practice Provider
ARC-PA.....	Accreditation Review Commission on Education for the Physician Assistant
CASPA.....	Central Application Service for Physician Assistants
DO.....	Doctor of Osteopathic Medicine
IRB.....	Institutional Review Board
MD .....	Medical Doctor
PA .....	Physician Assistant/Physician Associate
PA-C .....	Certified Physician Assistant
PAEA .....	Physician Assistant Education Association
PANCE .....	Physician Assistant National Certifying Exam
US .....	United States

## INTRODUCTION

### Background

A physician assistant is an advanced practice provider who works collaboratively with a physician or works under the supervision of a physician, depending on the state. PAs operate as qualified healthcare providers, obtaining histories, performing physical exams, ordering diagnostic testing, prescribing medications, performing procedures, assisting in surgeries, as well as developing treatment plans.<sup>1</sup> To become a certified PA (PA-C), one must attend an accredited physician assistant training program granting at minimum a master's degree, as well as pass Physician Assistant National Certifying Exam (PANCE). PA programs are an average of 27 months, three academic years, which consist of an academic didactic learning phase and a clinical rotation phase.<sup>2</sup>

Stress is a known impactor of mental health. Long term stress has been shown to correlate with declining mental wellness. With the increase in psychological stressors of PA school, students can suffer from a multitude of issues from poor academic performance to personal dissatisfaction. Students can become burnt out and lose interest in their future career as a healthcare provider.<sup>3</sup> With multiple responsibilities, several priorities in their life may falter, whether it is grades, social life, or self-care.

PA schools present students with academic, economic, and physical stressors. The cumulative effect of these stressors is poor mental wellness. Mental health changes have been extensively studied in medical schools around the world but, with a difference in

expectations and timeline, research for medical schools is not fully applicable to physician assistant schools.

General to all healthcare professional programs, some stressors that PA students face are unlikely to change. One consistent stressor is the financial burden to attend but there are other stressors, which are more easily remedied with administrative changes in the training. This report investigates what is known about the issue and presents a potential solution to the issue of mental wellness in PA medical education through implementation of flexible attendance. With an Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) standard for all PA programs requiring curriculum with student mental wellness in mind, this report offers a change in perspective on the solution to the problem.<sup>4</sup>

### **Statement of the Problem**

Stressors and the related poor mental wellness are ubiquitous among students in PA school.<sup>5</sup> The shift from undergraduate course work to PA school can be a difficult adjustment. In many cases, it is the most challenging course load students have had. The rigor of graduate medical education and the number of unpaid hours at clinical rotations challenge students physically, mentally, and emotionally. The expectations of PA programs make it difficult for students to focus on maintaining their mental health through use of therapy, hobbies, or exercise.<sup>6</sup>

A fixed and large stressor of PA school is educational cost. The amount of money required to attend a graduate medical program forces most students to sign loans of up to

\$100,000 to \$200,000, in the case of private universities. The long hours during didactic and clinical phases do not present an opportunity to work, as well as most institutions prohibiting employment during the length of the program.<sup>7</sup> Without the opportunity to work, students take additional loans for living expenses. The financial burden and distance from support systems makes students mentally and emotionally vulnerable in school. Financial cost and time availability make it difficult to visit family, significant others, and friends. Important life events, like birthdays, weddings, and social gatherings, may be missed. While some PA students have families or other support systems to help with financial contribution, these support systems do not apply to all.

Poor mental wellness and stress have negative effects on academic performance. Increased stress can make it hard to focus on academics. Decreased focus can lead to lower exam scores fostering self-doubt, resulting in difficulty studying for the next exam. This doubt and stress lead to poor academic performance that further impacts mental wellness.<sup>8</sup> This cycle leads to students feeling dejected, due to their poor academic performance, and socially isolated from their better-performing peers. In some instances, this leads to a leave of absence reflected in attrition rates. The attrition rates are required to be posted publicly for future prospective students and are part of program accreditation for all PA programs.<sup>9</sup>

Medical schools in the US, have existed since 1765 resulting in a greater body of research that has followed the evolving nature of medical school education and the various stressing factors that affect medical students' mental health.<sup>10</sup> PA schools have existed for less than 60 years with fewer studies focused on student stressors. PA

programs have evolved to be similar to medical school education through increased degree requirements and breadth of knowledge taught. PA education 50 years ago did not result in an academic degree and competency and proficiency for graduation was school-specific. Throughout the 60 years, PA programs transitioned from an associate's degree to a bachelor's degree and, now, currently requires a master's degree.<sup>11</sup> While modern day PA school and medical school are similar, there are differences in expectations of students including attendance/professional accountability and length of school breaks.

Professionalism development is commonplace in health profession schools. Professionalism in medicine helps foster trust between patients and providers of medical care. In many health professional schools, professionalism is developed through simulated patient interactions and academic behavioral requirements during the program, such as compulsory attendance.<sup>12</sup> Behavioral expectations are different between medical fields with lecture attendance optional at over 50% of medical schools in the nation, slowly increasing throughout the years,<sup>13</sup> compared to mandatory attendance at over 95% of PA schools in the nation.<sup>14</sup> These differences in medical education between health professions should be researched more in-depth to determine any their effects on mental health with a goal to provide every PA student a chance at balancing mental health and self-care with academic performance and professionalism. Mandatory attendance in PA school presents deficiencies in medical education that exist for PA students around the nation from a decreased focus on mental wellness and stress reduction.<sup>15</sup> Attendance modifications are an easily implemented intervention that PA programs can undertake to decrease psychological stressors in students' lives by allowing students to potentially

spend time addressing other acute psychological stressors throughout the year. The mental health interventions researched and implemented on medical students should be considered for PA students to prevent burnout and encourage mental wellness in their pursuit of a career in medicine.

### **Hypothesis**

If PA schools implement five flexible attendance days per year, then PA students will report improved mental wellness and lower levels of psychological stress compared to PA students who had no flexibility in attendance and mandatory attendance all days of the year. These five flexible attendance days would be allocated for mental health. The days would be student-chosen and could be used at any time with no expectations of notifying multiple faculty members immediately preceding classes in times of acute stress or for any other reason chosen by the student without stating a reason.

### **Objectives and specific aims**

The objective of this study is to interpret the effectiveness of implementing five flexible attendance days on overall stress and mental wellness of physician assistant students.

This proposed experiment focuses on the implications of possible reduced professional accountability through a fixed number of flexible attendance days. The control group will not have five flexible attendance days. The experimental group will have five flexible

attendance days. For both groups, there will be three surveys administered, one prior to beginning the program, one at six months, and one at 12 months to assess PA students' subjective psychological stress level and self-perceived mental wellness. The surveys will feature closed form questions for simplicity and statistical analysis, investigating students' perception on the presence and amount of certain psychological stressors and related mental wellness. The survey results will be self-reported. The specific aims include:

1. Physician assistant students with five flexible attendance days per year will self-report lower levels of psychological stress than the control group.
2. Physician assistant students with five flexible attendance days per year will self-report higher mental wellness than the control group.

## REVIEW OF THE LITERATURE

### Overview

A physician assistant (PA) is an advanced practice provider who works under the supervision of a physician or has a collaborating agreement with a physician, depending on the state. The physician can be a medical doctor (MD) or a doctor of osteopathic medicine (DO). PAs operate as qualified healthcare providers, obtaining histories, performing physical exams, ordering diagnostic testing, prescribing medications, performing procedures, assisting in surgeries, and developing treatment plans. PAs work in a variety of fields and settings, from inpatient emergency medicine to outpatient plastic surgery. The job expectations of PAs are similar to the physicians that oversee their care. The PA position originated in the US in 1967 at Duke University and, since then, has spread across the country, with 168,300 PAs working in all 50 states.<sup>16</sup> PAs are a crucial part of the healthcare team, helping fulfill a shortage of physicians that has existed for years.<sup>17</sup>

There are many parts to becoming a certified and practicing physician assistant. Application and matriculation to PA school is managed by the Centralized Application Service for Physician Assistants (CASPA), a system for coordinating applications to PA schools around the United States.<sup>18</sup> There are two pathways for prospective students to apply to PA school. Students in the traditional pathway apply after obtaining a bachelor's degree in any major with the required prerequisites. Students in the accelerated pathway apply to a direct entry PA program in the last year of high school and complete an

accelerated bachelor's and master's program in five to six years. The accelerated pathway reduces the time it takes to become a practicing PA. For both pathways, there are prerequisites that must be completed before the application process can begin.

Patient care experience is a common PA program prerequisite. Many PA programs require prospective students have patient care experience, defined as being involved in the care and treatment of patients in a healthcare setting. Matriculated PA students have an average number of 2500 patient care hours, approximately a year and a half of full-time work.<sup>19</sup> Most PA programs require a year of anatomy and physiology and three or more upper level science courses.<sup>20</sup> Additionally, prospective PA students have to find time to shadow and get letters of recommendations from practicing PAs. The numerous admission prerequisites can be overwhelming and stressful.<sup>21</sup>

Prospective students potentially face a large financial burden applying to PA school. CASPA is used to apply to each program at a cost of \$179 for the first program and \$56 for each subsequent program.<sup>22</sup> Students are subjected to additional fees taking a variety of standardized entrance exams such as the GRE, PA-CAT, CASPER, and sending each program the individual results.<sup>23</sup> Despite spending thousands on prerequisites, standardized entrance exams, and application fees there was only a 37.01% matriculation rate for the 2020 to 2021 application year, up from 34.74% of the previous year; most students who completed all the prerequisites and paid the fees to apply did not get accepted to a PA program in 2021.<sup>24</sup> The process and resultant stress of applying to PA programs can put potential students in a compromised mental state before starting a PA program.

Once accepted to a specific PA program, students must prepare for the challenging coursework ahead. The first stage of PA programs is the didactic phase, which focuses on classroom learning. Classes can be scheduled from 9:00am to 5:00pm, covering complex medical topics and diseases, typically with weekly evaluations in the form of tests or quizzes.<sup>25</sup> After spending an average of 30-40 hours a week in the classroom, students spend additional time studying topics outside of the classroom. After 12 to 18 months of the didactic phase, there are 12 to 18 months of the clinical phase.<sup>26</sup> In the clinical phase, students transition into the hospital and rotate through different medical specialties to practice taking care of patients. Students learn different clinical skills that are applicable to being a competent provider. During the clinical phase, the majority of PA students pay full tuition and work greater than 40 hours a week while studying for end of rotation exams.<sup>27</sup> Additionally, 36% of PA programs require a capstone project or master's thesis, which must be completed before graduation.<sup>28</sup>

Boston University's (BU) PA program is different from many PA programs, with a strict adherence to the medical school model. PA students start the program by taking an abbreviated first year of medical school focusing on science foundations before joining second year medical students in their classes. PA students must have proficient understanding and knowledge of the material, being tested every two to three weeks, before moving onto the next topic. Uniquely, BU PA students attend the same lectures and take the same exams as BU medical students. This fosters a higher level of medical knowledge, but the standards and professional expectations of the PA students are not the same. PA students have mandatory attendance for all lectures while medical students

have optional attendance for more than 95% of the lectures, a stark inequality and potential contributor to stress levels of PA students due to increased academic expectations.<sup>29</sup> Differing expectations of attendance at BU medical school and BU PA school for students even in the same lectures, highlights the different approaches to medical education between the health professions and the deficiencies around mental health that exist for PA students.

Boston University's Physician Assistant program clinical phase is similar to many PA programs with mandatory and elective rotations that allow a student to explore clinical interests. Generally, PA students are given two to four elective rotations in different areas of surgery and medicine. Students must provide their own vehicle and pay the associated transportation costs of getting to their assigned rotation locations. Per the PAEA, PA students in the clinical year pay tuition while working 40 to 60 hours a week without compensation. Each rotation lasts four to six weeks and ends with a summative callback day that has lectures and an end of rotation exam.<sup>30</sup> At many PA programs, no study day is given between the last working rotation day and the callback day when the exam is administered forcing PA students to find time to study after working an equivalent full-time job. Additionally, the only academic break given after each clinical rotation is the weekend between callback day on a Friday and the start of the next clinical rotation on a Monday, where students are expected to prepare for their next rotation.<sup>31</sup>

PA program tuition is expensive for students. A large stressor is the financial burden of attending a program. The average public PA program tuition is between \$52,585 and \$93,3113 for in-state and out-of-state respectively in 2020. The average

private PA program tuition is \$95,058 during the same period.<sup>32</sup> The Boston University Physician Assistant Program tuition is \$131,365 as of 2020, \$35,000 more for the same degree.<sup>33</sup> BU PA students also have to deal with a cost of living significantly higher than national average with a studio apartment in Boston costing an average of \$2,637 in 2022, with an annual cost of \$31,644 for housing.<sup>34</sup> The required car for transportation and associated operating costs increase the annual living expenses another \$2644, not factoring in the outright cost of the car.<sup>35</sup> The cost of attendance totals out to \$207,371 for BU PA students. The cost of attendance is excluding other mandatory expenses that coincide with living like groceries, utilities, car purchase, and parking. These elevated living expenses for students exist at other PA programs in expensive metropolitan cities, such as, Los Angeles, San Francisco, New York City, and Miami.<sup>36</sup> Most PA programs prohibit students from working during the entirety of the program as doing so would put students at academic risk, so all of the financial obligations must be met with loans, personal savings, or familial support.<sup>37</sup>

PA students experience emotional stress often moving cities or states to attend a PA program. PA program acceptance is competitive; the competitive nature means individuals are not likely to get into a program in their city or state with over 50% of students attending PA school out of state.<sup>38</sup> Students lose access to support systems with distance and struggle to attend marriages, visit friends and family, and birthdays during the average 27-month program.<sup>39</sup> This social isolation can be detrimental to mental health during the rigor of PA school and students may falter in crucial elements of self-care, such as sleep hygiene and personal activities.<sup>40</sup>

Consistent stress in PA programs has long-standing effects on students. Research suggests that long-term stress can cause issues with overall health, such as nutrition, physical health, and mental health, including depression, psychiatric illnesses, self-harm, and even suicide.<sup>41</sup> High levels of consistent stress have been linked to decreased motivation, trouble sleeping, and high blood pressure. Students in the medical field are more likely to be diagnosed with common mental disorders and more likely to be prescribed antidepressants or anti-anxiolytics than others in the same age bracket.<sup>42</sup> Additionally, there is increased risk for suicidal ideation in graduate medical science programs.<sup>43</sup> Suicide prevention is an important topic for all PA programs. PA students can develop unhealthy habits for coping with these constant stressors. These can include self-harm, poor eating habits, or even substance abuse.<sup>44</sup> Chronic stress and depression can contribute to worse health outcomes over the course of one's lifetime.<sup>45</sup>

In this paper, poor mental wellness refers to emotional distress that leads to a decreased mood/depression and increased anxiety. Emotional distress is defined as a negative emotional response to a pattern of events or experiences. Decreased mood is defined by loss of interest in activities, feelings of worthlessness, decreased concentration, and/or thoughts of harming oneself. A chronically low mood has been associated with self-harming behaviors like suicide.<sup>46</sup> Evidence has shown that increased levels of stress can cause a decrease in overall mood. Stress, as well as the resulting sleep disturbances and difficulty concentrating, has been associated with decreased academic performance.<sup>47</sup>

Increased stress levels and decreased mood in PA school affects academic performance as well as overall health. The numerous topics that PA students study in 27 months create chronic stressors and poor mental wellness, affecting students' ability to learn. Over time, these psychological stressors impair decision-making and cognitive abilities.<sup>48</sup> Academic performance is of great concern to PA programs so it is imperative that administration incorporate effective stress reduction policies in students' medical education, allowing students freedom to practice self-care, while achieving striving for academic excellence. Moreover, there is an association between stress and burn out among students; when stress is not reduced, individuals are more likely to be unhappy in their career choices, practice self-harm, and have lower academic performance compared to less stressed peers.<sup>49</sup> As psychological stress affects academic performance, PA programs must prioritize reducing stress through thoughtful and researched interventions that improve mental wellness.

## **Existing research**

### Epidemiology

Hoover et al., 2022, finds stress prevalent among PA students and, therefore, increases emphasis on stress reduction. This study was conducted on new students at nine PA programs around the United States with 294 students surveyed. The research focused on student experiences of stress and use of stress reduction techniques such as exercise and

social interaction to help manage well-being in PA school. Over half (64%) of polled students practiced stress reduction activities at least once per month. The most common stress reduction activities were related to exercise, such as going to the gym or practicing yoga. While most students realized which activities reduced their stress, the realities and expectations of PA school meant that only 16% reported frequently doing these activities during school. Students had an active interest in interventions supporting wellness with 77.5% endorsing proposals designed to reduce burnout and improve well-being. This study was strengthened by sampling schools in different geographic regions, gathering data of students exposed to differing costs of living, cultural standards, and environmental conditions, providing a sense of generalizability to extrapolate results to other PA students. A weakness of the study was the collection of one year of data, which does not account for geopolitical, environmental, or even global health events that can skew data in a particular year.<sup>44</sup>

Johnson et al., 2020, finds a link between depression, anxiety, and burnout in PA school education. This cross-sectional study was performed at eight programs in Virginia with 320 PA students surveyed throughout the school year in 2018. Specifically, two-thirds (69.7%) of the polled PA students reported emotional exhaustion from the pressures of school and 39.7% met the definition for cynicism with regards to their medical education and concomitant mental health. Emotional exhaustion and cynicism increased throughout the academic year with students reporting feeling more burnout the longer they were in school and exposed to high levels of stress. Higher levels of emotional exhaustion and cynicism were associated with increased levels of depression

and anxiety. The mean depression and anxiety levels varied with each sampling of students, indicating that students have individualistic responses to acute stressors experienced during the school year. The study concludes that students with lower levels of stress report less depression and anxiety and illustrates the importance of having time to manage mental wellness throughout PA education to reduce burnout, depression, and anxiety. A strength of this study was the collection of responses from first- and second-year PA students, accounting for different academic expectations throughout the didactic and clinical portion of PA education. Conversely, the study has reduced generalizability as only Virginia students were surveyed.

Lamb et al., 2020, is a retrospective study at University of Utah medical school exploring the effects of implementing mandatory attendance for medical students in 2010 and the result of switching to optional attendance in 2017. Over 600 student and 50 faculty responses were analyzed over the nine years from different evaluations sent throughout the year. Prior to 2010, lecturers and professors in the medical school felt their time was being wasted with less than 10% of the class attending lectures by the end of the first year of medical school. Faculty felt that mandatory attendance in lectures would promote development of professional identity by holding students accountable, so a mandatory attendance policy was implemented in 2010. Sampling students and faculty from 2010-2016 found that the change in attendance resulted in increased anxiety of students over lack of flexibility, while faculty recorded a degraded trust between faculty and students by infantilizing student behavior. During this time, students found ways to circumvent attendance, leaving after roll call and having friends electronically sign in for

them in later years, forcing faculty to police this dishonesty in the cohort. The associate dean for student affairs admitted that, in 2010-2016, over 10% of time in the department was addressing professionalism concerns around attendance/absences, providing evidence that mandatory attendance is costly to staff and administrators as well as students. To improve student well-being, 5 grace days with flexible attendance were provided in 2016, before removing mandatory attendance in 2017. The study further concluded that mandatory attendance in the medical school from 2010-2016 corresponded with a decline in standardized exam scores compared to other schools in the nation. Conversely, in 2017-2019, all students passed and standardized exam means increased 5 points with the implementation of optional attendance, suggesting that increased autonomy does not hinder academic performance.<sup>50</sup>

In recent years, COVID and pandemic-related concerns about health have only increased psychological stress students endure. The fear of getting sick, being treated if sick, and managing academic obligations if sick has drastically worsened for students in recent years due to the COVID-19 pandemic.<sup>51</sup> PA students are at increased risk of illness due to regular contact with sick populations and, in the case of COVID-19, increased exposure to death. The stress surrounding complications arising from COVID-19 has been linked to a substantial decline in mental health of students in medicine in recent years.<sup>52</sup> Research shows medical student stress is increasing throughout the US in light of the pandemic but there is a lack of research looking at PA student stress and interventions to reduce it.

The most common stressors for graduate medical education students are schoolwork, mortality exposure, and cultivating a professional identity.<sup>53</sup> Frias et al., 2021, found that most PA students surveyed felt they were unable to control important decisions in their life, as well as difficulties were building up to a point that they thought they could not overcome in relation to PA school obligations. This study surveyed 4000 matriculating and 2700 graduating PA students in 2017 with 163 of the then 198 PA programs participating being representative of PA students at large. The most frequently listed PA school obligations were attendance requirements, studying, and clinical skill development. The article found that students were almost uniformly exposed to an immense amount of stress during the rigorous schooling to become a PA, the most frequent of which, attendance, being controllable by program policy.<sup>54</sup>

#### Reasons for PA Programs to Engage

Understanding these stressors and working on mindfulness interventions to reduce stress should be important to PA programs and their faculty. Stress from financial burden, social isolation, academic expectations, as well as academic professionalism can lead to depression and cognitive decline.<sup>55</sup> Chronic stress decreases the ability to focus and impacts knowledge retention. More worryingly, chronic stress can lead to mental health instability, substance abuse, depression, and even suicidal ideation in some students. The result of decreased mental health in PA students means they are less likely to have continued professionalism and express empathy toward patients. Declining mental health

has implications that extend past school into the practice and can lead to suboptimal care for patients.<sup>56</sup> PA faculty are already under an immense amount of stress trying to implement a rigorous curriculum in a relatively short period of time and may be hesitant to implement new wellness interventions but the far reaching benefits of these policies outweigh the possible cons.<sup>57</sup> PA programs benefit from incorporating stress reduction interventions, as reduced stress is associated with improved academic performance and overall mental health in students. High academic performance lowers attrition rates, a common goal across all PA programs. Policies focusing on improved mental wellness strengthen the student and faculty relationship and are received favorably by students who feel overwhelmed.<sup>58</sup>

### The Benefits of Incorporating Flexible Attendance Days

Underlying mental health disorders can surface in PA programs due to the intense pressures put on students. Less than half of students that have symptoms of a mental health disorder seek treatment or therapy, so PA program faculty would benefit by implementing proactive stress reduction policies.<sup>59</sup> Research has found that attendance requirements are a common cause of stress for PA students with students unable to deal with stressful life circumstances due to school obligations. Research in medical schools has shown that mandatory attendance fosters distrust between faculty and students, while yielding lower exam scores. Optional attendance in medical schools was associated with reduced psychological stress, improved mental health, stronger faculty-student trust, and

higher standardized exam scores. Illustrating that, attendance is a modifiable stressor that can be improved through PA program intervention. Including flexible attendance days in attendance expectations allows increased student autonomy in PA school and its effect on mental wellness to be researched. The implementation of flexible attendance days with decreased professional accountability for PA students, similar to what is the status quo for many medical students across the nation, fosters an academic environment that caters to the success of students, while also recognizing life circumstances change unexpectedly. This slight decrease in professional accountability still allows PA faculty to oversee students and encourage professional identity development, while at the same time providing students time to manage acute stressors that present during the academic year without faculty oversight.<sup>60</sup>

## **METHODS**

### **Study design**

This study utilizes an analytic interventional design to examine the effects of implementing five mental health days per semester with flexible attendance on the psychological stress levels and mental wellness of physician assistant students during the first 12 months of PA school. The study will be conducted at one PA program in each of the five regions of America: the Northeast, Southeast, Southwest, Midwest, and West. The five regions sampled will be based on geographic classification established by Physician Assistant Education Association (PAEA), the accrediting body of PA school education.<sup>61</sup> PA schools with provisional accreditation or accreditation probation will be excluded from selection, as educational expectations and standards could change during the study, as schools come into compliance or get full accreditation after being established. Additionally, schools with an existing flexible attendance policy will be excluded, as there would not be a baseline to compare. PA schools eligible and interested in the study will submit an interest form, and a random number generator will be used to choose a program in the case of multiple eligible and interested programs in a particular geographic region.

### **Study population and sampling**

The study population consists of PA students in the US. The sample will include the next four incoming PA classes at five PA schools across the country. Inclusion criteria require acceptance into the participating PA program and the submission of the student's intent to attend form. Assuming an estimated average PA class size of 40 students, 75% survey participation from each class would result in approximately 30 participants sampled per program per year.<sup>62</sup> The first and second year of the study would serve as the control group/baseline for the five programs, while the third and fourth year of the study would serve as the experimental group. This provides a total sample size of 600 student participants, 300 in each group, across the five schools, representing approximately five percent of the estimated US PA student population of 12,000, giving this study 80.0% power to detect an effect size of 0.229, a small Cohen's d, allowing this study to detect small effects.<sup>63</sup>

## **Intervention**

Before the start of the PA students' curriculum, random identification numbers will be assigned to each incoming student to anonymize survey results at the program level. The experimental and control groups will not be blind to the study specifics and comparisons to other years of students. The control group will have mandatory attendance for all academic classes. The experimental group will have five days per year of flexible attendance with no expectation of notifying faculty immediately preceding or after class. The experimental group participants would be expected to email respective faculty within

24 hours of the missed class stating the use of one of the five days but with no specific reason necessary to ensure all students are physically safe. Both groups will be sent three surveys within the 12 month period, one prior to the start of the program, one at six months, and one at 12 months. The surveys will cover topics related to mental health, stress, and academics.

### **Study variables and measures**

The primary data will be collected using a validated survey, which include 10-point Likert scale questions assessing depression, anxiety, stress levels, stress management, and capacity to handle schoolwork. The scale ranges from, strongly disagree (1) to neutral (5) to strongly agree (10). The top of the validated survey will read, “rate your level of agreement with each statement.” The questions will read as follows, “I feel depressed throughout the week, I feel anxious throughout the week, I feel high levels of stress throughout the week, I feel unable to manage my stress levels, and I feel I do not have the capacity to handle my schoolwork throughout the week.” The dependent variables are depression, anxiety, stress levels, stress management, and capacity to handle schoolwork. The independent variable is the flexible attendance days. Cronbach’s alpha ensures the survey scale is reliable and internally consistent with a value of 0.70. The survey will be validated to measure stress to ensure the relationship between a student’s perceived stress and value of flexible attendance day can be quantified.

## **Recruitment**

Prior to the start of PA school, students in the participating PA programs will receive an email providing an overview of the nationwide survey focused on improving the PA school experience. The email will be sent to the control and experimental group focusing on assessing mental health and stress after starting PA school with possible flexible attendance days to maintain informed consent. The email will state that participation in the experiment will not negatively interfere with their studies. Students will be informed of the existence of the other group in prior/future years. The email will include a consent form to be surveyed prior to the start of the program but all students regardless of survey participation will be extended the same designated privileges based on their year in the survey.

## **Data collection**

Prior to each PA school's program start, students will be sent a survey electronically using Qualtrics by the PA program director focusing on current mental health status and stress levels. At student orientation, a reminder of survey completion will be given. Identical Qualtrics surveys will be sent out at the 6-month and 12-month mark of the student's initial academic year. Students who do not complete the initial survey will not be sent future surveys at described milestones. The survey forms will use previously

generated identification numbers to maintain participant confidentiality and avoid researcher bias.

### **Data analysis**

Quantitative data analysis will be conducted for survey responses collected using t-tests with mean and standard deviation calculations at program start, six months, and one year. The data from the experimental and control groups will be analyzed within and between the five participating PA programs by comparing the calculated program specific means in the experimental and control group as well as comparing experimental and control group data together for all 5 programs. The means of each sampled question by group designation in an individual program will be plotted on a line chart for multivariate regression analysis considering the effects of all dependent variables and significant relationships between them before combining all 5 programs group designations to see the PA program with greatest interventional effect was as well as an average interventional effect across programs. Each dependent variable will have its own model. The alpha for analysis will be 0.05 to reject the null hypothesis.

Additional analysis will be done within designated groups comparing responses between different participant age categories, in one of ten the year increments 15-25, 25-35, 35-45, 55-65. Analysis will also be done within designated groups comparing participant stated gender. Student attrition within the program/sampled will be reported as

the total number in each respective group, but those students will not be sent further surveys.

### **Timeline and resources**

The first step is selecting and soliciting interest for one PA program from each of the listed geographic region to participate in the research. Contact emails must be collected for PA program around the US, and correspondence sent via email to all PA programs listed in the PAEA directory. The email will contain information on the proposed research study, as well as how to submit an interest form for participation. In the case of more than one eligible school submitting interest in a particular region, a random number generator will choose the program. The second step is meeting virtually with the chosen PA program faculty and the study coordinator to discuss the proposed study, specific instructions for administration of the study, and answer any questions about implementation/execution or otherwise.

The third step is the implementation of the proposed study. At this time the programs will receive the opt in survey consent form and surveys prefilled with program information and randomly assigned identification numbers to be used by participating students for the entirety of the study. The study coordinator will be in contact with the school during the experiment ensuring surveys go out the specified time increments. The study encompasses four matriculating class of PA students for 12 months each. The experiment should take 4 years to complete. The final step is data analysis by a trained

statistician. Data will be analyzed as it is collected and sent out over the course of the 4-year experiment, allowing post experimental analysis to be completed in 6 months or less.

The study will require approximately 5 years to complete. This includes the time required for finding five participating PA programs across the country (3 months), obtaining program information/confirming eligibility (3 months), implementing the experiment over the course of four PA program cohorts (4 years), and completing post experimental data analysis (6 months). The study will involve a regional study coordinator, statisticians, and five participating PA programs in the respective geographic regions and be fully completed in 5 years. The necessary resources include internet access for survey distribution as well as email for contact and correspondence. There are no significant financial costs associated with the study.

### **Institutional Review Board**

The study will be submitted to the Institutional Review Board (IRB) of Boston University Medical Center for an exempt review. The proposed study involves benign situational interventions conducted in well-established educational settings and is unlikely to negatively impact learning opportunities. The proposed research will use de-identified records and anonymous surveys. Participants will be 18 years old or older. Data collection will only use numerical identifiers to protect participant privacy. The study

will adhere to the ethical guidelines and regulations specified by the Institutional Review Board.

## CONCLUSION

### Discussion

The survey-based methodology employed in this analytic interventional design study provides a better understanding of mental health and stress among PA students by exploring cohort trends with the creation of five flexible wellness days, allowing for cause-and-effect relationships to be determined with a validated survey. By collecting anonymized data directly from students, the study reduces possible skewed results and biases that can be reported by outside observers, as well as encouraging authentic responses without fear of identification or retaliation by faculty. As student participants lack blinding to proposed solutions or intervention tested in student correspondence describing the study, researchers introduce subject bias of presumed improvement to mental wellness and stress reduction due to knowing about the intervention.

However, limitations exist, such as the challenge of recruiting participating PA programs, potential low student participation, and control and experimental groups being different years. Elective program participation could be hard, as there is little incentive for schools to change professionalism standards if academic performance is satisfactory. With 95% of PA programs having mandatory attendance, this study could undermine many years of established traditions and expectations at a program, making it difficult to transition back to mandatory attendance at completion. Another limitation is the survey's optional nature, which could result in low participant retention even after opting in to be surveyed, as there is no immediately visible benefit to an individual student's survey

contributions, which could be improved with a raffle for a gift card if funding allowed. Decreased student participation would make it harder to extrapolate results to the general population of PA students. Additionally, the study breaks up the control and experimental groups into different years, as having half of the PA students in a program have additional privileges compared to their peers would be considered unethical. The result is that additional variables, geopolitical, global health, etc., could be at play within the 4 years that cannot be isolated, as would be the case if control and experimental groups were from the same year. An additional limitation is that interventional effect is calculated using multiple values from individuals (paired/grouped data) across different programs (independent data).

Finally, the study does not account for the many different variables that exist in the more than 200 PA programs across the US, including cost of living, social, and weather differences to name a few, which may affect generalizability. However, the inclusion of five different geographics regions increases generalizability and could be further improved in future studies by including multiple schools in each region or one school per state. Nor does it assess pre-existing mental health conditions, which could impact the results and should be considered in future studies. The study's association between exposure to flexible attendance days and variable outcome of mental wellness would strengthened with in a different study if students group was split between class, however, it would be unethical to give students in the same program different privileges with half of PA students in the experimental and control group. Further research might include more regions or occur over a longer period of time.

## **Summary**

Based on the literature review, mental wellness and stress are a main issue in PA schools around the US. The academic, financial, and social pressures that occur in PA school lead to students experiencing mental health stressors, such as depression and anxiety, that can make daily life hard. Student retention, GPA, and interpersonal relationships can also deteriorate throughout the year in the setting of increased stress. High levels of expected professional accountability with little flexibility can push students to potential crises.

Flexibility, predominantly in an academic setting, helps relieve some of the stressors PA students can experience. Flexibility allows students to put mental wellness and stress reduction first, focusing on a shared student-faculty goal of completing a degree program. Mental wellness days in PA school more closely emulate professional expectations placed on physician-track medical students around the nation and allow programs to implement changes that could foster a stronger relationship between faculty and students.

Therefore, if the hypothesis is confirmed, implementing five wellness days per year for PA students would represent a cost-free and subjectively simple way to improve mental wellness and foster stress reduction. The hypothesized improvement to mental wellness would allow students to perform better academically, as well as decrease student attrition. This increased mental wellness could also translate into a clinical setting with students having a greater capacity to connect with patients having taken care of their own

mental, physical, and emotional needs first. Finally, innovative wellness changes to a program can look attractive to potential future students considering which PA school would be the best fit.

### **Clinical and/or public health significance**

Ultimately, addressing mental health in PA education has broad implications for the well-being of future practitioners and the healthcare system as a whole. Mental health is a prolific problem throughout the US and stress plays a large factor in mental health decline. With many studies focusing on medical students' education and stressors throughout the years, PA students would benefit from similar focus and interventions that lessen the mental burden that a challenging degree in medicine brings. As a fast-growing profession that is involved in all facets of medical care throughout the nation, it is important to research solutions to mental health in PA programs.

This proposed study could encourage positive change in PA schools around the nation, improving the lives of over 12,000 PA students each year. Students graduating with an improved level of mental wellness grow into more compassionate and caring practitioners, providing care to vulnerable populations that need it most.

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## CURRICULUM VITAE





