

Wellness in Physician Assistant Education: Exploring Mindfulness, Well-Being, and Stress

Eve B. Hoover, DMSc, MS, PA-C; Bhupin Butaney, PhD; Susan LeLacheur, DrPH, PA-C; Howard Straker, PhD, PA-C; Kari Bernard, PhD, PA-C; Bettie Coplan, PhD, PA-C; Candra Carr, MS, PA-C; Laura Blesse-Hampton, MS, PA-C; Ameer Naidu, MMS, PA-C

Purpose The current study examined stress reduction activities most commonly used by matriculating physician assistant (PA) students to better understand how students are approaching self-care and management of stress. In particular, the study examined levels of mindfulness and well-being to understand how these relate to various stress reduction approaches at the time of matriculation.

Methods Newly matriculated students at 9 PA programs located across the nation were surveyed (n = 294). Validated survey instruments assessed levels of mindfulness and general well-being. Stress reduction activities were also assessed. Univariate and multivariate analyses were used to examine levels of mindfulness and levels of well-being to see how these relate to various stress reduction approaches.

Results The survey response rate was 72%. Nearly one-third of respondents (32%) identified meditation as one of their stress reduction activities, and more than half (53%)

reported having participated in mindfulness practice at least once in the past year. Sixty-four percent of students reported awareness of mindfulness practices, while only 16% reported frequent practice within the year prior to matriculation. When looking at variables of interest, decentering and psychological flexibility were significant in accounting for student-reported perceived stress and life satisfaction.

Conclusion PA students are likely receptive to mindfulness-based interventions that have the potential to improve well-being and reduce stress. There is opportunity for programs to incorporate reliable and structured training within curricula that effectively increases levels of mindfulness and, in doing so, can lead to improvement in perceived stress and life satisfaction. Further research may assist educators in the development of strategies to promote student and clinician wellness.

INTRODUCTION

Clinician wellness has become the focus of many national initiatives developed in response to the provider burnout epidemic.^{1,2} National strategic actions outlined by the National Academy of Medicine Action Collaborative on Clinician Well-Being and Resilience include the utilization of well-being programs to ensure the psychological safety of clinicians.³ Early curricular exposure within academic training to topics such as provider burnout and strategies to promote self-care may enrich professional development and lead to improved patient care.

Recent COVID-19 and pandemic-related health concerns have placed increased stress on the healthcare practitioner. The challenges faced by healthcare providers extend beyond immediate health risk to their patients, colleagues, and self and also include challenges stemming from how to shift delivery of care to virtual platforms or modify patient care protocols to minimize potential risks while maintaining standards of care. Many providers may also be facing moral and personal conflicts between loss of practice-based income and decisions about safety or concerns related to exposing vul-

nerable loved ones at home. Early career providers and student trainees and residents are typically more vulnerable to adverse impacts associated with these elevated stress factors. The rising levels of burnout in medical professionals have reached epidemic proportions and may have far-reaching negative effects on students, clinicians, patients, and other members of the community.¹ Thus, developing self-care strategies and stress reduction skills in healthcare students is paramount and critical to offset the increased risk for burnout and compassion fatigue as they advance in the profession. Stress reduction activities have been studied in nursing and medical education programs, but limited attention has been given to education and training within the physician assistant (PA) profession.^{4,5}

Physician assistant education, similar to many other health education programs, can be academically, physically, and mentally challenging.⁶⁻¹⁰ PA students face a variety of stressors during medical training. Moderate exposure to heightened stress may be beneficial,¹⁰ providing motivation and sparking creativity, innovation, and development of resiliency skills pertinent to future practice. Maladaptive responses to stress, however, have been linked to increased emotional distress, burnout, compassion fatigue, and medical mistakes.^{2,10,11} PA student-reported experiences of burnout were found to be high in a recent study.¹² Over three-fourths (79%) of PA students reported high levels of emotional exhaustion and more than half (56%) met the criteria for cynicism.¹²

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As of September 2020, PA program accreditation standards (B2.04) require that PA program curricula address personal wellness including prevention of impairment and burnout.¹³ Moreover, innovative curricular strategies that prioritize student wellness and resilience may provide a framework to support self-care and to supplement ongoing, national well-being initiatives. A recent survey indicated that 77.5% of PA students endorsed incorporating a wellness intervention designed to reduce burnout.¹² Moreover, when asked about components of a wellness program, 70% endorsed mindfulness as an important component to be included in such a program.¹² Another recent study involved development of a curricular approach that embedded decentering training and education into an existing PA course. This curricular intervention, using educational activities and experiential learning exercises, significantly increased levels of mindfulness and decentering.¹⁴

Mindfulness

Mindfulness training can be useful to students as an effective way to develop coping tools, prioritize self-care, and foster wellness by strengthening students' communication and connection with patients and other members of the healthcare team.¹⁴⁻¹⁷ These skills cultivate professional competencies essential for medical professionals.⁶ A national survey exploring medical school strategies to address student wellness found that over half of the responding medical schools included curricular components focused on well-being.¹⁸ The majority of these schools (93%) offered mindfulness meditation training within the well-being curriculum.¹⁸ Within PA programs, only a few studies have examined the role of stress reduction activities in PA student well-being or mindfulness training. Results of one study revealed that a mindfulness-based curriculum incorporated into an existing PA professionalism course effectively increased and produced changes in mindfulness that were positively associated with respective changes in perceived stress and life satisfaction.¹⁴

Awareness of thoughts, particularly self-criticism, is also important for medical trainees.⁶ Decentering is a skill-based component of mindfulness focused on the objective observation of experiences.¹⁹ A decentered perspective allows space between stimulus and response; this space can support one's ability to choose an action rather than reacting without forethought. An individual may also recognize that not all thoughts represent truth; labeling thoughts as temporary rather than permanent can lead to decreased rumination and anxiety.¹⁹

Several aspects to mindfulness have been found to promote personal health benefits, which include improved interpersonal relationships, decreased anxiety, increased self-compassion, and a greater capacity to tolerate and manage overwhelming emotional responses.²⁰⁻²² The underlying mechanism through which mindfulness can affect positive outcomes in healthcare delivery is its ability to help the provider practice present-moment attention. This attention disempowers maladaptive cognitions that can interfere with decision-making and receptive information processing. Lack of present moment awareness can lead to habit and impulsive responding rather than actions or choices with intentionality grounded in the present situation.²³

A related and overlapping ability associated with mindfulness is psychological flexibility.²⁴ Its key function within a mindfulness

framework is the capacity to shift attention from one moment to another and accept the present moment without interference from past moments or events. In other words, psychological flexibility allows an individual to move from one moment of attention to the next, be present and aware in the current moment, and let the past remain in the past.

Stress reduction approaches adopted by students in health care have received limited attention in the literature. In particular, there is limited understanding about which stress-reduction activities commonly practiced are associated with higher levels of mindfulness and general well-being. Better understanding of baseline information related to self-care strategies, well-being, and mindfulness can provide the basis for designing efficient and effective curricular interventions.

Current Study

The current study involved 9 PA programs from across the country and assessed the most common stress reduction activities utilized by incoming PA students, as well as their awareness and practice of mindfulness at the time of matriculation. This study also explored the concurrent relationship between mindful awareness and attention, decentering, and psychological flexibility and well-being. The findings offer insight into the potential use of mindfulness-based curricular interventions and serve as a basis for further research on the impact of mindfulness training on PA student wellness. The research questions were:

- What stress reduction activities are used by PA students at the time of matriculation?
- Are PA students aware of mindfulness practices at the time of matriculation?
- Is there a relationship between stress reduction activities and current levels of mindfulness and well-being?
- Are level of mindfulness and related abilities associated with well-being?
- Can level of mindfulness and related abilities (decentering, psychological flexibility, and present moment attention and awareness) predict level of well-being (perceived stress and life satisfaction)?

METHODS

Participants

After obtaining all necessary IRB approvals, newly matriculated students at 9 PA programs located across the nation were surveyed ($n = 294$). The students were invited to participate in a voluntary study that was part of a larger, longitudinal, multisite study exploring the role of changes in levels of mindfulness in explaining changes in perceived stress and life satisfaction. After providing informed consent, students were surveyed using REDCap software (Vanderbilt University), and the data collected were anonymous and confidential.

Instrument

Participants completed an 86-item instrument that included questions related to demographics, stress management practices, awareness and practice of mindfulness, and

validated measures of mindfulness, psychological flexibility, life satisfaction, and perceived stress:

- Background section: standard demographics and items related to students' current stress management practices and prior awareness and experience with mindfulness-based practices. Students were asked to identify practices for stress management; they were provided a list that included exercise, yoga, meditation, Tai Chi, journaling, and "other" (with the ability to provide a free text response) and asked to select all that apply.
- Experiences Questionnaire Decentering Subscale (EQ-D): an 11-item instrument that measures the capacity to separate oneself from one's thoughts and feelings in order to choose action rather than reaction in situations. A sample item is "I remind myself that thoughts aren't facts," and response options include *never*, *rarely*, *sometimes*, *often*, and *all the time*. Higher scores indicate higher levels of decentering capacity. For the purpose of this study, the aspect of mindfulness measured through the EQ-D will be referred to as *decentering ability*. Internal reliability of the EQ-D has been established with exploratory factor analysis among samples of university students, and it has been meaningfully validated against measures of experiential avoidance, brooding rumination, emotion regulation, and depressive and anxious conditions.²⁵ The EQ-D has been used in prior studies to assess levels of decentering after delivery of mindfulness-based stress reduction interventions.²⁵
- Acceptance and Action Questionnaire (AAQ-2): a 7-item scale that measures psychological flexibility and the ability to fully connect in the present moment without being hindered by thoughts and feelings that may activate defensive responding or experiential avoidance. A sample item is "I worry about not being able to control my worries and feelings," and response options include *never true*, *very seldom true*, *seldom true*, *sometimes true*, *frequently true*, *almost always true*, and *always true*. Because flexibility and acceptance are key components of mindfulness, lower scores on the AAQ-2 are associated with higher levels of mindfulness.²⁶ For the purpose of this study, the aspect of mindfulness measured through the AAQ-2 will be referred to as *psychological flexibility*. The AAQ-2 has demonstrated reasonable internal reliability (Cronbach $\alpha = .93$) and moderate correlations with several measures of similar constructs, such as thought suppression, thought control, and social desirability.²⁷
- The Mindful Attention Awareness Scale (MAAS): a 15-item scale that assesses an individual's level of awareness regarding the present moment.²⁸ A sample item is "I find it difficult to stay focused on what is happening in the present," and response options include *almost always*, *very frequently*, *somewhat frequently*, *somewhat infrequently*, *very infrequently*, and *almost never*. For the purpose of this study, the aspect of mindfulness measured through the MAAS will be referred to as *present moment attention and awareness*. Higher scores are associated with higher levels of mindfulness. The scale has demonstrated good internal reliability (Cronbach $\alpha = .80$ to $.87$) among samples of university students and the general public. Its construct validity has been established by expert review and focus groups, and its convergent and discriminant validity has been established against measures of openness to experi-

ence, emotional intelligence, self-consciousness, mindfulness/mindlessness, rumination-reflection, cognitive engagement, and self-monitoring.²⁸

- Satisfaction with Life Scale (SWLS): a 5-item scale that assesses global life satisfaction and has been shown to correlate with subjective well-being.²⁹ A sample item is "The conditions of my life are excellent," and response options include *strongly agree*, *agree*, *slightly agree*, *neither agree nor disagree*, *slightly disagree*, *disagree*, and *strongly disagree*. Higher scores indicate higher satisfaction with life. The SWLS has demonstrated strong correlations with several subjective well-being measures, confirming its construct and criterion validity. It has also demonstrated strong internal reliability (Cronbach $\alpha = .87$) and test-retest reliability (correlation coefficient = $.82$).
- Perceived Stress Scale (PSS): a 14-item scale that measures individuals' perception of stress, including stress among PA students.³⁰ A sample item is "In the last month, how often have you dealt successfully with irritating life hassles?" and the response options are *never*, *almost never*, *sometimes*, *fairly often*, and *very often*. Lower scores are associated with lower perceived stress. The PSS has demonstrated strong internal reliability (coefficient $\alpha = .84$, $.85$, and $.86$) but variable test-retest reliability when originally administered among 3 samples, 2 made up of university students and one of individuals enrolled in a smoking cessation program. The test-retest variability was thought to have occurred secondary to differing intervals between the test and retest among the student samples (2 days, coefficient $\alpha = .85$) compared to the smoking cessation sample (6 weeks, coefficient $\alpha = .55$). Satisfactory concurrent and predictive validity of the PSS has been established using measures of life events, social anxiety, depressive symptoms, and physical symptoms simultaneously administered alongside the PSS.

Design and Analysis

For the main data analyses, prior mindfulness practice, age, and sex were controlled for and examined directly. Mindfulness was measured using the EQ-D (higher scores reflect higher levels of mindfulness), the MAAS (higher scores are associated with higher levels of mindfulness), and the AAQ-2 (lower scores are associated with higher levels of mindfulness). Well-being was measured using the SWLS (higher scores are associated with higher satisfaction with life) and the PSS (lower scores are associated with lower perceived stress).

Data were examined using univariate and multivariate statistical analyses. T-tests were used to examine mean differences for well-being and mindfulness measures between endorsers and nonendorsers of each stress reduction activity, including prior awareness and practice of mindfulness. Correlation analyses were used to examine the relationship among levels of mindfulness and related abilities and well-being. Multivariate regression analyses examined all mindfulness and related abilities collectively in a single model to determine which abilities were most salient in the prediction of levels of reported life satisfaction and perceived stress. To control for collinearity in the multivariate analyses, correlations among predictors were examined, and the variance inflation factor (VIF) and tolerance statistics were calculated for each of the predictors.

RESULTS

Participant Characteristics

From a mix of 9 publicly and privately funded PA programs located in the West, East, and Midwest regions of the United States, 410 students were invited to participate in the current study. Participants were students who matriculated between May 2019 and January 2020 and had completed all pretest study assessment instruments administered at the beginning of their first quarter within their respective PA programs. A total of 294 (72%) of the PA students responded to the survey with no single PA program contributing more than 24% to the total sample; 75% of survey participants were female. There was a wide range of ages among survey participants (21-51 years of age) with a mean age of 26.59 years. By comparison, the most recent national data on PA student demographics reveal that, as of July 2018, the mean percentage of first-year students in PA programs who were female was 72% and the mean age was 25.1 years.³¹

Stress Reduction Activities Utilized by PA Students

All students reported participating in some form of stress reduction activity prior to beginning their PA education. The most frequently reported stress management strategies were exercise (94%), yoga (55%), and meditation (32%); another tool used by PA students was journaling (26%). Other stress reduction strategies endorsed were listening to music, watching movies, Tai Chi, and prayer (16%).

Sixty-four percent (189/294) of students reported that they were aware of mindfulness practice at the time of matriculation. While 53% (154/293) of PA students also reported participating in some form of mindfulness practice in the year prior to entering their PA program, the frequency of mindfulness practice varied greatly. Forty-three percent of the sample had not practiced mindfulness more than once in the past year, while 16% reported participating in mindfulness practice at least weekly (Table 1).

Because the majority of participants (94%) endorsed exercise as a form of stress reduction, mean comparison by group (exercising/not exercising) on study measures was not examined. Prior yoga practice and meditation practice, however, were explored to see if participants who endorsed either practice differed on study measures from those who did not endorse prior yoga or meditation practice. Participants' mean scores for mindfulness measures (EQ-D, MAAS, AAQ-2) and well-being measures (SWLS and PSS) did not differ significantly between groups for yoga practice (yes/no) or meditation practice (yes/no). Therefore, prior yoga practice or meditation practice did not appear to be associated with levels of life satisfaction, perceived stress, and current levels of mindfulness at the start of the program.

Association Between Level of Mindfulness and Well-Being

All 3 mindfulness measures (EQ-D, AAQ-2, MAAS) were significantly correlated with life satisfaction (SWLS) and perceived stress (PSS). Correlations ranged between $r = .28$ to $.71$ and were significant ($p < .001$) (Table 2). Correlations among the mindfulness measures (EQ-D, AAQ-2, MAAS) ranged between $.38$ and $-.49$, indicating an association but no signif-

icant overlap or collinearity among these predictors (Table 2). Results from individual linear regressions for each mindfulness measure (EQ-D, AAQ-2, MAAS) predicting life satisfaction and perceived stress when controlling for age, gender, and prior mindfulness practice are shown in Table 3. Psychological flexibility (AAQ-2) explained 50% of the variance in perceived stress ($p < .001$) and 44.4% of variance in life satisfaction ($p < .001$), whereas decentering ability (EQ-D) explained 23.7% of the variance in reported perceived stress (PSS) and 20% of the variance in reported life satisfaction (SWLS). Present moment attention and awareness (MAAS) accounted for 18.5% of variance in reported perceived stress (PSS) and 10.4% of the variance in reported life satisfaction (SWLS).

Does Level of Mindfulness and Related Abilities Predict Level of Well-Being?

Although correlations among the 3 mindfulness measures (EQ-D, AAQ-2, MAAS) ranged between $.38$ and $-.49$ and did not indicate issues with collinearity, the variance inflation factor (VIF) and tolerance were examined for each predictor in the multiple regression analyses to control for potential collinearity (Table 4). The VIF statistic quantifies the severity of multicollinearity (variance in the full model divided by the variance of a model with a single term). For every predictor in our multivariate model, VIF was <2 , whereby values of >10 would indicate significant multicollinearity. Tolerance is the amount of variability in one independent variable that is not explained by the other independent variables; tolerance

Table 1. Background Information for Matriculating PA Students from 9 Programs in 2019-2020 (N = 294)

Variable	n (%)
Male gender	74 (25)
Mindfulness awareness	189 (64)
Mindfulness participation	154 (53)
Frequency of practice	
Never	96 (33)
Once in the past year	30 (10)
2-4 times in the past year	60 (21)
Once in a month	20 (7)
1-2 times per month	38 (13)
Weekly	24 (8)
2-3 times per week	14 (5)
Daily	10 (3)
Stress management practices	
Exercise	275 (94)
Yoga	161 (55)
Meditation	93 (32)
Tai chi	5 (2)
Journaling	75 (26)
Other	41 (14)

PA, physician assistant.

Table 2. Correlations Among Mindfulness (EQ-D, MAAS, AAQ-2) and Well-Being (SWLS, PSS) Measures in Matriculating PA Students (N = 294)

	EQ-D	MAAS	AAQ-2	SWLS	PSS	Age
EQ-D	1.00	0.38 $p < .0001$	-0.49 $p < .0001$	0.42 $p < .0001$	-0.47 $p < .0001$	0.04 $p = .5437$
MAAS		1.00	-0.42 $p < .0001$	0.28 $p < .0001$	-0.43 $p < .0001$	0.03 $p = .6460$
AAQ-2			1.00	-0.63 $p < .0001$	0.71 $p < .0001$	-0.09 $p = .1520$
SWLS				1.00	-0.61 $p < .0001$	-0.08 $p = .1816$
PSS					1.00	-0.07 $p = .2226$
Age						1.00

PA, physician assistant; EQ-D, Experiences Questionnaire Decentering Subscale; MAAS, Mindful Attention Awareness Scale; AAQ-2, Acceptance and Action Questionnaire; SWLS, Satisfaction With Life Scale; PSS, Perceived Stress Scale.

values less than 0.10 indicate collinearity. All values in the analyses were < 0.10 .

Results from multivariate regression analyses examining all 3 measures of mindfulness collectively in a single model to predict life satisfaction and perceived stress appear in Table 4. Mindfulness measures collectively, while controlling for age, gender, and prior mindfulness practice, predicted 53.1% of the variance in perceived stress. Decentering ability (EQ-D; $p < .001$) and psychological flexibility (AAQ-2; $p < .001$) contributed to the model's prediction, while present moment awareness (MAAS; $p = .070$) approached significance. Therefore, decentering and psychological flexibility were the most salient predictors of student levels of perceived stress.

This model also predicted 42.5% of the variance in life satisfaction (SWLS) with psychological flexibility (AAQ-2; $p < .001$) and decentering ability (EQ-D; $p = .004$) as the only significant predictors. Present moment awareness (MAAS) was not salient in predicting life satisfaction among PA students. Taken together, these results indicate that levels of psychological flexibility (AAQ-2) and decentering ability (EQ-D) were salient variables in accounting for both student perceived stress and life satisfaction, while present moment awareness (MAAS) did not seem to contribute to predicting either life satisfaction or perceived stress.

DISCUSSION

To align with national clinician wellness collaboratives and reduce the risk of burnout, health education faculty are tasked with instilling student self-care practices within training. In addition, accrediting agencies are beginning to require wellness components to training within program curricula.¹³ Healthcare educational programs can meet accreditation mandates and achieve national wellness goals by incorporating wellness components into curricula designed to prevent burnout and compassion fatigue and promote professional resilience. Baseline information related to self-care strategies, well-being, and levels of mindfulness of incoming students can inform development of efficient and effective interventions by enhancing knowledge about what strategies may be most effective.

The current study examined stress reduction activities most commonly used by matriculating PA students to better understand how current students approach self-care and manage stress. In particular, the current study examined levels of mindfulness and levels of well-being to see how these relate to various stress reduction approaches at the time of matriculation. The study found several interesting and important findings related to stress reduction practice and levels of mindfulness and well-being at the onset of training.

Table 3. Simple Linear Regression for Each Mindfulness Measure (EQ-D, MAAS, AAQ-2) Independently Predicting Perceived Stress and Life Satisfaction, Controlling for Age, Gender, and Prior Mindfulness (N = 294)

Independent Variables Predicting Perceived Stress (PSS)				
Variable	Estimate	SE	p-value	Adj. R-squared
EQ-D	-0.533	0.06	$< .0001$	23.7%
MAAS	-4.551	0.60	$< .0001$	18.5%
AAQ-2	0.672	0.04	$< .0001$	50.0%
Independent Variables Predicting Satisfaction with Life (SWLS)				
Variable	Estimate	SE	p-value	Adj. R-squared
EQ-D	0.324	0.04	$< .0001$	20.0%
MAAS	2.079	0.46	$< .0001$	10.4%
AAQ-2	-0.446	0.03	$< .0001$	44.4%

EQ-D, Experiences Questionnaire Decentering Subscale; MAAS, Mindful Attention Awareness Scale; AAQ-2, Acceptance and Action Questionnaire; SE, standard error.

Table 4. Multivariate Regression Model Using Measures of Mindfulness (EQ-D, MAAS, AAQ-2) Collectively to Predict Perceived Stress and Life Satisfaction in Matriculating PA Students (N = 294)

Variable	Estimate (B)	Standardized (B)	SE	p-value	VIF	Tolerance	Adj. R-squared
Regression Model Predicting Perceived Stress (PSS)							
EQ-D	-0.339	-0.248	0.08	<.0001	1.91	0.52	
MAAS	-0.995	-0.090	0.54	0.0695	1.36	0.73	
AAQ-2	0.484	0.501	0.06	<.0001	1.84	0.54	53.1%
Age	-0.010	-0.006	0.08	0.8913	1.06	0.94	
Gender (male)	0.180	0.010	0.80	0.8213	1.08	0.93	
Prior participation	.739	0.047	0.69	0.2838	1.06	0.94	
Regression Model Predicting Life Satisfaction (SWLS)							
EQ-D	0.185	0.191	0.06	0.0035	1.93	0.52	
MAAS	-0.314	-0.040	0.43	0.4674	1.37	0.73	
AAQ-2	-0.360	-0.522	0.04	<.0001	1.86	0.54	42.46%
Age	-0.159	-0.130	0.06	0.0069	1.05	0.95	
Gender (male)	-1.526	-0.116	0.63	0.0169	1.07	0.93	
Prior participation	0.900	-0.079	0.55	0.1011	1.06	0.94	

PA, physician assistant; PSS, Perceived Stress Scale; SWLS, Satisfaction With Life Scale; EQ-D, Experiences Questionnaire Decentering Subscale; MAAS, Mindful Attention Awareness Scale; AAQ-2, Acceptance and Action Questionnaire; SE, standard error; VIF, variance inflation factor.

Overall, findings suggest that newly matriculated PA students would be receptive to curricula designed to develop mindfulness and related abilities with the intention to improve well-being and reduce perceived stress. All survey respondents reported engaging in some form of stress reduction activity prior to entering PA school. Prior participation in specific stress reduction activities (eg, yoga, meditation) did not result in differences on well-being or mindfulness and related measures. For example, those participating in prior yoga practice did not report higher levels of mindfulness or well-being (perceived stress or life satisfaction) than those who did not practice yoga at the time of matriculation.

Nevertheless, PA students appear to have some appreciation for the value of actively managing stress. Nearly one-third of respondents (32%) identified meditation as one of their stress reduction activities, and more than half (53%) had participated in some form of mindfulness practice at least once in the past year. While prior level of engagement in mindfulness or related activities varied substantially, a majority of respondents demonstrated, at minimum, a willingness to participate in mindfulness-based practices. Although most students (64%) reported awareness of mindfulness practices at the time of matriculation, only 16% reported frequent practice within the year prior to matriculation. Consequently, by introducing structured and validated education and training tools within the curriculum to effectively increase levels of mindfulness, programs may improve overall levels of well-being among their student body.

Students who reported higher levels of mindfulness tended to also report higher levels of well-being. This finding further supports the development of reliable and structured training within curricula to effectively increase levels of mindfulness as

a means to reduce perceived stress and improve life satisfaction.

Relationship Between Well-Being and Mindfulness

There appears to be a strong relationship between higher levels of mindfulness and general well-being, a finding supported in previous research.^{6,7,14,16,17} What is more interesting, however, is that specific aspects of mindfulness appear to be differentially relevant to well-being. Decentering ability and psychological flexibility were more relevant for reported levels of life satisfaction than present moment attention and awareness ability, which does not appear to have a direct relationship with well-being. Decentering ability and psychological flexibility were also most salient in predicting perceived stress; however, present moment attention and awareness ability approached significance as a predictor. Based on the current findings, when creating wellness programs or interventions within PA education designed to foster professional resilience, consideration should be given to highlighting decentering ability and psychological flexibility.

Strengths and Limitations

This study has several strengths including the involvement of 9 PA programs from across the United States, use of validated survey items, and a response rate of 72%. Study limitations include the potential for self-report and self-selection bias present in all survey research. For example, those with stronger feelings (positive or negative) toward mindfulness may

have been more inclined to participate. Additionally, according to the most recent data available, demographics of respondents (eg, gender, age) varied slightly from the demographics of first-year PA students nationally (respondents included a slightly higher percentage of females and mean age was slightly higher), which may limit generalizability.

CONCLUSION

Overall, this study provides insight into student experiences with mindfulness and other stress reduction activities prior to entering PA school. Research findings also provide information about which aspects of mindfulness are associated with wellness. This knowledge may provide a foundation for designing curricular interventions to prioritize self-care for medical learners. Consequently, in addition to serving as a basis for monitoring the impact of interventions designed to promote student well-being, study findings provide a foundation for development of mindfulness-based activities likely to be effective in promoting student well-being during the course of PA education.

Eve B. Hoover, DMSc, MS, PA-C, is an associate professor in the Physician Assistant Program at Midwestern University in Glendale, Arizona.

Bhupin Butaney, PhD, is an associate professor in the Clinical Psychology Program at Midwestern University in Glendale, Arizona.

Susan LeLacheur, DrPH, PA-C, is a professor in the Physician Assistant Program at George Washington University School of Medicine and Health Sciences in Washington, DC.

Howard Straker, EdD, MPH, PA-C, is a professor in the Physician Assistant Program at George Washington University School of Medicine and Health Sciences in Washington, DC.

Kari Bernard, PhD, PA-C, is the associate director of research and capstone activities at A.T. Still University and a child and adolescent psychiatry PA in Anchorage, Alaska.

Bettie Coplan, PhD, PA-C, is an assistant professor in the Physician Assistant Program at Northern Arizona University in Phoenix, Arizona.

Candra Carr, MS, PA-C, is an assistant professor in the Physician Assistant Program at California State University Monterey Bay in Seaside, California.

Laura Blesse-Hampton, MS, PA-C, is an assistant professor in the Physician Assistant Program at Baldwin Wallace University in Berea, Ohio.

Amee Naidu, MMS, PA-C, is the associate program director of Student Affairs, MEDEX Northwest—University of Washington, Seattle, Washington.

Correspondence should be addressed to: Eve B. Hoover, Midwestern University Physician Assistant Program, 19555 North 59th Avenue, Glendale, AZ 85308. Telephone: 623-572-3741; Email: ehoove@midwestern.edu.

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