BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

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ABSTRACT

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BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

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Burnout, a negative psychological response to chronic work stress, has become a popular topic in recent years. While there is an abundance of research on burnout in physicians and nurses, the literature on burnout in physical therapists (PTs) is far more limited, with minimal research including PT students. Assessing burnout in PT students is an important first step toward taking action to address burnout.

The purpose of the three studies was to assess the reliability and validity of the Oldenburg Burnout Inventory for Students (OLBI-S), determine the levels of burnout in PT students, investigate factors that may influence the development of burnout, and assess students' perceptions of burnout and well-being while they are enrolled in a Doctor of Physical Therapy (DPT) program.

Test-retest reliability of the OLBI-S and convergent validity of the OLBI-S with the Maslach Burnout Inventory General Survey for Students (MBI-GSS) was assessed in DPT students. Results indicated that the OLBI-S has excellent reliability and good validity. Next, a cross-sectional study utilizing the OLBI-S and other outcome measures was conducted to determine if there is a difference in burnout scores among students in different years of a DPT program, to determine cut-off scores to group students into burnout categories, and to determine which factors may influence the development of

burnout. There was not a significant difference in burnout scores when comparing students across years in a DPT program and cut-off scores for burnout groups were established for DPT students. Results indicated that perceived stress, resilience, satisfaction with support from faculty, and satisfaction with the overall learning environment at DPT school may influence the development of burnout in DPT students.

A final study explored DPT students' perceptions of factors that impact well-being during their DPT program. This qualitative study utilized individual interviews and coding of student responses to questions. Findings indicated that DPT students experienced burnout as a combination of exhaustion, disengagement, and chronic overload. Factors that negatively affected well-being while in DPT school included unmanageable stress, an excessive workload, and time pressures. Factors that positively affected well-being while in DPT school included prioritizing time, support, and self-awareness.

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CHAPTER I

BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

INTRODUCTION

Burnout is a psychological response to chronic work stress.[1,2] It has become an increasingly popular topic of discussion in recent years as health care providers and students are pushed to capacity with increasing expectations and decreasing resources. As of May 2019, burnout is officially recognized by the World Health Organization as an occupational phenomenon.[3] Although burnout is considered to be related to work, the concept may be applied to groups doing work-like activities outside the occupational context that are structured, directed towards specific goals, and are psychologically similar to work, such as students or athletes.[4]

Burnout has many negative consequences for the person, their employer or school, and their patients. Burnout in health care professionals is associated with an increase in self-perceived errors related to patient safety.[5] It is associated with increased irritability, anxiety, guilt, feelings of helplessness, and anger.[6] Additional consequences include deterioration of psychological, physiological, and cognitive functions, low morale, low productivity, absenteeism, job turnover, and alcohol or drug abuse.[7] Burnout has considerable overlap with depressive symptoms and may be a possible precursor to depression.[5,8] Burnout has been shown to affect academic performance, mental health, and quality of life, and students who experience burnout may be more likely to exhibit unprofessional behavior.[9]

In 2014, Bodenheimer et al proposed the concept of the Quadruple Aim of health care, keeping the original goals of the Triple Aim (enhancing patient experience, improving population health, and reducing costs) while adding a fourth goal: improving the work life of health care providers.[10] Managing burnout is a main goal mentioned by the authors to address the fourth aim and is necessary to improve the work life of health care providers.[10]

While there is an abundance of research on burnout in physicians and nurses, the literature on burnout in physical therapists (PTs) is far more limited. Existing studies have been conducted with PTs in Poland,[7,11–14] Italy,[15] Spain,[16] Australia,[17] and the United States.[18–23] While few studies have been conducted on burnout in PTs, even fewer have included PT students.[24,25] PT student burnout is difficult to address when the prevalence is unknown and few outcome measures exist to study burnout in students.

The majority of studies on burnout in all populations have used some version of the Maslach Burnout Inventory (MBI), an outcome measure created in 1981 that was built on the concept that burnout is a multidimensional construct that involves three distinct but related aspects: emotional exhaustion, depersonalization, and reduced personal accomplishment.[26] Recently, the MBI has been criticized due to issues with the measure including its three factor structure and the unidirectional wording of questions.[2] There are inconsistencies with cutoff scores and burnout definitions using the MBI.[27] The MBI is also protected by copyright and distributed by a commercial publisher at a cost, while other burnout measures are free to use.

Several outcome measures have been developed in response to the criticisms and psychometric limitations of the MBI, including the Oldenburg Burnout Inventory (OLBI).[1] The OLBI measures feelings of exhaustion and disengagement from work and includes both negatively and positively worded items for each dimension.[28] The OLBI was translated into English in 2005 by Halbesleben et al who also established construct validity of the English version.[1] A student version of the OLBI (OLBI-S) was developed by Reis et al.[29] The OLBI-S was chosen for this project because not only is it free to use, it includes positively worded items for assessing the opposite of burnout: engagement.[30] Engagement is defined as a positive, fulfilling, and work-related state of mind characterized by vigor, dedication, and absorption. Engagement is often used as a proxy for well-being, and interventions are aimed at the critical factors contributing to burnout in order to foster an improved state of well-being.[31] Measuring an aspect of optimal functioning is part of the emerging trend of positive psychology first mentioned by Seligman and Csikszentmihalyi in 2000.[30,32] The authors argue that exclusive attention to pathology neglects the fulfilled individual and the thriving community, and that the aim of positive psychology is to change the focus from preoccupation with repairing the worst things in life to also building positive qualities.[32]

Assessing burnout in PT students is an important first step toward taking action to prevent and address burnout and improve their well-being. Data gathered from self-assessment instruments given at regular intervals can provide organizations and programs with critical information about which areas to focus attention and resources.[33] Health care organizations and schools should also develop and track indicators of burnout and

associated stressors that may lead to burnout.[34] When measuring the different aspects of learner well-being, organizations should use validated measurement tools, ensure the protection of confidentiality, obtain consent, promote transparency and honesty in reporting, and evaluate well-being as part of broader learning environment assessments.[31,33,35]

In order to address burnout and improve well-being, it is important to determine what factors may influence the development of burnout or which factors may protect against the development of burnout. In medical students, factors within the learning and work environment, rather than individual attributes, have been found to be the major drivers of burnout.[36–38] In a 2017 systematic review and meta-analysis on burnout interventions for physicians, organization-directed interventions had significantly larger positive effects compared to physician-directed interventions.[39] Organization-directed interventions are often more expensive and time-consuming to implement, and most studies have been conducted on individual level interventions for burnout in medical populations.[31] Common individual interventions target clinician mindfulness, physical activity/exercise, coping strategies, and resiliency.[31,39,40] It is unknown which individual level or environmental level factors may be most influential in the development of burnout in PT students.

PURPOSE

The purposes of this dissertation were to 1) determine the levels of burnout in PT students, 2) investigate individual and environmental factors that may influence the development of burnout, and 3) assess students' perceptions of burnout and well-being

while they are enrolled in a Doctor of Physical Therapy (DPT) program. Prevention and management of burnout in this student population may help reduce the development of burnout later in their work life and may help achieve the Quadruple Aim. There were three studies in this dissertation. The first study assessed test-retest reliability of the student version of the OLBI (OLBI-S) and convergent validity of the OLBI-S with the current gold standard, the MBI. The OLBI had been validated in a working population, but the student version had not yet been validated in English. The second study was cross-sectional and assessed levels of burnout in DPT students in the United States as well as which personal and environment factors were associated with the development of burnout in DPT students. The second study utilized the OLBI-S to measure burnout since it was found to be reliable and valid by the first study. The third study employed a qualitative design and explored DPT students' perceptions of factors contributing to their burnout and well-being while they were enrolled in a DPT curriculum. Approval for the studies was obtained through the Institutional Review Board of Texas Woman's University.

STUDY 1: RELIABILITY AND VALIDITY OF THE STUDENT VERSION OF THE OLDENBURG BURNOUT INVENTORY IN PHYSICAL THERAPIST STUDENTS

Specific Aim and Hypotheses

This study assessed the test-retest reliability of the OLBI-S and convergent validity of the OLBI-S with the MBI General Survey for Students (MBI-GSS). It was hypothesized that the OLBI-S would have acceptable levels of reliability and validity with correlations of .5 or greater.

Participants

An *a priori* power analysis for intraclass correlation coefficients (ICC) with power = .8, alpha level = .05, and ICC value = .7 revealed a sample size of 10 participants was needed.[41] Participants included a convenience sample of DPT students who attended Texas Woman's University in Houston during the fall semester of 2020. Students were recruited via email until a sample size of 50 was reached.

Instrumentation

Outcome measures that were utilized included the OLBI-S and MBI-GSS. The OLBI-S had two subscales: exhaustion and disengagement. Each 8-item subscale had four positively and four negatively worded questions, and after reverse scoring negative items, scores for the eight items for each subscale were averaged together. It was scored on a 5-point, Likert-type scale from strongly agree (1) to strongly disagree (5) with higher scores indicating a higher level of burnout. Both the exhaustion (Cronbach's α = .87) and the disengagement (Cronbach's α = .81) subscales were found to be reliable.[29] The MBI-GSS was a 16-item measure with three subscales: exhaustion (five items), cynicism (five items), and professional efficacy (six items).[42] It was graded on a 7-point Likert-type scale from never (0) to every day (6). The MBI was considered the standard tool for burnout research and the student version has been validated in many populations.[30,43–45]

Procedures

Students were asked to complete the OLBI-S and MBI-GSS using the Psychdata platform. They were then asked to complete the OLBI-S a second time one week later.

Intraclass correlation coefficients (two-way random effects model, absolute agreement) were calculated to examine test-retest reliability. A Bland-Altman plot was constructed, plotting individual differences against individual mean scores. The significance level was set at .05. Convergent validity was assessed by calculating Pearson's correlations comparing the exhaustion subscales for the OLBI-S and MBI-GSS and comparing the disengagement subscale of the OLBI-S and cynicism subscale of the MBI-GSS.

STUDY 2: LEVELS OF BURNOUT AND ASSOCIATED FACTORS IN THE DEVELOPMENT OF BURNOUT IN PHYSICAL THERAPIST STUDENTS

This was a cross-sectional study designed to assess the burnout scores and distribution among burnout groups (see Tables 1.1 and 1.2) for different classes of DPT students by graduate year (first-, second-, and third-year students) as well as assess which individual and environmental factors were associated with the development of burnout in DPT students.

Specific Aims and Hypotheses

The first specific aim of this study was to determine if there was a difference in burnout scores among students in different years of a DPT program; the research hypothesis was that burnout scores would be significantly different among years in a DPT program. The second specific aim was to determine cut-off scores that would be used to group students into burnout categories described by Williams et al.[25] The third specific aim was to determine which individual and environmental factors might influence the development of burnout.

Participants

While some logistic regression sample size guidelines are based on the rule of event per variable, Bujang et al report that a minimum sample size of 500 is necessary to derive the statistics that are nearly representative of the true values in the targeted population.[46] According to data obtained from the Commission on Accreditation of Physical Therapy Education, there were more than 34 000 DPT students from 256 accredited DPT programs in 2019.[47] The principal investigator (PI) recruited as many DPT students as possible from all DPT programs in the United States with a goal of at least 500 students.

Instrumentation

The outcome measure to assess burnout was the OLBI-S since it was found to be reliable and valid by the first study (if it was not, the MBI-GSS would have been used). In addition, physical activity, resilience, and perceived stress were measured. Physical activity was measured using the Saltin-Grimby Physical Activity Level Scale (SGPALS), a 1-item, 4-level scale ranging from physically inactive to regular hard physical training for competitive sports.[48–50] Resilience was measured using the 10-item Connor-Davidson Resilience Scale (CD-RISC). The 10-item scale was an abridged version of the original 25-item scale and was found to have good internal consistency (Cronbach's alpha = .85) and construct validity.[51] Perceived stress was measured using the 10-item Perceived Stress Scale (PSS). The 10-item PSS was found to have superior psychometric properties when compared with the 4-item and 14-item versions.[52]

Procedures

An email request was sent out to all Directors of Clinical Education (DCE) for each DPT program in the United States requesting that they send a recruitment email to their DPT students that included the Psychdata survey link. A reminder email was sent one week after the initial email request. The Psychdata survey included demographic questions, OLBI-S, SGPALS, 10-item CD-RISC, and 10-item PSS. The outcome measures appeared separately with their original instructions to maintain the integrity of each outcome measure. Students who completed the survey were given the option of providing their email address to the PI if they were willing to participate in a follow-up qualitative study (Study 3), which would explore their perceptions on burnout and well-being.

To test the hypothesis of the first specific aim of this study that burnout levels would be different among students in different years in a DPT program, a 2x3 independent ANOVA was conducted comparing the two OLBI-S subscales (exhaustion and disengagement) with year in a DPT program (first, second, third). Bonferroni post-hoc testing for significant main effects would have been performed if an ANOVA was found to be significant. To complete the second specific aim to determine cut-off scores that were used to group students into one of four categories (Burnout, Exhaustion, Disengagement, and Non-Burnout), cut-off scores were determined as described by Williams et al in Table 1.1 and then students were categorized into groups based on their score severity as described in Table 1.2.[25]

Table 1.1. OLBI-S Score Severity

	Exhaustion Scores	Disengagement Scores
High (Top Quartile)	> Q3	> Q3
Average (Middle Quartiles)	Q1 – Q3	Q1 – Q3
Low (Bottom Quartile)	< Q1	< Q1

Table 1.2. Burnout Groups

	Exhaustion Scores	Disengagement Scores
Burnout Group	High	High
Exhausted Group	High	Low or Average
Disengaged Group	Low or Average	High
Non-Burnout Group	Low or Average	Low or Average

To test the hypothesis of the third specific aim that different individual and environmental factors may be associated with the development of burnout, the DPT students were first dichotomized into two groups: those with burnout (the burnout group as described in Table 1.2, with both high exhaustion and high disengagement scores) and those without burnout (all other students). As a primary analysis, simple logistic regression was conducted for each individual and environmental factor from the Psychdata survey to determine which factors might have had a significant influence on burnout group category (burnout or non-burnout). An alpha level of $\alpha = .05$ was used for the primary analysis as the study was exploratory in nature. Factors that were found to be significant in the primary analysis were then entered into a multivariate logistic regression. An alpha level of $\alpha = .0125$ was used for the multivariate analysis to reduce the probability of type I error. Odds ratios and confidence intervals were reported for the factors entered into the multivariate analysis, which identified factors that had the greatest influence on the development of burnout. Results from the multivariate analysis

were also used to formulate an equation to predict which students may be at risk for developing burnout.

STUDY 3: FACTORS CONTRIBUTING TO BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

This study utilized a qualitative research design using individual interviews and coding of student responses to questions to assess DPT student perceptions on burnout and well-being.

Specific Aim and Research Question

The aims of this study were to explore DPT students' perceptions of factors that promoted or impeded well-being during their DPT program as well as to explore the students' definition of well-being. The research question was "What are DPT students' perceptions of burnout and well-being?"

Participants

Physical therapist students were recruited via convenience sampling from those who volunteered through the Psychdata survey from Study 2. Students who volunteered to participate in the qualitative portion were stratified by group (burnout and non-burnout from Study 2) and geographic region. Once stratified, students were randomized using Microsoft Excel. Students were selected in the order that they were randomized and were contacted via email to set up an interview time. If students did not wish to participate, did not answer the email, or did not answer the interview call, the next student on the randomized list was contacted. This method continued until 20 interviews were conducted. If data saturation was not reached after 20 interviews, more interviews may have been conducted.

Instrumentation

The PI conducted semi-structured interviews with participants using Zoom (audio only) to call participants. Interview prompts were modified from those used by Ratanawongsa et al with physician residents.[53] The interviews were audio-recorded and transcribed by the PI at a later date. Each participant was emailed a copy of the transcribed interview to review for accuracy and was asked to return the review within two weeks. Recorded interviews and transcriptions were stored on a password-protected computer in a password-protected file.

Data Analysis

Using a grounded theory approach, the PI coded interview notes and transcriptions to determine themes using NVivo 12 Pro. Interview responses were reviewed throughout the process to assess for data saturation. To improve rigor, the PI used reflective journaling and constant comparative analysis throughout the data collection process. Coding and themes were reviewed by two other researchers with experience with qualitative research until a consensus was reached.

CHAPTER II

BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS: A LITERATURE REVIEW

METHODOLOGY OF REVIEW

A series of reviews of literature occurred during the years 2019-2021 and included research studies that discussed burnout, including but not limited to foundational research, burnout outcome measures, causes and factors contributing to burnout, effects of burnout, and interventions to address burnout. A final, in-depth literature review was conducted to ensure all relevant articles were included. To find the most appropriate articles for this study, the following databases were used: Scopus, CINAHL Complete, PubMed, and PsycINFO. Google Scholar and other secondary references were also reviewed. The key words used to search the literature included a combination of the following: “burnout,” “physical therapy,” “students,” “outcome measure.”

After reviewing the literature, a total of 112 references were used. All articles included in this literature review were available in English. Also included in this literature review were some studies with populations other than PT students, including physicians, nurses, other graduate students, and other health care providers.

INTRODUCTION TO BURNOUT

Initial research on burnout was conducted by Freudenberger in 1974 and Maslach in 1976.[1] Burnout is often described by metaphors such as the draining of energy, the smothering of a fire, or the extinguishing of a candle; it implies that once a fire was

burning but the fire cannot continue burning brightly unless there are sufficient resources that keep being replenished.[2] Burnout is more than just fatigue and was initially defined by Maslach as "a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people in some capacity."[3] Over the years, the concept of burnout has come to include more than just those who do "people work" and pertains to other occupations, including groups doing work-like activities outside the occupational context that are structured, directed towards specific goals, and are psychologically similar to work, such as students or athletes.[4]

In May 2019, burnout was officially recognized by the World Health Organization, which defined burnout as:

> A syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy. Burnout refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life.[5]

The number of dimensions of burnout has been a source of debate for years. Several researchers argue that exhaustion is the hallmark of burnout.[6–8] Other researchers feel that reducing burnout to mere exhaustion is like "putting new wine (burnout) into old bottles (workplace fatigue)."[2,4] Still others feel that exhaustion and

cynicism/disengagement are the core of burnout and that the personal accomplishment/professional efficacy dimension is a separate personality factor or an artifact.[2,9,10]

Burnout is often characterized as having three dimensions likely because of the widely used outcome measure called the MBI, first created in 1981 by Christina Maslach and colleagues, with the three dimensions of emotional exhaustion, depersonalization, and reduced personal accomplishment.[1] In the late 1990s the MBI was found to have been applied in more than 90% of all empirical burnout studies.[11] In a more recent systematic review assessing burnout in physicians, some version of the MBI was used in over 85% of the included studies.[12] Other outcome measures have been developed in response to criticisms of the MBI, including the OLBI,[13] the Copenhagen Burnout Inventory (CBI),[6] the Burnout Measure (BM),[7] and the Shirom-Melamed Burnout Measure (SMBM).[8] The MBI and OLBI also have student versions.[9,14]

In summary, burnout is a psychological response to chronic workplace stress and is characterized by exhaustion as well as depersonalization or disengagement.[4,10,15,16] Exhaustion is defined as a consequence of intensive physical, affective, and cognitive strain as a long-term consequence of prolonged exposure to certain job demands, while disengagement refers to distancing oneself from one's work and experiencing negative attitudes toward the work object, work content, or one's work in general.[13] Using the job demands-resources model, high or unfavorable job demands are primarily related to exhaustion, while a lack of job resources is primarily related to disengagement.[15] Women may be more likely to experience emotional exhaustion, where men may be more likely

to experience depersonalization or disengagement.[17] In physicians, women may be 20-60% more likely to develop burnout.[18] Burnout is the result of a chronic ongoing reaction to one's work and a negative affective response to prolonged impairing stress.[19,20] Burnout is different from temporary states like fatigue (which can decrease with adequate rest) or boredom (which can decrease with a change in task or activity) as burnout is not immediately reversible after changes in tasks or the working conditions.[20] Burnout follows a developmental process that might begin during students' academic studies and follows them as they transition into the work force, making burnout an important subject to investigate in students in order to mitigate or prevent its effects well into the beginning of their professional life.[9,21]

Contributing Factors in the Development of Burnout

The gradual development of burnout is a dynamic and complex process that is influenced by numerous factors. In PTs these factors may include, but are not limited to, prolonged exposure to stress, lack of professional autonomy, poor work organization, lack of equipment and staff, insufficient time to complete work, insufficient salary, high work demands, lack of support and help from others, low job satisfaction, working with patients with chronic conditions, role conflict or ambiguity, physical inactivity, interprofessional conflicts, perception of no control over policy making, lack of opportunity for career advancement, stressful marital life, poor professional preparation, lack of sharing and feedback, lack of faith in superiors, low self-esteem, unpleasant work environment, lack of a personal life outside of work, and increased productivity expectations.[22–32]

There is conflicting evidence regarding years of experience and burnout risk in PTs as some studies suggest that those with less than 5 years of experience were at a higher risk for burnout,[25,33] while other studies suggest that those with greater than 15 years of experience had a higher burnout risk.[26,29] It is possible that the results of both studies are true; the risk of developing burnout may be greater during the first few years of working, may decline between 5 and 15 years of experience, and then may increase again in those with greater than 15 years of experience. In a study by Williams et al conducted to measure and quantify the changes in emotional distress, academic burnout, perception of general health status, and use of coping behaviors reported by doctoral level physical therapy graduate students over the course of one academic semester, students age 29 years and older (22%, or 35 out of 163 students surveyed) reported significantly higher distress and burnout, possibly because they were returning to school after time off or making a career change.[34]

Levels of leisure-time physical activity appear to affect the development of burnout. In a 2014 study where Swedish health care workers were assessed four times over a period of 6 years, those who increased their physical activity levels were less depressed, less anxious, and experienced less burnout.[35] In a 2017 study by Dyrbye et al, medical students whose aerobic exercise and/or strength training habits were consistent with Centers for Disease Control and Prevention (CDC) guidelines were less likely to experience burnout and had a higher quality of life.[36]

Mindset may also be a contributing factor in the development of burnout in students. In an article by Slavin, a series of potentially destructive mindsets in medical

students are described, including: viewing performance as identity rather than just performance, defining one's self-worth in comparison to the academic performance of peers, maladaptive perfectionism, impostor syndrome, cognitive distortions (catastrophization, all-or-nothing thinking, overgeneralization, and predicting the future with certainty), feelings of inadequacy, embarrassment, and shame related to academic performance, and chasing success in a singular, unhealthy way.[37] Other individual factors that may contribute to development of burnout in students include a low level of social support, not experiencing positive life events, higher levels of fatigue, higher levels of stress, and being a non-minority.[21,38–41]

In the study conducted by Dyrby et al, students were asked to classify themselves as Caucasian (the non-minority group) or African American, Hispanic, Asian, Native American, Pacific Islander, or other non-Caucasian (together considered the minority group).[41] More non-minority students had burnout compared to minority students, though minority students reporting that their race/ethnicity had adversely affected their medical school experience were more likely to have burnout, depressive symptoms, and low mental quality of life scores than were minority students without such experiences.

While burnout interventions for medical students are often targeting individual factors, several authors have written that factors within the learning and work environment, rather than individual attributes, are the major drivers of burnout.[38–40] Grading scheme and perceptions of the learning environment have been shown to be the most influential on medical students' well-being.[38,40,42,43] In a study by Reed et al with 1,192 first- and second-year medical students, there was a significant association between

grading scales and measures of student well-being.[43] Compared to the 701 students who attended schools using a pass/fail grading scheme, the 491 students who attended schools using grading scales with three or more categories (eg, honors/pass/fail, honors/high pass/pass/marginal pass/fail) had higher levels of stress, depersonalization, emotional exhaustion, and burnout, and they also were more likely to have seriously considered dropping out of school.[43] In a study by Dyrbye et al, medical students who had increased satisfaction with the learning environment and greater agreement that student education is a priority for faculty members were significantly more resilient against the development of burnout.[40]

Several authors have written that curricular and clinical hours do not seem to contribute to the development of burnout.[38] In a study by Reed et al with first- and second-year medical students, there were no significant associations between total contact days or the percentage of time spent in didactic learning and clinical experiences and any measures of student well-being.[43] In a study with third- and fourth-year medical students, no relationship was found between clinical rotation characteristics and workload (eg, outpatients, inpatients, intensive care unit, overnight call frequency, and number of patients seen per day or admitted per week) and burnout.[39]

Negative Effects of Burnout in Health Care Providers

Burnout in health care providers has many negative consequences for the person, their employer, their coworkers, and patients. Burnout risk is associated with increased self-perceived errors related to patient safety.[44] It is associated with irritability, anxiety, guilt, feelings of helplessness, and anger.[45] Additional consequences include deterioration

of psychological, physiological, and cognitive functions, low morale, low productivity, absenteeism, job turnover, and alcohol or drug abuse.[46] Burnout has considerable overlap with depressive symptoms, and Fahrenkopf et al found that 96% of depressed physician residents were also burnt-out, but only 25% of burnt-out residents were depressed, indicating that burnout may be a possible precursor to depression.[44,47] Manifestations of large-scale burnout within an organization include high levels of absenteeism, high staff turnover, increased filing of grievances, and returning to school or entering administrative posts rather than continue to treat patients.[22]

Promoting the Opposite of Burnout: Improving the Well-Being of the Health Care Work Force

Two landmark reports led to major changes in the design of health care work systems and processes to improve quality of care and reduce preventable patient harm: *To Err Is Human: Building a Safer Health System* in 1999 and *Crossing the Quality Chasm: A New Health System for the 21st Century* in 2001. In 2019, the report *Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being* was written as a follow-up to these reports and calls attention to the safety, health, and well-being of health care clinicians.[42] The Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being, formed by members of the National Academies of Sciences, Engineering, and Medicine, analyzed current available evidence and created the following six goals for eliminating clinician burnout and enhancing professional well-being:

1. Create Positive Work Environments: Transform health care work systems by creating positive work environments that prevent and reduce burnout, foster professional well-being, and support quality care.
2. Create Positive Learning Environments: Transform health professions education and training to optimize learning environments that prevent and reduce burnout and foster professional well-being.
3. Reduce Administrative Burden: Prevent and reduce the negative consequences on clinicians' professional well-being that result from laws, regulations, policies, and standards promulgated by health care policy, regulatory, and standards-setting entities, including government agencies (federal, state, and local), professional organizations, and accreditors.
4. Enable Technology Solutions: Optimize the use of health information technologies to support clinicians in providing high-quality patient care.
5. Provide Support to Clinicians and Learners: Reduce the stigma and eliminate the barriers associated with obtaining the support and services needed to prevent and alleviate burnout symptoms, facilitate recovery from burnout, and foster professional well-being among learners and practicing clinicians.
6. Invest in Research: Provide dedicated funding for research on clinician professional well-being.

While all of the above goals affect health care students, goals 2 and 5 are specific to students. The National Academies of Sciences, Engineering, and Medicine expanded on goal 2 by stating that health professions educational institutions, affiliated clinical

training sites, accreditors, and related external organizations have a responsibility to create and maintain positive learning environments that support the professional development and well-being of students and trainees.[42] They summarized a variety of recommendations to achieve this goal, including:

1. Designating a leadership role and function responsible for improving and sustaining learner professional well-being across the organization and across the continuum of learners.
2. Creating systems of learner evaluation that fairly evaluate competencies while mitigating undue stress and promoting a collaborative learning environment, including criterion-based grading and a consideration of pass-fail grading.
3. Providing resources for learners to promote and support their own personal and professional well-being.
4. Using validated measurement tools to assess the extent of the burnout problem and the potential contributory factors.
5. Assessing the total clinical and academic workload expected of learners with the goal of achieving a reasonable workload that is sustainable.
6. Conducting annual reporting on the professional well-being of its learners, including the outcomes of interventions taken to improve learner professional well-being.
7. Using data to guide systems-oriented efforts to prevent and reduce learner burnout and improve professional well-being.

Worker well-being is defined as "an integrative concept that characterizes quality of life with respect to an individual's health and work-related environmental, organizational, and psychosocial factors," and although professional well-being can be measured by a variety of indicators, work engagement has been a common proxy for professional well-being.[42] Engagement is thought to be on the opposite end on the spectrum from burnout and is defined as a positive, fulfilling, and work-related state of mind characterized by vigor, dedication, and absorption.[14] Measuring an aspect of optimal functioning is part of the emerging trend of positive psychology first mentioned by Seligman and Csikszentmihalyi in 2000.[14,48] The authors argue that exclusive attention to pathology neglects the fulfilled individual and the thriving community, and that the aim of positive psychology is to change the focus from preoccupation with repairing the worst things in life to also building positive qualities.[48]

In 2014, Bodenheimer et al proposed the concept of the Quadruple Aim of health care, keeping the original goals of the Triple Aim (enhancing patient experience, improving population health, and reducing costs) while adding a fourth goal: improving the work life of health care providers.[49] Managing burnout was a main goal mentioned by the authors to address the fourth aim and is necessary to improve the work life of health care providers. Working to prevent and manage burnout in the student population may help reduce the development of burnout later in their work life and may help achieve the Quadruple Aim by improving clinician well-being and engagement.

BURNOUT IN PHYSICAL THERAPISTS

While there is an abundance of research on burnout in physicians and nurses, the literature on burnout in PTs is far more limited. Burnout in PTs was first discussed in the literature by Wolfe in 1981, who outlined factors in the development of burnout, signs and symptoms of burnout in PTs, and ideas to combat burnout.[22] He mentions a combination of personal and environmental factors that could contribute to the development of burnout, including a highly motivated personality type (who may increase their efforts when confronted by frustration or work overload), unrealistic expectations for the patient (which could lead to a sense of failure and frustration), quantitative overload (understaffed departments, a high proportion of chronically ill patients, lack of time to treat patients adequately), qualitative underload (boredom, lack of a career ladder allowing for increased responsibility and remuneration for increased skills), and role conflict or ambiguity (such as being placed in a situation with incompatible demands). Some symptoms of burnout in PTs mentioned by Wolfe include increased work effort coupled with no increase in productivity, fatigue and distancing behaviors, drawing sharp boundaries between outside interests and work (compartmentalization), displaying an increased rigidity, and a tendency to "go by the book" in all situations (eliminating the need for personal decisions by the individual and shifting responsibility to the organization). While this was the first article to mention burnout in PTs, it was a commentary and did not attempt to assess or measure burnout.

Studies on PT burnout have been conducted in Poland,[24,26,29,46,50] Italy,[51] Spain,[52] Australia,[33] and the United States.[25,27,28,31,32,53,54] Similar to other studies, the studies on

burnout in PTs had varying definitions of burnout and prevalence of burnout and a majority of the studies used some version of the MBI. Cutoff scores for what was considered burnout varied. Several articles reported only means and standard deviations of the three subscales, while other articles used cutoff scores and reported the burnout risk for each subscale. Some articles reported only percentages, stating what percent of the participants had a low, average, or high risk of burnout for each subscale. Finally, some articles combined the three subscales into one overall burnout score, which the MBI manual specifically states not to do.[55] It is difficult to make comparisons when the methods are heterogenous.

Another limitation of existing burnout studies in PTs is the difficulty with generalizability of results. Many of the studies that have been published have small sample sizes and were conducted in specific regions or on a specific subset of PTs. For example, in the United States, studies have been done in the Pacific Northwest,[28] the East North Central region (including Illinois, Indiana, Michigan, Ohio, and Wisconsin),[25] New York City,[32] Massachusetts,[31] and Missouri.[54] Only two studies were conducted nationwide, but only surveyed members of the American Physical Therapy Association (APTA).[27,53] The studies conducted in the United States are summarized below.

A 1984 article by Schuster et al was the first to report the prevalence of burnout in PTs in the United States.[27] The authors surveyed 250 APTA members via mail, receiving 160 surveys that fit inclusion criteria. The survey included demographic questions as well as a 52-item questionnaire devised by one of the authors that assessed potential symptoms, organizational causes, and personal causes of burnout. Fifty-three percent of

those that fit inclusion criteria identified themselves as experiencing feelings of burnout. Multiple regression was performed on each of the five dependent variables (symptoms of burnout) as predicted by the eight potential causes of burnout. The authors found that lack of professional sharing and feedback and lack of faith in supervisors were significant predictors of negative attitudes toward others in the workplace. Organization dysfunction and low self-esteem were significant predictors of dissatisfaction with the workplace, and excessive demands was a significant predictor of redirection of interests away from the workplace. There were no individual significant predictors of physical and psychological reactions, but the eight independent variables were significant predictors when combined. There were no individual or combined significant predictors of avoidance responses. At the time this study was conducted, PT education was at the undergraduate level and reimbursement rates and productivity requirements were vastly different than they are today.

In 1989, Deckard and Present conducted a study to examine the relationship between role stress and physical and emotional well-being in 187 PTs practicing in Missouri.[54] The authors utilized the role conflict and role ambiguity scales, the MBI, and the Anxiety-Stress Questionnaire. They found a significant relationship between role conflict (conflict between organizational demands and personal and professional values) and emotional exhaustion (r = .50), somatic tension (r = .43), and job-induced tension (r = .44). Role ambiguity (created by an uncertain organizational climate) had a significant relationship with emotional exhaustion (r = .26), somatic tension (r = .21), and job-induced tension (r = .29). Significant role stressors that were found to be predictors of

decreased emotional and physical well-being included perceived improper allocation of time, inadequate staff or resources, and incompatible demands.

A 1993 article by Donohoe et al surveyed 122 PTs in inpatient rehabilitation hospitals in Massachusetts to determine factors associated with burnout. The survey included demographic questions, the MBI, and a 25-question instrument created by the authors addressing personality and work environment issues. Most of the therapists surveyed had 3 years or less of experience (63%) and a bachelor's degree (82%). None of the respondents had a doctoral degree, though 10% had an entry-level master's degree, 4% had an associate's degree, and 4% had an advanced master's degree. Forty-six percent of the therapists reported high emotional exhaustion, 20% reported high depersonalization, and 60% reported low personal accomplishment. The authors performed a factor analysis on their own 25-question instrument and reported dropping 6 items from the survey, but they did not publish the instrument questions or which items were dropped. The three factors that emerged (communication/connectedness, achievement, and time constraints) were significant predictors of emotional exhaustion. The communication/connectedness factor and achievement factor were significant predictors of depersonalization and negative predictors of personal accomplishment, but they did not help the authors distinguish between personality factors and environmental factors as they contained a combination of both factors.

A 1995 study by Schlenz et al investigated the relationship between burnout and the professional development activities of 21 occupational therapists and 19 PTs working in head injury rehabilitation in the Pacific Northwest region of the United States.[28] The

therapists completed a survey that included the MBI as well as an additional survey developed by the authors to gather information regarding professional development activities, including professional title, professional memberships, career advancement opportunities, in-service education opportunities, mentoring experience, number of continuing education activities, percentage of employer funding for continuing education, and number of continuing education presentations given. The therapists were found to have higher emotional exhaustion, lower depersonalization, and higher personal accomplishment scores than the second edition MBI manual norm reference groups of human service professionals and medical professionals. There was little to no relationship between emotional exhaustion and professional development activities and depersonalization and professional development activities. The correlations between personal accomplishment and the professional development activities were positive for eight of the nine activities and significant for six of the nine activities.

Another regional study was conducted in 1997 by Wandling and Smith who surveyed orthopedic section members of the APTA from the east north central region (Illinois, Indiana, Michigan, Ohio, Wisconsin).[25] They received 387 completed surveys that included the MBI and demographic information. The therapists in this study had lower burnout subscale scores compared to those reported in the MBI manual and those reported in studies conducted with PTs prior to 1997. Those respondents who had been in practice for more than 16 years had low emotional exhaustion subscale scores, whereas those who had been in practice for less than 5 years had the highest emotional exhaustion subscale scores. The authors caution that it is possible that orthopedic PTs that were most

burned out had no time or energy to answer the survey or were no longer members of the orthopedic section, APTA, or even the profession.

A study by Balogun et al conducted in 1998 assessed the prevalence of burnout in PTs and occupational therapists working in hospitals and clinics in New York City.[32] A total of 169 PTs and 138 occupational therapists responded to a survey that included the MBI as well as a combination of 20 open-ended and closed-ended demographic questions. The therapists in this study had higher levels of burnout compared to previous studies assessing therapist burnout, with 58% reporting high emotional exhaustion, 94% reporting high depersonalization, and 97% reporting low personal accomplishment. Few demographic factors were related to burnout subscale scores, and those that did have a statistically significant correlation were weakly correlated, with coefficients ranging from 0.112 at $p < .05$ to -0.190 at $p < .001$.

In a 2015 research platform presentation at the World Confederation for Physical Therapy Congress, Zambo Anderson et al reported results of a study using a stratified sample of 6500 PT members of the APTA who were emailed a survey that included the MBI Health Services Scale, Perceived Stress Scale, and demographic questions.[53] The authors received completed surveys back from 1366 PTs, 69% of which were female and 92% were white. Twenty-nine percent were found to have high emotional exhaustion and 15% had high perceived stress. Thirteen percent were considered to have burnout due to having high levels of emotional exhaustion and depersonalization and low levels of personal accomplishment.

BURNOUT IN PHYSICAL THERAPIST STUDENTS

There is a paucity of literature on burnout in PT students. A study by Balogun et al assessed 21 PT students in their junior year attending the State University of New York Health Science Center at Brooklyn over the course of the 1994 spring semester when PT education was at a baccalaureate level.[56] The authors used a version of the MBI that they had modified for a previous study, changing the word "work" to "studies," "instructors" to "students," and "work day" to "school day." [57] Subscales were classified as "low," "moderate," or "high" based on values reported by Maslach and Jackson in the second edition of the MBI.[55] The authors found a significant change in emotional exhaustion from a moderate level at the beginning of the semester to a high level at mid-semester and end of semester. Depersonalization scores increased from the beginning of the semester to mid-semester and end of semester, but the changes were not significant, and scores remained at the "moderate" level at all time points. Personal achievement scores also did not significantly change throughout the semester, though scores fell in the "moderate" level at beginning and end of semester and were considered at a "low" level at mid-semester.

A more recent study by Williams et al assessed 163 first and second-year students from the Northern Arizona University Doctor of Physical Therapy program (on both campuses) at the beginning and end of the spring 2016 semester.[34] Measures included the OLBI-S, the 21-item Depression, Anxiety, and Stress Scale, a 1-item question about General Health Status, and a 24-item list of coping behaviors. To interpret the calculated OLBI-S scores, frequency distributions of the mean subscale scores from the start of the

semester were divided into quartiles and grouped into “low,” “average,” and “high” scores. Students were placed in the Burnout category if they had “high” scores for both subscales, were categorized as Disengaged or Exhausted if they only had a “high” score for that particular subscale combined with a “low” or “average” score on the other scale, and finally, students were placed in the Non-Burnout category if they had “low” or “average” scores for both subscales. The authors found a significant increase in exhaustion and disengagement from the beginning of the semester to the end of the semester in both groups, with second-year students having higher exhaustion and disengagement levels compared to first-year students. The percentage of students in the Burnout category increased by 22% over the course of the semester, while the percentage of students in the Non-Burnout category decreased by 35%.

A review study by Bullock et al researched the prevalence and effect of burnout on graduate health care students, with some studies including PT students.[58] In their review the authors found that burnout rates were higher in medical students than in age matched peers and the general population and that the prevalence of burnout increases as graduate health care students progress through their respective programs. They also found that an increased prevalence of burnout was shown to affect academic performance, mental health, and quality of life of graduate health care students. Another disturbing finding was that medical students who experienced burnout were more likely to exhibit unprofessional behavior, such as self-prescribing medication and being less likely to believe they should report impairment among fellow medical students due to alcohol or substance abuse.[59] Unfortunately, the authors reported that only 26.9% of the medical

students surveyed would definitely seek professional help for mental health problems, while 44.3% of the general population and age matched peers surveyed said that they would seek professional help for the same issues.[60] While the literature review noted the difficulty of incorporating humanism and empathy into graduate health care education, the articles reviewed investigating mindfulness, self-reflection, perspective taking, role modeling, and emotional labor were proposed by the authors to be potential methods of increasing empathy, altruism, and prosocial behavior in graduate health care students.

MEASURING BURNOUT: AN ASPECT OF WELL-BEING

Assessing aspects of learner well-being can be helpful and is an important first step to making progress towards improving learner well-being. Data gathered from self-assessment instruments given at regular intervals can provide organizations and programs with just-in-time information about which areas to focus attention and resources.[61] Assessing multiple dimensions of well-being such as burnout, engagement, fatigue, professional fulfillment, stress, or quality of life allows the organization to evaluate their relationship with other key performance measures. Health care organizations should also develop and track indicators of burnout and important stressors that may lead to burnout.[62] When measuring aspects of well-being, organizations should use validated measurement tools, ensure the protection of confidentiality, obtain consent, promote transparency and honesty in reporting, and evaluate well-being as part of broader learning environment assessments.[42,61,63]

Measuring burnout can be helpful for both the organization and the clinician or learner. In a 2017 study by Holmes et al of 307 physician residents, 69% of residents met

criteria for burnout, but 92% of the 12 program directors surveyed estimated that burnout rates in their programs were 49% or less, significantly underestimating the prevalence of burnout among their residents.[64] In a 2014 study by Shanafelt et al, 1150 surgeons were given subjective and objective measures of their own well-being.[65] The physicians' ability to reliably calibrate their level of distress relative to colleagues was found to be poor as a majority of the surgeons (89.2%) believed that their well-being was at or above average, including 70.5% with scores in the bottom 30% relative to national norm. After receiving their objective feedback, 46.6% of surgeons indicated that they intended to make behavior changes. Self-assessment may help improve awareness and can also help learners more accurately self-calibrate their own well-being, which may promote health behavior change and help-seeking behavior before distress is severe.[42]

Maslach Burnout Inventory

There are several outcome measures that have been developed to measure burnout. The MBI has long been considered the gold standard outcome measure of burnout research. The first version of the MBI was created in 1981 by Christina Maslach and colleagues and characterized burnout as having three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment.[1] Emotional exhaustion describes feeling of being emotionally overextended and exhausted by one's work, depersonalization describes an unfeeling and impersonal response towards recipients of one's care or service, and personal accomplishment describes feelings of competence and successful achievement in one's work with people. Higher scores on the first two subscales and a lower score on the personal accomplishment subscale would

indicate a person is at a higher risk for burnout. Originally, burnout was thought to be a phenomenon experienced by those who did "people work" in areas such as social work, health care, and teaching. In subsequent years, several different versions and editions of the MBI were published, including those for service workers, educators, students, and a general survey.[3,14,21,55,66]

In recent years the MBI has been criticized due to several issues with the measure, including its three factor structure (emotional exhaustion, depersonalization/cynicism, reduced personal accomplishment/professional efficacy) and the unidirectional wording of questions.[16] Qiao and Schaufeli give empirical, theoretical, clinical, and psychometric evidence that the personal accomplishment/professional efficacy factor should not be included as part of the burnout construct and agree with previous authors that the core of burnout includes a mix of two factors (exhaustion and cynicism/disengagement).[4] There are often issues with cutoff scores and defining burnout using the MBI. In a 2018 systematic review looking at the prevalence of burnout in physicians, 85.7% of the articles reviewed used a version of the MBI to measure burnout. [12] Studies variably defined burnout, using at least 142 unique definitions for meeting overall burnout and using markedly different cutoff scores. Among studies using instruments based on the MBI, there were at least 47 distinct definitions of overall burnout prevalence, and overall burnout prevalence ranged from 0% to 80.5%. Rotenstein et al recommend that given the limitations in the MBI, researchers should consider using other tools. The MBI is also protected by copyright and distributed by a commercial publisher, where other burnout measures are free to use.

Oldenburg Burnout Inventory

The OLBI was developed in 2002 by Demerouti et al to address problems associated with the MBI.[20] The OLBI measures feelings of exhaustion and disengagement from work (applicable to virtually any occupation, not just "people work") and includes both negatively and positively worded items for each dimension. Exhaustion is defined as a consequence of prolonged and intense physical, affective and cognitive strain, as the result of prolonged exposure to specific working conditions (or stressors). In contrast to exhaustion as operationalized in the MBI, the OLBI covers not only affective (emotionally drained), but also physical and cognitive aspects of exhaustion (need of long resting time). Disengagement refers to emotions regarding the work task (uninteresting, no longer challenging, and "disgusting"), as well as a devaluation and mechanical execution of one's work, while the cynicism scale of the MBI General Survey (MBI-GS) restricts itself to measuring mainly subjective job meaninglessness and the lack of interest employees have in their job. Each 8-item subscale has four positively and four negatively worded questions, and after reverse scoring negative items, scores for the eight items for each subscale are averaged together. The OLBI is scored on a 5-point, Likert-type scale from strongly agree (1) to strongly disagree (5) with higher scores indicating a higher level of burnout.

The OLBI was translated into English in 2005 by Halbesleben et al who also established construct validity of the English version.[10] The authors found the internal consistency of the OLBI to be acceptable with all Cronbach's alpha scores being over .70 (scores ranged from .74-.87). For test-retest reliability, the scales were moderately

correlated (r = .51, p < .001, for exhaustion; r = .34, p < .01, for disengagement) between Time 1 and Time 2 (4 months). Factor analysis confirmed the two-factor structure of the OLBI. Finally, the OLBI had acceptable convergent and discriminant validity when compared to the MBI-GS using a multi-trait, multi-method framework.

The OLBI was adapted by Reis et al to measure academic burnout in students (OLBI-S).[9] The authors were able to replicate the two-factor model in a sample of Greek and German university students, and they confirmed factorial invariance between the two groups of students, which is important for valid comparisons across cultures. The student data was collected from students at three German universities and two Greek universities, but it is unclear if the students were in undergraduate or graduate programs. The average age of the students was 23.52 years for the German students and 23.3 years for the Greek students. Both the exhaustion (Cronbach's α = .87) and the disengagement (Cronbach's α = .81) subscales were found to be reliable. Williams et al used the OLBI-S in a study with PT students, where they divided the frequency distributions of the mean subscale scores into quartiles, which were then grouped into "low," "average," and "high" scores. The authors used these groups to categorize students in the following groups: Burnout, Disengaged, Exhausted, and Non-Burnout.[34] While the OLBI-S has been used with university students in Greece and Germany, it has not yet been validated in PT students in the United States.

Copenhagen Burnout Inventory

The CBI was developed after the initiation of the Danish longitudinal study PUMA (Danish acronym for Project on Burnout, Motivation and Job Satisfaction) in

1997.[6] The aim of PUMA was to study the prevalence and distribution of burnout, the causes and consequences of burnout, and possible interventions to reduce burnout if necessary. In connection with the PUMA study, several questionnaires were reviewed for the assessment of burnout and the authors did not find any of the available instruments to be satisfactory, including the MBI.

The CBI focuses on the exhaustion aspect of burnout and consists of three scales labeled personal burnout (the degree of physical and psychological fatigue and exhaustion experienced by the person), work-related burnout (the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work), and client-related burnout (the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work with clients). However, the CBI does not include a withdrawal dimension that is critical to the burnout construct, such as disengagement, depersonalization, or cynicism.

Burnout Measure

The BM was developed in 1981 by Pines et al as a measure to assess burnout with one single score, as opposed to the MBI that is composed of three subscales whose scores should not be combined.[7] The BM is composed of 21 items using a 7-point frequency scale, whose mean value is calculated to derive the overall score. The authors define burnout as "a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding."[67] The BM has a strong correlation with the emotional exhaustion factor of the MBI, but cannot be distinguished from psychological strain and psychosomatic complaints and captures only one aspect of

burnout.[68] The developers of the BM also feel that burnout can occur outside of the occupational realm and can be used in any context.

Shirom-Melamed Burnout Measure

The SMBM is another outcome measure focusing on the exhaustion component of burnout. The authors of the SMBM believe the burnout construct is related to individuals' feelings of physical, emotional, and cognitive exhaustion, focusing on the continuous depletion of the individuals' energetic coping resources resulting from their chronic exposure to occupational stress.[8,19] Shirom's initial writings on burnout were related to physical, emotional, and cognitive exhaustion and were based on Hobfoll's Conservation of Resources theory, whose basic tenet is that people strive to retain, protect, and build resources and that what is threatening to them is the potential or actual loss of these valued resources.[69] The SMBM has two subscales, physical fatigue and cognitive weariness, each with six items. Though the subscale scores on the SMBM can be combined unlike the MBI, it only measures the exhaustion aspect of burnout and does not include a withdrawal component.

INTERVENTIONS TO REDUCE BURNOUT AND IMPROVE WELL-BEING

In the first major article published on burnout in PTs, Wolfe states that the first step in combating burnout is for administrators and supervisors within health care organizations to recognize its existence and provide a means for open discussion of the problem.[22] While aspects of burnout may be related to factors at the individual level, many other contributing factors arise from an organizational level. Jette stated in his 2018 editorial for the *Physical Therapy Journal* that simple solutions (establishing physician

wellness programs or hiring corporate wellness officers) would not solve the dilemma because the focus is on the victim instead of the underlying problem.[70] He also stated that executives in the health care system must recognize and acknowledge that this phenomenon is not physician burnout but rather the moral injury of multiple competing allegiances that clinicians face on a daily basis. The “canary in the coal mine” metaphor appeared several times in articles discussing medical student mental health issues such as depression, anxiety, stress, and burnout.[37,70,71] Coal miners used to take canaries, who were sensitive to methane and carbon dioxide gases, into coal mines. If the canary became sick or died, it indicated dangerous environmental conditions in the coal mine. Therefore, the prevalence of mental health issues observed in students is likely a reflection of the environment and culture in academic programs.

Interventions at the Individual Level

While focusing solely on individual factors may not fix the burnout problem, they are still worth addressing. Individual factors that have been suggested that may prevent the development of burnout in PTs include support from friends and family,[22,26,28,31] adequate coping skills,[24,46,50] maximizing time away from patients to allow for recovery,[22] and regular exercise.[22,35] When feelings of frustration and failure are recognized, the therapist should attempt to identify specific causes that are contributing to those feelings rather than generalizing and indicting the "system."[22] Additional protective factors are satisfaction with work,[26] staff happiness,[26] and ability to find humor at work.[31] According to Wolfe, the most important action the individual can take to cope with burnout is to be aware of their own needs and attempt to understand why they are

working in a helping profession. Such an understanding may allow the PT to identify and curtail the impulses toward overwork that is so commonplace in the medical professions.[22]

Numerous studies have been conducted on individual-level interventions for burnout in medical populations. Common individual interventions target clinician mindfulness, physical activity/exercise, coping strategies, and resiliency.[42,72,73] Focusing on individual factors can be helpful as part of a response to unavoidable stress that is an inherent part of a health care worker's job, such as not being able to heal every patient, making life or death decisions without enough information, and dealing with adverse outcomes.[62] These are sources of unavoidable suffering, and because they cannot be prevented, the goal of health care organizations should be to minimize the harm these situations cause. Studies conducted using individual-level interventions to reduce or prevent burnout and improve well-being are summarized below.

Mindfulness

In a 2016 systematic review and meta-analysis by West et al on burnout interventions in physicians, the studies using mindfulness-based or stress management focused interventions yielded a greater burnout score reduction than the other interventions.[73] The time commitment of the interventions varied widely, from two or three 1-hour sessions,[74] to six weekly 60 to 90-minute sessions,[75,76] to eight weekly 2.5-hour sessions with an additional all day (7-hour) session.[77,78] Some interventions also included refresher courses or a maintenance phase up to 17 months after the initial training.[76,78] Results were conflicting, with some studies reporting no change in

burnout,[74,75] some reporting a significant decrease in burnout,[76,77] and one study reporting a decrease in burnout that was not apparent in the short term but developed at long-term follow up.[78] Results may be biased as many participants self-selected to take part in the mindfulness interventions and some studies had no control group for comparison.

A handful of studies have been conducted on mindfulness in PT students, but not specifically related to burnout. A 2016 exploratory study by Willgens et al looked at PTs' perceptions of mindfulness for stress reduction.[79] Eight PT students in their final 12-week clinical experience recruited 8 PTs to participate in 10 weekly mindfulness activities lasting 10-15 minutes, using an evidence-based *Mindfulness Booklet* the eight students and the PI created. The students interviewed and audio-recorded participants in week 12, then used a grounded theory approach to conduct a qualitative analysis. The data suggested that the PTs embraced mindfulness as a strategy to practice self-care. The authors recommended that mindfulness be introduced early in a physical therapy education program and should be practiced regularly to minimize student stress. Students could also utilize this evidence-based strategy to practice self-care within and outside of the clinic, as well as lead efforts to introduce mindful practice to sites as part of their clinical training.

In 2016, Chambers et al taught 24 PT students the beeja mantra-based meditation technique and asked them to practice for 20 minutes, twice daily for the 8-week study period.[80] Most students reported meditating at least once per day (91.6%). The authors found a significant reduction in perceived stress, anxiety, and blood pressure in the

students following the intervention. Study limitations include a small sample size, no control group, and no long-term follow up.

In 2019, Kindel and Rafoth conducted a randomized controlled trial on one class of 32 PT students.[81] Both groups received the usual course instruction, while the experimental group also received a 6-week mindfulness curriculum. The mindfulness curriculum included a combination of theory and experiential-based learning, including videos, short stories, poems, meditation, focused breathing, relaxation, and body scanning. Mindfulness content was taught for the first 15 minutes of a 90-minute class as an add-on and was not linked to the course topic. The authors found a statistically significant improvement in perceived stress scores of the experimental group both immediately after the intervention and at the end of the semester. Mindfulness level scores were higher in the experimental group immediately after the intervention but were not statistically significant at the end of the semester.

In a 2019 study by Willgren and Palombaro, 23 graduate students across 4 health professions (including 9 PT students) participated in a 6-week mindfulness workshop for stress management in March 2017.[82] The workshops occurred for 50 minutes each week of a winter term and included meditation, mindful movement, and small group discussion. Students were also to practice mindfulness activities for 15 minutes daily over the 6 weeks. All measures of stress improved after the 6-week workshop. After completing a clinical experience 9 months later, all students reported the tools learned in the mindfulness workshop supported their performance in the clinical setting, with 2 students reporting “the tools helped somewhat” and 21 students reporting “the tools

helped a great deal." Limitations were that the stress outcome measures were not reassessed after the clinical experiences and no burnout measures were utilized.

In a 2020 pilot study by Shearin and Brewer-Mixon, 42 health professions students from University of Texas Southwestern Medical Center at Dallas (36 first- and second-year students from the Department of Physical Therapy, and 6 first-year students from the Department of Rehabilitation Counseling) received 4 intervention sessions during the first 6 weeks of the first summer semester for the PT students and during the first 6 weeks of the first fall semester for the rehabilitation counseling students.[83] The intervention sessions consisted of in-person module presentations and written materials focusing on the practices of cognitive behavioral therapy and mindfulness, as well as lifestyle management and study tips. The authors provided a summary of the content of each session, but the modules and other materials were not provided. Small but statistically significant decreases were found in students' reported levels of anxiety, depression, stress, and overall distress. This study did not include a control group, did not assess at any later semester, and did not assess burnout.

Physical Activity/Exercise

There is evidence that interventions promoting physical exercise can improve well-being. In a 2013 study by Weight et al, all physician residents and fellows at Mayo Clinic in Rochester, MN were invited to participate in a 12-week incentivized exercise program, which included a baseline survey assessing demographic information, body mass index, exercise habits, quality of life, burnout, and program participation status.[84] Of 1060 residents and fellows, 628 (59%) completed the baseline survey and 230 (22%)

enrolled in the 12-week incentivized exercise program. Those who completed the program were significantly more likely to meet the Department of Health and Human Services recommendations for exercise, had significantly higher quality of life, and had lower burnout (though not statistically significant) than those who did not complete the program but had equal access to the same fitness facilities. In a 2013 study by Lebensohn et al with 168 post-graduate year 1 medical residents, those who had higher self-reported levels of physical activity had a lower risk of depression and burnout and higher life satisfaction.[85] In a 2014 study with Swedish health care workers, those who increased their physical activity levels were less depressed, less anxious, and experienced less burnout.[35] In a 2015 study by Bretland and Thorsteinsson with 49 inactive volunteers, those who completed a 4-week exercise program (cardiovascular exercise $n = 20$, resistance exercise $n = 9$) had greater positive well-being and personal accomplishment and less psychological distress, perceived stress, and emotional exhaustion compared to the control group ($n = 20$) that did not exercise.[86]

In a 2017 study of 4 402 medical students, Dyrbye et al found that students who self-reported compliance with exercise guidelines from the CDC (150 minutes of moderate activity or 75 minutes of vigorous activity for aerobic exercise guidelines, strength training all major muscle groups at least twice a week for strength training guidelines) had lower burnout scores and higher quality of life scores.[36] Compliance with exercise guidelines was an independent predictor of a lower risk of burnout after controlling for age, sex, relationship status, children, and year in school. Notably, a third of participating medical students did not follow the CDC aerobic exercise guidelines and

nearly two-thirds did not follow strength training guidelines. These numbers could be even lower since this study relied on self-report measures.

Resiliency Training

Resiliency training may help clinicians manage the unavoidable stress inherent to their jobs, enhance quality of care, and improve the sustainability of the health care work force.[62,87] In a study looking at the relationship between resilience and burnout in Chinese nurses, increased resilience scores were negatively correlated with burnout symptoms, but the correlations were weak.[88] In a study of 1239 ICU nurses (from 3 500 randomly selected registered critical care nurses in the United States from the American Association of Critical-Care Nurses membership list), nurses who were considered highly resilient had a significantly lower rates of posttraumatic stress disorder (8%) compared to those who were not highly resilient (25%), and had fewer symptoms of anxiety (8% vs 21%), depression (2% vs 14%), and burnout (emotional exhaustion 43% vs 66%, depersonalization 28% vs 49%, decreased personal accomplishment 28% vs 57%, and any burnout symptoms 61% vs 85%).[89]

In a 2020 study of 43 PT students in Indianapolis by Mejia-Downs, 22 participants were randomly assigned to an intervention group consisting of an 8-hour resilience curriculum that was delivered in 4 consecutive, 2-hour weekly sessions, while 21 participants were assigned to a wait-list control group.[90] The resilience curriculum, “Stop Running on Empty!” was developed and delivered by the author beginning in week 3 of the fall semester for first-, second-, and third-year students. There were significantly greater increases in resilience and positive emotions in the intervention group compared

to the control group, and there were no significant differences in stress, coping flexibility, negative emotions, optimism, social support, or illness symptoms. Burnout was not assessed in this study and there was no long-term follow up.

Coping Strategies

Physician residents who report a lack of coping skills are more likely to report burnout.[91] Some coping strategies such as avoidance coping (including denial, substance use, venting, behavioral disengagement, self-distraction, and self-blame) are known to be problematic, while other strategies such as approach coping (including active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support) have more positive outcomes.[92,93] Avoidance coping has been shown to be a strong predictor of burnout in nurses, even if used infrequently.[94] Interventions that teach coping skills such as relaxation and cognitive reappraisal may help reduce stress and burnout.[94] More research is needed to determine how best to teach approach-oriented coping strategies and if coping skills learned early on are transferrable to later practice.[42]

Nowakowska-Domagala et al assessed the relationship between coping styles and burnout in a 2015 study with 117 physiotherapists practicing in the Lodz region of Poland.[46] Task-oriented coping had a negative correlation with burnout, emotion-oriented coping had a positive correlation with burnout, and avoidance-oriented coping had no correlation with burnout. The coping styles correlated independently with professional burnout, without any mutual correlations. Wilski et al found similar results in a 2015 study with 155 physiotherapists from 5 different regions in Poland.[50] Physiotherapists

who perceived a situation as difficult to control had higher burnout scores when they use more emotion-focused strategies (involving self-preoccupation, fantasy or other conscious activities related to affect regulation) and less problem-focused strategies (aiming to alter the stressor via a direct action).

Interventions at the Educational Level

Addressing burnout could start in physical therapy schools before individuals enter the workplace. Faculty members of physical therapy schools should educate their students about the possibility of burnout. An understanding by the students of the dynamics of the patient-therapist interaction and the possibility of burnout may help to prevent its occurrence.[22] Physical therapy programs could also work to decrease the burden on students by decreasing the required credit hours and by adding a variety of new learning experiences, such as computer-aided instruction, role playing, simulation, and problem based learning.[56] Two other common interventions at the educational level include modifying the grading system and modifying the learning environment or curriculum, as summarized below.

School Grading System

The grading system used in schools can influence student burnout. In a study of 2,056 first- and second-year medical students at 7 US medical schools in 2007, Reed et al found that medical students in pass-fail curricula were less likely to have burnout than students not in pass-fail curricula, even when controlling for multiple other curricular factors, including time spent in didactics and clinical experiences, number of exams, and length of vacation.[43] Earlier studies also support a pass-fail curricula, providing evidence

that moving to a pass-fail curriculum can improve medical student well-being.[95,96] In the study by Rohe et al of the Mayo Medical School graduating classes of 2005 and 2006, students who were evaluated with a pass-fail grading system rated themselves as having significantly less stress, better overall mood, and greater group cohesion compared with their letter-graded peers.[96] In the study by Bloodgood et al following the University of Virginia School of Medicine graduating classes of 2006 and 2007, changing to a pass-fail curriculum did not result in any decline in academic performance, attendance at scheduled academic activities, or residency placement success.[95] The change to a pass-fail grading system was also accompanied by a statistically significant improvement in psychological factors related to anxiety, depression, positive well-being, self-control, vitality, and general health in the first three semesters of medical school.

The majority of medical schools now use a pass-fall grading system, with 125 schools using it in 2019-2020, up from 87 schools in 2014-2015.[97,98] It is unknown how many physical therapy programs use a pass-fail grading system and many programs have different grade requirements and cutoffs for academic probation and dismissal from the program.

Learning Environment/Curriculum

Many medical schools have introduced curricula to promote self-care and teach positive coping skills and mindfulness-based stress reduction in an effort to help learners promote their well-being.[42] In a 2016 study of 27 US medical schools participating in the American Medical Association's Accelerating Change in Medical Education Consortium, more than half had a well-being curriculum and most offered a variety of

emotional/spiritual, physical, financial, and social well-being activities intended to promote self-care, reduce stress, and build social support for medical students.[99] Evaluation strategies consisted mostly of participation rates and student satisfaction and there were substantial variations of well-being resources across the schools.

Many medical school curricular changes have included some form of mindfulness-based stress reduction or resilience training.[100–106] Some authors have reported significant improvements in stress, anxiety, burnout, and other aspects of well-being.[100–104] Intervention requirements varied widely, from attending courses and small groups for 8 weeks to independently listening to a mindfulness CD with no lectures or group work. Most studies did not include an appropriate control group and were vulnerable to volunteer bias. Several other studies have not found measurable improvements in learners' stress and emotional health as a result of wellness and stress management courses.[105,106] In a study by Dyrbye et al at the Mayo Clinic School of Medicine, the stress management and resilience training course was required.[105] In the study by Slavin and Chibnall, curricular changes made at their institution (Saint Louis University School of Medicine) were effective in reducing depression and anxiety in first year medical students, but interventions geared toward second and third year medical students were less successful. This result may be due to conditions at the institutional level (such as interacting with other residents and faculty who may have poor mental health) and/or the national level (such as step 1 of the United States Medical Licensing Examination).[106] Since students vary in their acceptance of intervention strategies, a

"menu" of options is recommended, as well as gathering real-time opinions when implementing interventions and developing new initiatives.[107]

A 2016 systematic review looking at medical school learning environment interventions aimed at improving well-being among medical students found limited evidence that specific changes to the learning environment improved well-being, but the quality of evidence was low.[108] The authors did report that medical schools should consider a multi-faceted approach that includes pre-clinical pass-fail curricula and formal faculty advisor-mentor programs to improve well-being. Currently there is no evidence regarding whether new curricular models (longitudinal clerkships, accelerated medical school training) or how grades are assigned (norm-based, criterion-based) affect the risk of developing burnout.

In a 2016 study of pediatric PTs, Willgens and Hummel performed grounded theory qualitative analysis to create a curricular model of evidence-based self-care to offer well-being and resilience to this unique population of therapists.[109] The authors summarized their findings into a curricular model with 8 lessons, complete with proposed activities, objectives, and evidence-based resources. The proposed curriculum could be inserted at any stage of a PT education program and adjusted to meet the needs of both students and faculty. It was created for 8 weekly meetings but could be adjusted for 16 weeks based on the depth and breadth desired. This model served as the basis for the curriculum in the 2019 study by Kindel and Rafoth with 32 second-year PT students at a small, private institution, who found a statistically significant improvement in perceived

stress scores of the experimental group both immediately after the intervention and at the end of the semester.[81]

A 2018 study by Mueller et al of 36 PT students at Northern Arizona University assessed the impact of the Called to Care curriculum on students' empathy, resilience, and work engagement during their clinical internships.[110] The Called to Care curriculum is grounded in the science of positive psychology and is offered by the group Evidence in Motion with the purpose of improving patient outcomes through the development of optimal PT behaviors. The online curriculum consists of 11 modules and is self-paced. All students completed an orientation session and baseline measures which included the Jefferson Scale of Empathy – Health Professions Version, Utrecht Work Engagement Scale-17, and the 12-item GRIT Scale. The students were then randomized into two groups: an immediate intervention group and delayed intervention group. The immediate intervention group completed Called to Care during their first 10-week internship while the delayed group received no intervention. The delayed group completed Called to Care during their second 10-week internship. Measures were taken between first and second internships as well as after the second internship. The immediate intervention group made significant improvements in all three measures between the first and second internships compared to the delayed intervention group and the improvements were maintained over the 10-week duration of the second internship. The delayed intervention group made no significant changes in the three measures during the first internship, but each improved significantly at the end of the second internship.

INTERVENTIONS AT THE HEALTH CARE ORGANIZATIONAL LEVEL

The goal of health care organizations should be to minimize the harm caused by unavoidable suffering. The goal for avoidable suffering should be prevention, and interventions should focus on systems improvement. Approaches targeting organizational improvements seem to be more effective than those that focus on physicians themselves.[62]

Structural interventions mentioned by West et al in a 2016 systematic review and meta-analysis burnout interventions in practicing physicians and residents included shortening attending rotation length, various modifications to clinical work processes, and shortened resident shifts.[73] In a 2017 systematic review and meta-analysis by Panagioti et al, five studies evaluated simple workload interventions that focused on rescheduling hourly shifts and reducing workload, while three studies tested more extensive interventions incorporating discussion meetings to enhance teamwork and leadership, structural changes, and elements of physician interventions such as communication skills training and mindfulness.[72] The authors found that the effects of organization-directed interventions were significantly larger than the effects of physician-directed interventions. The organization-directed interventions were associated with medium significant reductions in burnout, while the individual-directed interventions were associated with small but significant reductions in burnout.

Health care organizations and work environmental factors play a large role in the development (or prevention) of burnout. Some ways these organizations can work to prevent or reduce burnout include improving workflows, creating manageable patient

loads, lengthening the time allotted for patient visits, enhancing staffing ratios, and improving clinic resources to treat complex patients with co-morbid mental and physical health conditions.[23] Frequent and clear communication also appeared in the literature as a way to combat workplace stress, which could contribute to burnout.[22,31] Health care organizations could provide sanctioned "time-outs," where the individual is able to remove themselves from interaction with patients and work on something else, such as paperwork, educational materials, or research.[22] This time should be in addition to regularly scheduled breaks or vacations. Another option would be the implementation of collaborative or team-based care models that facilitate load sharing to reduce overload.[22,23] Health care providers must be treated with respect and autonomy and given the authority to make rational, safe, evidence-based, and financially responsible decisions.[70] Health care organization personnel should seek to: provide career pathways in which skill in patient management can be rewarded monetarily, maintain a challenging environment, and provide opportunities for continuing education.[22,28,31] Making changes in health care systems that may be creating moral injury to clinicians will be a challenging but necessary step in addressing and preventing clinician burnout.[70] Moral injury, a relatively new concept circulating in literature on psychological trauma, is present when there has been a betrayal of "what's right;" either by a person in legitimate authority or by one's self in a high stakes situation.[111]

In summary, the targets of burnout interventions need to match the underlying causes of burnout. While focusing on individual factors such as resilience and coping strategies can be helpful in reducing harm caused by unavoidable suffering, they do

nothing to solve the underlying causes of avoidable suffering, such as overwork and understaffing, a hostile work environment, unsafe working conditions, and failure to provide the resources that all health care providers need to provide safe care.[62] Mandating individual-focused interventions such as resilience training may be harmful as it could give the illusion of a simple solution and may send the message that the individual is the problem, not the organization or work environment. Individual-focused interventions as optional offerings among a variety of choices may be a more acceptable and effective strategy.[42,62,107] Organizational interventions are critical and interventions may be more effective if individual and organizational interventions are combined.[42,112] Both individual-focused and organizational interventions can reduce burnout and both strategies are probably necessary.[73]

CHAPTER III

RELIABILITY AND VALIDITY OF THE STUDENT VERSION OF THE OLDENBURG BURNOUT INVENTORY IN PHYSICAL THERAPIST STUDENTS

INTRODUCTION

Burnout is a negative psychological response to chronic work stress in any occupation.[1,2] As of May 2019, burnout has been officially recognized by the World Health Organization as an occupational phenomenon.[3] While the World Health Organization specifically states that burnout is not classified as a medical condition, nine countries in the European Union acknowledge burnout syndrome as an occupational disease.[4] Burnout is often measured using subgroups of symptoms including feelings of energy depletion or exhaustion, increased mental distance from one's job, or feelings of negativism or cynicism related to one's job, and reduced professional efficacy.[3] Although burnout is considered to be related to work, the concept may be applied to groups doing work-like activities outside the occupational context that are structured, directed towards specific goals, and are psychologically similar to work, such as those that pertain to students or athletes.[5] Burnout has become an increasingly popular topic of discussion in recent years in health care education as health care providers and students are pushed to capacity with increasing expectations and decreasing resources.

Burnout has many negative consequences for the person, their employer or school, and their patients. Burnout in health care professionals is associated with an increase in self-perceived errors related to patient safety.[6] It is associated with increased

irritability, anxiety, guilt, feelings of helplessness, and anger.[7] Additional consequences include deterioration of psychological, physiological, and cognitive functions, low morale, low productivity, absenteeism, job turnover, and alcohol or drug abuse.[8] Burnout has considerable overlap with depressive symptoms and may be a possible precursor to depression.[6,9] Burnout has been shown to affect academic performance, mental health, and quality of life, and medical students who experience burnout may be more likely to exhibit unprofessional behavior, such as self-prescribing medication and being less likely to believe they should report impairment among fellow medical students due to alcohol or substance abuse.[10,11]

While there is an abundance of published research on burnout in physicians and nurses, the literature on burnout in PTs is far more limited. Existing studies have been conducted with PTs in Poland,[8,12–15] Italy,[16] Spain,[17] Australia,[18] and the United States.[19–24] Though most of the studies conducted in the United States were published in the 1980s and 1990s, a 2015 platform presentation at the World Confederation for Physical Therapy Congress contained results of a study conducted using a stratified sample of 6500 PT members of the APTA. [24] From the sample, 1366 PTs responded and 29% were found to have self-reported high emotional exhaustion, 15% had high perceived stress, and 13% were considered to have burnout (defined as high emotion exhaustion, high depersonalization, and low personal accomplishment). Only two studies have been identified that included PT students, both of which found an increase in aspects of burnout over the course of a semester.[25,26] PT student burnout is difficult to address when the prevalence is unknown and few outcome measures exist to study burnout in students.

The majority of studies on burnout in all populations have used some version of the MBI, an outcome measure created in 1981 that was built on the concept that burnout is a multidimensional construct that involves three distinct but related aspects: emotional exhaustion, depersonalization, and reduced personal accomplishment.[27] Recently, the MBI has been criticized due to issues with the measure including its three factor structure, the unidirectional wording of questions, the inconsistencies with cutoff scores, and variable burnout definitions.[2,28] The MBI is also protected by copyright and distributed by a commercial publisher at a cost, while other burnout measures are free to use.

Several outcome measures have been developed in response to the criticisms and psychometric limitations of the MBI, including the OLBI.[1] The OLBI measures feelings of exhaustion and disengagement from work and includes both negatively and positively worded items for each dimension.[29] The OLBI was translated into English in 2005 by Halbesleben et al who also established construct validity of the English version.[1] A student version of the OLBI (OLBI-S) was developed by Reis et al.[30] The OLBI-S is free to use and includes positively worded items for assessing the opposite experience of burnout which is engagement, defined as a positive, fulfilling, and work-related state of mind.[31] While the OLBI-S has been used with university students in Greece and Germany, it has not yet been validated in PT students in the United States.

The purpose of this study was to assess the test-retest reliability of the OLBI-S and convergent validity of the OLBI-S with the MBI-GSS in DPT students. We

hypothesized that the OLBI-S would have acceptable levels of reliability and validity with correlations of .5 or greater.

METHOD

Participants

An *a priori* power analysis for intraclass correlation coefficients (ICC) with power = .8, alpha level = .05, and ICC value = .7 revealed a sample size of 10 participants was needed.[32] Participants included a convenience sample of DPT students attending Texas Woman's University in Houston during the fall semester of 2020. Students from all three cohorts were recruited via email. Institutional Review Board approval was obtained from Texas Woman's University prior to the initiation of this study.

Instrumentation

The outcome measures utilized were the OLBI-S and MBI-GSS. The OLBI-S has two subscales: exhaustion and disengagement. Each 8-item subscale has four positively and four negatively worded questions, and after reverse scoring negative items, scores for the eight items for each subscale are averaged together. The OLBI-S is scored on a 5-point, Likert-type scale from strongly agree (1) to strongly disagree (5) with higher scores indicating a higher level of burnout. Both the exhaustion (Cronbach's $\alpha = .87$) and the disengagement (Cronbach's $\alpha = .81$) subscales were found to be reliable.[30] The MBI-GSS is a 16-item measure with three subscales: exhaustion (five items), cynicism (five items), and professional efficacy (six items).[33] It is graded on a 7-point Likert-type scale from

never (0) to every day (6). The MBI is considered the standard tool for burnout research and the student version has been validated in many populations.[31,34–36]

Procedures

Students were asked to complete the OLBI-S and MBI-GSS via a Psychdata survey. Students who completed the first study were asked to complete the OLBI-S a second time 1 week later. Intraclass correlation coefficients (two-way random effects model, absolute agreement) were calculated to examine test-retest reliability and Bland-Altman plots were constructed to assess level of agreement by plotting individual differences against individual mean scores. The significance level was set at .05. Convergent validity was assessed by calculating Pearson's correlations comparing the exhaustion subscales for the OLBI-S and MBI-GSS and comparing the disengagement subscale of the OLBI-S and cynicism subscale of the MBI-GSS. Qiao and Schaufeli give empirical, theoretical, clinical, and psychometric evidence that the personal accomplishment/professional efficacy factor should not be included as part of the burnout construct and agree with previous authors that the core of burnout includes a mix of two factors (exhaustion and cynicism/disengagement).[5] For this reason, the professional efficacy subscale of the MBI-GSS was not utilized in this study.

RESULTS

Forty-nine students started the first survey; however, two students started the survey but did not complete it, and two more students filled out only the MBI-GSS portion of the survey but not the OLBI-S portion. Forty-five students fully completed the first survey. Means and standard deviations can be found in Table 3.1 (average scores are

reported). Convergent validity was assessed using Pearson's correlation coefficient and was found to be good between the exhaustion subscales for the OLBI-S and MBI-GSS (r = .741, p < .001) as well as the disengagement subscale of the OLBI-S and cynicism subscale of the MBI-GSS (r = .766, p < .001; see Table 3.2).

Forty-two of 45 students completed the second survey. Test-retest reliability was found to be good for both the OLBI-S exhaustion subscale and OLBI-S disengagement subscale. The ICC for the OLBI-S exhaustion subscale was .916 with a 95% confidence interval from .843 to .955 (F(41) = 11.638, p < .001). The ICC for the OLBI-S disengagement subscale was .955 with a 95% confidence interval from .916 to .976 (F(41) = 21.669, p < .001). Bland-Altman plots were constructed for both the OLBI-S exhaustion subscale and OLBI-S disengagement subscale (Figures 3.1 and 3.2). The plots did not appear to show proportional bias as most of the points fell between the two confidence intervals and did not appear to follow a trend. This was confirmed with a follow up linear regression analysis using the difference and mean scores for each subscale. The linear regression analysis was not significant for the OLBI-S exhaustion subscale (β = .007, p = .940) or the OLBI-S disengagement subscale (β = .078, p = .249).

Table 3.1. Means and Standard Deviations of MBI-GSS and OLBI-S Subscale Scores

	MBI-GSS Exhaustion	MBI-GSS Cynicism	OLBI-S Exhaustion	OLBI-S Disengagement
Time 1 (n = 45)	4.17 ± 1.20	2.33 ± 1.47	3.47 ± .65	2.81 ± .67
Time 2 (n = 42)	-	-	3.47 ± .66	2.79 ± .62

Table 3.2. Correlations Between MBI-GSS and OLBI-S Subscales

	MBI-GSS Exhaustion	MBI-GSS Cynicism	OLBI-S Exhaustion	OLBI-S Disengagement
MBI-GSS Exhaustion	-			
MBI-GSS Cynicism	.551**	-		
OLBI-S Exhaustion	.741**	.437**	-	
OLBI-S Disengagement	.523**	.766**	.590**	-

** Correlation is significant at the .01 level (2-tailed)

Figure 3.1. Bland-Altman Plot for the OLBI-S Exhaustion Subscale

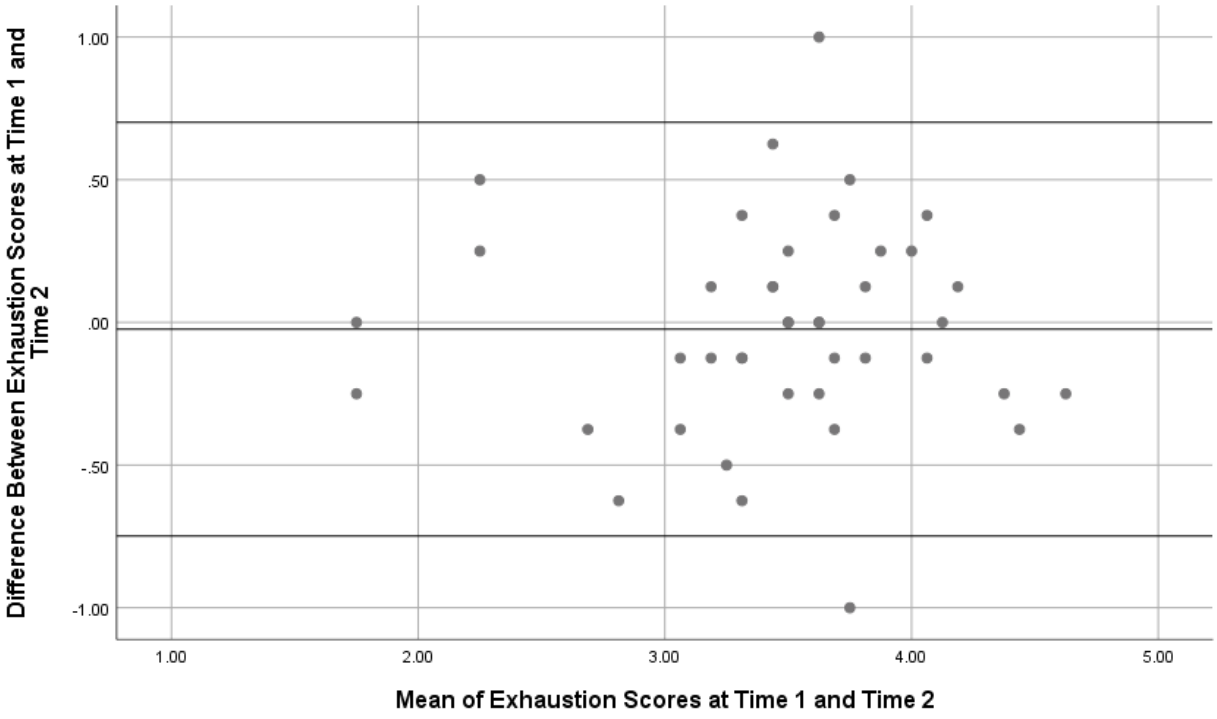
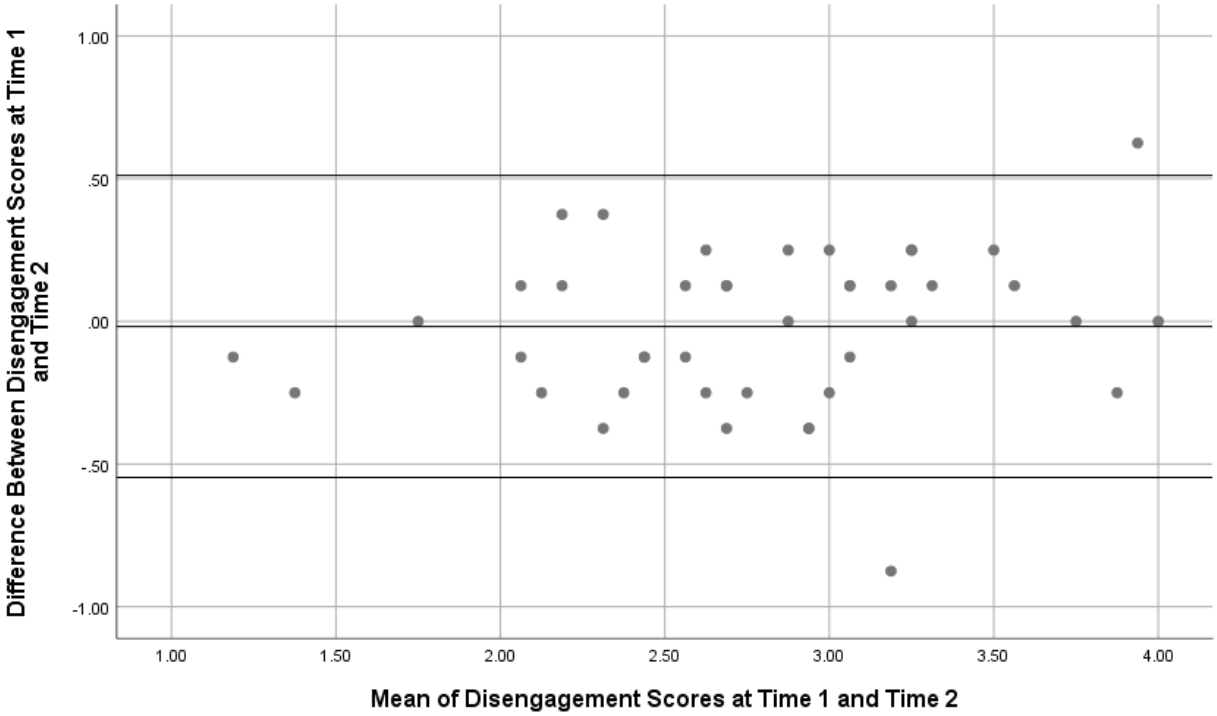


Figure 3.2. Bland-Altman Plot for the OLBI-S Disengagement Subscale



DISCUSSION

The results of this study indicate that the OLBI-S is a reliable and valid outcome measure to assess burnout in PT students. Previous studies have validated the English and student versions of the OLBI using factor analysis and multi-trait, multi-method matrix analysis.[1,30,37] Demerouti et al[37] reported the correlation between the MBI-GS exhaustion subscale and the OLBI exhaustion subscale in Greek employees was r = .60, while we found a larger value of the correlation between the MBI-GSS exhaustion subscale and OLBI-S exhaustion subscale of r = .74. The same study reported the correlation between the MBI-GS cynicism subscale and OLBI disengagement subscale was r = .60, while we found a larger value of the correlation between the MBI-GSS cynicism subscale and OLBI-S disengagement subscale of r = .77. Halbesleben et al[1] reported test-retest

reliability of the OLBI for employees as $r = .51$ for the exhaustion subscale and $r = .32$ for the disengagement subscale, with 4 months separating Test 1 from Test 2. Our study utilized a shorter time frame between Test 1 and Test 2 (1 week) and found stronger test-retest reliability using ICC, with an ICC = .916 for the exhaustion subscale and ICC = .955 for the disengagement subscale.

This study is the first that we know of to assess the reliability and validity of the OLBI-S in DPT students. While a majority of studies that assess burnout use the MBI, the MBI is protected by copyright and distributed by a commercial publisher at a cost. Since this study identified that the OLBI-S has acceptable levels of reliability and validity with correlations of .5 or greater, it appears to be a reasonable free alternative to measure burnout in DPT students.

This study has several limitations. The participants were recruited from a convenience sample at one DPT program in Texas and results may not be generalizable to all DPT students in the United States. While we met the goal of the power analysis to have at least 10 participants, we still had a small sample size as only 45 students completed the first survey and 42 students completed the second survey.

CONCLUSION

The OLBI-S has excellent reliability, good validity, and is a free alternative outcome measure to the MBI-GSS to measure burnout in DPT students. Future studies could compare the two outcome measures with students from other DPT programs in different regions to improve the generalizability of the results.

CHAPTER IV

LEVELS OF BURNOUT AND ASSOCIATED FACTORS IN THE DEVELOPMENT OF BURNOUT IN PHYSICAL THERAPIST STUDENTS

INTRODUCTION

Burnout is a negative affective response to prolonged impairing stress related to one's work.[1,2] Burnout is different from temporary states like fatigue (which can decrease with adequate rest) or boredom (which can decrease with a change in task or activity) as burnout is not immediately reversible after changes in tasks or working conditions.[2] While burnout was initially thought to occur among individuals who work with people in some capacity, the concept of burnout has come to include more than just those who do "people work" and pertains to other occupations. This includes groups doing work-like activities outside the occupational context that are structured, directed towards specific goals, and are psychologically similar to work, such as students or athletes.[3,4] Burnout follows a developmental process that might begin during students' academic studies and continues as they transition into the workforce, making burnout an important subject to investigate in students to mitigate or prevent its effects later in life.[5,6]

The gradual development of burnout is a dynamic and complex process that is influenced by numerous factors. In studies with medical and nursing students, some individual factors that appear to affect the development of burnout include reduced level of physical activity, reduced level of social support, not experiencing positive life events, increased fatigue, increased stress, decreased resilience, and being a non-minority.[5,7–10]

Environmental factors that may influence the development of burnout include grading scheme and perceptions of the learning environment.[7,9,11,12] Curricular and clinical education hours do not seem to contribute to the development of burnout.[7,8,12]

Most of the studies focusing on burnout in students have assessed medical and nursing students, and few have assessed PT students. Two studies compared levels of PT student burnout at the beginning and end of a semester: a 1999 study by Balogun et al with students in their junior year during a spring semester (baccalaureate level) and a 2018 study by Williams et al with first- and second-year students during a spring semester (doctorate level).[13,14] Balogun et al used the MBI and reported students had a significant increase in exhaustion over the course of a semester, while Williams et al used the OLBI-S and reported students had a significant increase in exhaustion and disengagement over the course of a semester. Williams et al also reported that second-year students had higher exhaustion and disengagement levels compared to first-year students. Both studies assess cohorts of students at one university. To our knowledge, no studies have been conducted with PT students to assess which factors may contribute to the development of burnout, nor have any such studies been conducted at a national level.

Study 2 was a national cross-sectional study designed to assess the burnout scores and distribution among burnout groups of DPT students by graduate year as well as to assess which demographic, individual, and environmental factors may be associated with the development of burnout in DPT students in the United States. The first specific aim of this study was to determine if there is a difference in burnout scores among students in different years of a DPT program; the research hypothesis was that burnout scores would

be significantly different among students in different years in a DPT program. The second specific aim was to determine cut-off scores that would be used to group students into burnout categories as described by Williams et al.[13] The third specific aim was to determine which demographic, individual, and environmental factors may influence the development of burnout.

METHOD

Participants

While some logistic regression sample size guidelines are based on the rule of event per variable, Bujang et al report that a minimum sample size of 500 is necessary to derive the statistics that are nearly representative of the true values in the targeted population.[15] According to data obtained from the Commission on Accreditation of Physical Therapy Education, there were more than 34 000 DPT students from 256 accredited DPT programs in 2019.[16] All DPT programs in the United States with DCE email addresses (N = 231) were contacted during recruitment with a goal of at least 500 DPT student participants.

Instrumentation

A Psychdata survey was developed which incorporated several existing assessments from previous studies as well as demographic data and several outcome measures. The outcome measure used to assess burnout was the OLBI-S, which was found to be reliable and valid by Study 1; it measures the two main components of burnout: exhaustion and disengagement. In addition, physical activity, resilience, and perceived stress were measured. Physical activity was measured using the SGPALS, a 1-

item, 4-level scale ranging from physically inactive to regular hard physical training for competitive sports.[17–19] Resilience was measured using the 10-item CD-RISC. The 10-item scale is an abridged version of the original 25-item scale and was found to have good internal consistency and construct validity.[20] Perceived stress was measured using the 10-item PSS. The 10-item PSS was found to have superior psychometric properties when compared with the 4-item and 14-item versions.[21]

Additional questions regarding student characteristics, perceived level of support, and DPT school learning environment were adapted from studies conducted by Dyrbye et al and are listed in Appendix 4A.[8,9] For the questions regarding life events, students were asked to indicate if the life event occurred and if they perceived the life event as a positive or negative event. For level of support and learning environment questions, each item used a 5-point scale so that students indicated their degree of satisfaction (ie, very dissatisfied, somewhat dissatisfied, neutral, somewhat satisfied, very satisfied) or level of agreement (ie, strongly disagree, disagree, neutral, agree, strongly agree). Responses of somewhat dissatisfied, very dissatisfied, disagree, and strongly disagree were considered indicative of a suboptimal learning environment/perceived level of support.

Procedures

An email request was sent to DCEs for each DPT program in the United States requesting that they send a recruitment email to their DPT students that included the Psychdata survey link. A reminder email was sent 1 week after the initial email request. The Psychdata survey included demographic questions, OLBI-S, SGPALS, 10-item CD-RISC, and 10-item PSS, as well as the questions listed in Appendix 4A. The outcome

measures appeared separately with their original instructions to maintain the integrity of each outcome measure. Students who completed the survey were given the option of providing their email address to the principal investigator if they were willing to participate in a follow-up qualitative study to explore their perceptions on burnout and well-being (Study 3).

To test the hypothesis of the first specific aim of this study that burnout levels are different among students in different years in a DPT program, two one-way independent ANOVAs were conducted, one for each of the OLBI-S subscales (exhaustion and disengagement) compared to year in a DPT program (first, second, third). Bonferroni post-hoc testing for significant main effects were conducted if an ANOVA was found to be significant. To complete the second specific aim to determine cut-off scores to group students into one of four categories (Burnout, Exhaustion, Disengagement, and Non-Burnout), cut-off scores were determined using quartiles as described by Williams et al in Table 4.1 and then students were categorized into groups based on their score severity as described in Table 4.2.[13]

Table 4.1. OLBI-S Score Severity

	Exhaustion Scores	Disengagement Scores
High (Top Quartile)	4Q	4Q
Average (Middle Quartiles)	2&3 Q	2&3 Q
Low (Bottom Quartile)	1Q	1Q

Table 4.2. Burnout Groups

	Exhaustion Scores	Disengagement Scores
Burnout Group		
Exhausted and Disengaged	High	High
Exhausted	High	Low or Average
Disengaged	Low or Average	High
Non-Burnout Group	Low or Average	Low or Average

To test the hypothesis of the third specific aim that different demographic, individual, and environmental factors may be associated with the development of burnout, the DPT students were first dichotomized into two groups: burnout (high exhaustion, high disengagement, or both) and those without burnout (all other students). As a primary analysis, simple logistic regression was conducted for each demographic, individual, and environmental factor from the Psychdata survey to determine which factors had a significant influence on burnout group category (burnout or non-burnout). An alpha level of $\alpha = .05$ was used for the primary analysis as this study was exploratory in nature. Factors found to be significant in the primary analysis were then entered into a multivariate logistic regression. An alpha level of $\alpha = .0125$ was used for the multivariate analysis to reduce the probability of type I error. Odds ratios and confidence intervals are reported for the factors entered into the multivariate analysis, which identify factors that have a significant influence on the development of burnout. Results from the multivariate analysis were used to formulate an equation to predict which students may be at risk for developing burnout.

RESULTS

The first email request was sent to 231 DCEs October 19, 2020, with a follow-up email sent 1 week later. The survey was open for 4 weeks and was closed on November

13, 2020. A total of 1480 responses were received. Of those responses, 1340 contained complete data and were included in the study. There were 522 students who included their email addresses to indicate interest in participating in a follow-up interview. Demographic information can be found in Table 4.3.

Table 4.3. Demographic Information

		Total *N* = 1340 (100%)
Gender	Female	1 024 (76.4%)
	Male	314 (23.4%)
	Other	2 (0.1%)
Age Group	< 25	869 (64.9%)
	25-28	359 (26.8%)
	> 28	112 (8.4%)
Race	American Indian or Alaska Native	9 (0.7%)
	Asian	78 (5.8%)
	Black or African American	30 (2.2%)
	Native Hawaiian or Other Pacific Islander	6 (0.4%)
	White	1 153 (86.0%)
	Other	48 (3.6%)
	Choose not to disclose	16 (1.2%)
Ethnicity	Hispanic or Latino or Spanish Origin	105 (7.8%)
	Not Hispanic or Latino or Spanish Origin	1 235 (92.2%)
Married	Yes	284 (21.2%)
	No	1 056 (78.8%)
Children	Yes	40 (3.0%)
	No	1 300 (97.0%)
Life Events in the Previous 12 Months	Marriage	83 (6.2%)
	Divorce	6 (0.4%)
	Having or adopting a child	12 (0.9%)
	Death of a close family member	259 (19.3%)
	Major personal illness	112 (8.4%)
	Major illness in close family member or significant other	347 (25.9%)
	≥ 1 positive life event	113 (8.4%)
	≥ 1 negative life event	492 (36.7%)
Year in DPT School	First Year	402 (30.0%)
	Second Year	469 (35.0%)
	Third Year	466 (34.8%)

	Other (eg, research)	3 (0.2%)
DPT School Region	Northeast (CT, MA, ME, NH, NJ, NY, PA, RI, VT)	257 (19.2%)
	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	348 (26.0%)
	South (AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV)	536 (40.0%)
	West (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY)	199 (14.9%)
Type of DPT Program	Traditional, in-person classes	215 (16.0%)
	Hybrid due to COVID-19	1 077 (80.4%)
	Hybrid	19 (1.4%)
	Other	29 (2.2%)
	None	242 (18.1%)
Total Debt (School and Personal)	$1 – $49,999	366 (27.3%)
	$50,000 – $99,999	416 (31.0%)
	> $100,000	316 (23.6%)
Currently Working for Income	Yes	429 (32.0%)
	No	911 (68.0%)

To test the hypothesis of the first specific aim of this study that burnout levels would be different among students in different years in a DPT program, two one-way independent ANOVAs were conducted, one for each of the OLBI-S subscales (exhaustion and disengagement) compared to year in a DPT program (first, second, third) to assess if burnout levels were different (see Table 4.4). The analyses were performed on data from 1 337 participants as the data for the three students who selected "other" for their year in DPT school were omitted. There was not a significant difference among students in different years in a DPT program for either the exhaustion subscale ($F(2,1334) = .568$, $p = .567$) or the disengagement subscale ($F(2,1334) = 1.992$, $p = .137$).

Table 4.4. Burnout Scores by Year in a DPT Program

Year in a DPT Program	Number of Students (%) N = 1337	OLBI-S Exhaustion Subscale Score (Mean ± SD)	OLBI-S Disengagement Subscale Score (Mean ± SD)
First Year	402	3.58 ± .58	3.04 ± .55
Second Year	469	3.58 ± .60	3.08 ± .56
Third Year	466	3.54 ± .60	3.11 ± .58

To complete the second specific aim to determine cut-off scores to group students into the burnout and non-burnout groups, cut-off scores were determined according to quartiles and students were categorized into groups based on their score severity as described in the Method section. Cut-off scores used to group students into one of four categories (both exhausted and disengaged, exhausted, disengaged, or non-burnout) and frequencies of students in each group can be found in Tables 4.5 and 4.6. A majority of DPT students were in the non-burnout group (64.6%) with low or average exhaustion and disengagement scores and only 5.9% of DPT students had both high exhaustion and high disengagement scores. The remaining 29.5% had either high exhaustion or high disengagement subscale scores.

Table 4.5. OLBI-S Score Severity

	Exhaustion Scores	Disengagement Scores
High (Top Quartile)	> 4.00	> 3.50
Average (Middle Quartiles)	3.16 – 4.00	2.63 – 3.50
Low (Bottom Quartile)	< 3.16	< 2.63

Table 4.6. Burnout Group Frequencies

Group	Number of Students in Year 1 (%)	Number of Students in Year 2 (%)	Number of Students in Year 3 (%)	Number of Students in "Other" (%)	Total Number of Students (%)
Burnout Group	150 (37.3%)	152 (32.4%)	171 (36.8%)	1 (33.3%)	474 (35.4%)
Exhausted and Disengaged	22 (5.5%)	33 (7%)	24 (5.2%)	0 (0%)	79 (5.9%)
Exhausted	58 (14.4%)	65 (13.9%)	68 (14.6%)	0 (0%)	191 (14.3%)
Disengaged	70 (17.4%)	54 (11.5%)	79 (17%)	1 (33.3%)	204 (15.2%)
Non-Burnout Group	252 (62.7%)	317 (67.6%)	295 (63.3%)	2 (66.7%)	866 (64.6%)

To test the hypothesis of the third specific aim that different individual and environmental factors are associated with the development of burnout, the DPT students were first dichotomized into two groups: those with burnout (high exhaustion, high disengagement, or both) and those without burnout (all other students). For the primary analysis, simple logistic regression was conducted for each individual and environmental factor (see Table 4.7) with an alpha level of $\alpha = .05$. Several variable categories were removed from analysis due to having too few participants, including the "other" category for both the gender variable and the year in DPT school variable, the "hybrid" and "other" categories for the type of DPT program variable, and the "divorce" and "having or adopting a child" life events. Both continuous variables (CD-RISC score and PSS score) met the assumption of linearity of the logit.

Results for the univariate analysis can be found in Table 4.7. No demographic variables had a significant influence on burnout group category except DPT school

region, where students in the West region had significantly lower odds of developing burnout compared to the referent Northeast region. Other factors that were found to be significant in the primary univariate analysis included satisfaction with the level of support from family, peers, faculty, and academic or career advisor, satisfaction with the overall learning environment, level of agreement with feeling education is a high priority for faculty, level of agreement with the school promoting a collaborative rather than competitive environment for students, level of physical activity, CD-RISC score, and PSS score.

Table 4.7. Relationships of demographic factors, life events, perceived support, learning environment, physical activity, resilience, and perceived stress with burnout: univariate analysis

Variable (Referent Group)	*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
							Lower Level	Upper Level
Gender (Female)								
Male	-.133	.136	.952	1	.329	.875	.670	1.144
Age (< 25)								
25-28	.170	.130	1.689	1	.194	1.185	.917	1.530
> 28	.315	.205	2.359	1	.125	1.370	.917	2.048
Minority	.078	.144	.293	1	.588	1.081	.815	1.433
Married or in a domestic partnership	.069	.139	.245	1	.621	1.071	.816	1.407
Children	-.510	.370	1.902	1	.168	.601	.291	1.240
Year in DPT school (First year)								
Second year	.176	.144	1.495	1	.221	1.192	.899	1.580
Third year	.241	.143	2.827	1	.093	1.273	.961	1.686
DPT school region (Northeast)								
Midwest	-.288	.173	2.782	1	.095	.750	.535	1.052
South	.060	.156	.147	1	.701	1.062	.782	1.441
West*	-.504	.205	6.057	1	**.014**	**.604**	.405	.903
Type of DPT program (Traditional)								

Hybrid due to COVID-19	.286	.161	3.142	1	.076	1.331	.970	1.827
Total debt (None)								
$1-$49,999	-.211	.173	1.489	1	.222	.809	.576	1.137
$50,000-$99,999	-.119	.168	.502	1	.479	.888	.639	1.234
> 100,000	-.011	.176	.004	1	.950	.989	.700	1.397
Currently working for income	.004	.122	.001	1	.976	1.004	.790	1.276
Life events in the past 12 months								
Marriage	.412	.229	3.242	1	.072	1.509	.964	2.363
Death of a close family member	.153	.143	1.140	1	.286	1.165	.880	1.542
Major personal illness	.224	.202	1.231	1	.267	1.251	.842	1.858
Major illness in a close family member or significant other	.173	.129	1.787	1	.181	1.188	.923	1.530
≥ 1 positive life event	.208	.201	1.066	1	.302	1.231	.830	1.826
≥ 1 negative life event	.195	.118	2.737	1	.098	1.215	.965	1.531
Saltin-Grimby Scale physical activity level*	-.341	.069	24.406	1	**< .001**	**.711**	.621	.814
Resilience (CD-RISC) score*	-.102	.011	90.471	1	**< .001**	**.903**	.884	.922
Stress (PSS) score*	.172	.015	129.418	1	**< .001**	**1.187**	1.153	1.223
Satisfaction with the level of support from:								
Family*	.247	.070	12.315	1	**< .001**	**1.280**	1.115	1.470
Peers*	.305	.065	22.090	1	**< .001**	**1.356**	1.194	1.540
Faculty*	.679	.063	116.582	1	**< .001**	**1.972**	1.744	2.231
Academic or career advisor*	.424	.055	60.137	1	**< .001**	**1.529**	1.373	1.702
Satisfaction with the overall learning environment at DPT school*	.723	.066	118.458	1	**< .001**	**2.060**	1.809	2.347

Agreement with the statement:								
"I feel my education is a high priority for faculty"*	.675	.077	76.065	1	< **.001**	**1.964**	1.687	2.285
"My school promotes a collaborative rather than competitive environment for students"*	.502	.073	47.736	1	< **.001**	**1.652**	1.433	1.905

*significant at the .05 level

Odds ratios for burnout reflect the increased risk for burnout associated with a 1-unit decrease in satisfaction on the 5-point Likert scale for each support and learning environment question (see Method). For example, a 1-unit decrease (eg, choosing somewhat satisfied rather than very satisfied) in satisfaction with the overall learning environment is associated with a 2-fold increased risk of burnout. Odds ratios for burnout reflect the decreased risk for burnout associated with a 1-level increase on the 4-level SGPALS. For categorical data, the odds ratio represents the ratio of the odds of burnout occurring in one group to the ratio of the odds of burnout occurring in the referent group.

Factors that were statistically significant in the univariate analysis were then entered together into multivariate a logistic regression analysis with an alpha level of $\alpha = .0125$ to reduce type I error. Prior to multivariate analysis, collinearity was assessed between continuous variables to eliminate issues of multicollinearity. The tolerance value was greater than .1 at .806 and the VIF value was less than 10 at 1.24, and the variables were weakly to moderately correlated at $r = -.440$. Both continuous variables were included in the multivariate analysis.

The logistic regression model was statistically significant, $\chi^2(13) = 295.185$, $p < .001$. The model explained 27.2% (Nagelkerke R^2) of the variance and correctly classified 73.1% of cases. Of the 13 predictor variables only four were statistically significant: satisfaction with the level of support from faculty, satisfaction with the

overall learning environment, CD-RISC score, and PSS score (see Table 4.8). Decreased levels of support from faculty, decreased levels of satisfaction with the overall learning environment, and increased perceived levels of stress were associated with increased odds of developing burnout, while increased resilience scores were associated with decreased odds of developing burnout.

Table 4.8. Multivariate model: factors independently associated with burnout

Variable	*β*	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
							Lower Level	Upper Level
DPT school region (Northeast)								
Midwest	-.459	.193	5.639	1	.018	.632	.432	.923
South	.216	.176	1.509	1	.219	1.241	.879	1.751
West	-.501	.228	4.833	1	.028	.606	.388	.947
Saltin-Grimby Scale physical activity level	-.183	.078	5.418	1	.020	.833	.714	.972
CD-RISC score**	-.056	.012	20.640	1	**< .001**	**.946**	.923	.969
PSS score**	.109	.017	39.880	1	**< .001**	**1.115**	1.078	1.153
Satisfaction with the level of support from:								
Family	-.068	.086	.622	1	.430	.934	.789	1.106
Peers	.011	.084	.017	1	.896	1.011	.857	1.192
Faculty**	.352	.104	11.427	1	**.001**	**1.422**	1.159	1.743
Academic or career advisor	.034	.078	.189	1	.663	1.035	.888	1.205
Satisfaction with the overall learning environment at DPT school**	.349	.092	14.267	1	**< .001**	**1.417**	1.183	1.698
Agreement with the statement:								
"I feel my education is a	.058	.111	.274	1	.601	1.060	.852	1.318

high priority for faculty"								
"My school promotes a collaborative rather than competitive environment for students"	-.059	.093	.400	1	.527	.943	.785	1.132

**significant at the .0125 level

The four variables that were significant in the multivariate analysis were entered into a final logistic regression to develop an equation for predicting the development of burnout in DPT students (see Table 4.9). The final model was statistically significant, $\chi^2(4) = 266.827$, $p < .001$, explained 24.8% (Nagelkerke R^2) of the variance and correctly classified 72.1% of cases. The probability of a DPT student developing burnout can be calculated using the following equation: Log [p/(1-p)] = -2.871 - .06(CD-RISC total) + .103(PSS total) + .351(Satisfaction with support from faculty) + .353(Satisfaction with learning environment). For example, a student with low resilience (CD-RISC total = 27), high perceived stress (PSS total = 35), and low satisfaction with the level of support from faculty and overall learning environment at DPT school (Very dissatisfied = 5) would have a 93.3% probability of developing burnout. Conversely, a student with moderate resilience (CD-RISC total = 32), moderate perceived stress (PSS total = 25), and higher satisfaction with the level of support from faculty and the overall learning environment (Satisfied = 2) would only have a 30.8% probability of developing burnout.

Table 4.9. Final model: factors independently associated with burnout

Variable	β	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
							Lower Level	Upper Level
CD-RISC score	-.060	.012	24.819	1	< .001	.942	.920	.964
PSS score	.103	.017	37.258	1	< .001	1.108	1.072	1.146
Satisfaction with the level of support from faculty	.351	.079	19.745	1	< .001	1.421	1.217	1.659
Satisfaction with the overall learning environment at DPT school	.353	.085	17.431	1	< .001	1.424	1.206	1.680

DISCUSSION

The results of this study indicate that perceived stress, level of resilience, satisfaction with the level of support from faculty, and satisfaction with the overall learning environment at DPT school may influence the development of burnout in DPT students. Students who have higher levels of perceived stress, lower levels of satisfaction with the level of support from faculty, and lower levels of satisfaction with their overall learning environment at DPT school may be more likely to develop burnout, while students who have higher levels of resilience may be less likely to develop burnout.

In this study, 35.4% of DPT students were considered to have burnout using the OLBI-S (high exhaustion, high disengagement, or both). This is lower than the prevalence of burnout in medical students, which has been reported to be between 45-47% using the MBI (high exhaustion, high depersonalization, or both).[5,22] It is also lower than the prevalence of burnout reported by Williams et al, where DPT students with high exhaustion, high disengagement, or both increased from 43% at the beginning of a spring

semester to 78% at the end of the semester.[13] This difference could be related to a difference in cut-off scores that define burnout. Researchers who use the MBI often consider depersonalization scores of 10 or higher or exhaustion scores of 27 or higher to indicate burnout, while the OLBI-S does not currently have set cut-off scores.[8,22] Disengagement cut-off scores in this study were similar to those used by Williams et al, but the exhaustion cut-off scores determined by quartile analysis in this study were considerably higher.[13]

There was not a significant difference in mean exhaustion or disengagement scores when comparing students across years in a DPT program, and the percentage of students who were in the burnout vs non-burnout group were similar across years in a DPT program. This is in contrast with research assessing medical students, where the prevalence of burnout tends to increase with advanced years of training.[5] Williams et al also reported DPT students in year 2 were more exhausted and disengaged than those in year 1.[13] While the odds of developing burnout increased with advanced years of training in DPT students in the preliminary univariate analysis, the difference was not statistically significant in the current study. This study included DPT students from many different programs across the United States, and variation in curricula may also account for differences across programs.

A mix of individual factors (level of stress, level of resilience) and environmental factors (level of satisfaction with support from faculty, level of satisfaction with DPT school environment) significantly influenced the probability of developing burnout, which is consistent with findings from other studies. Stress is an unavoidable occurrence

while attending graduate school and working in the health care field. Since burnout is the result of a negative response to chronic stress, it is logical that perceiving stress to be unmanageable would influence the development of burnout. Stress (especially chronic stress) has also been linked to anxiety, depression, and post-traumatic stress disorder.[23] In a systematic review assessing medical students, the prevalence of high stress levels ranged from 31% to as high as 73%, and medical students with high stress levels were more than twice as likely to develop burnout.[24] In the 2010 study by Dyrbye et al, students who experienced more stressful life events and had higher levels of perceived stress were more susceptible to the development of burnout.[9] While the stress related to graduate school is often inherent, some aspects of stress reduction may be modifiable. DPT programs can assess factors, such as curricular load and class and exam schedules, to decrease student stress.

The current study surveyed students during a global pandemic and 80% experienced a shift to online learning in the previous semesters which likely increased stress and required adaptation for success. While this study shows that increased stress increases the odds of developing burnout, it also shows that having a higher level of resilience is protective against developing burnout. Resilience is the ability of a person, community, or system to withstand, adapt, recover, rebound, or even grow from adversity, stress, or trauma.[11] While some people appear to be inherently resilient, resilience is not something that somebody either has or does not have; it is a dynamic personality state that can be modified and is an attribute that can be strengthened (state and trait).[25] Resilience builds resources and increases the ability to cope with burnout and

stress.[26] Eley et al suggest that the failure or loss of resilience in physicians leads to burnout.[27] In contrast, Card states that burnout among physicians (and other health care workers) is the result of both avoidable and unavoidable suffering, and that it cannot be fixed through individual resilience training alone.[28] Health care organizations and work environmental factors play a large role in the development of burnout.

In this study the environmental factors had the greatest influence on the development of burnout, with the odds of developing burnout increasing by 1.421 and 1.424 for each 1-unit decrease in satisfaction with the level of support from faculty and satisfaction with overall learning environment, respectively. Similarly, Dyrbye et al reported that dissatisfaction with the learning environment and the perceived level of support provided by faculty had the strongest association with burnout among year 1 and 2 medical students.[8] Another study by Dyrbye et al reported that positive perceptions of the learning climate may be protective against the development of burnout, and that a high level of satisfaction with the overall learning environment was independently associated with not experiencing burnout.[9] It behooves DPT programs to assess the environmental factors that affect learning and the perceptions of faculty and advisor relationships to determine what curricular changes or faculty and student resources would improve the program climate and reduce student burnout. The targets of burnout interventions need to match the underlying causes of burnout. Based on the results of this study as well as previous studies, it appears that both individual-focused and learning environment-focused interventions should be utilized to address burnout.[29]

There were several limitations to this study. Currently, there are not widely agreed upon cut-off scores for the OLBI-S to categorize students into a burnout group like those that exist for the MBI. While technically burnout occurs on a spectrum, many research studies on burnout use cut-off scores to dichotomize participants into groups. Future research could utilize the OLBI-S to create cut-off scores to improve consistency across studies and make comparisons between studies easier. Though this study was exploratory in nature and included many factors in the primary regression, the final model only explained 24.8% of the variance and there are likely other factors that influence burnout that were not assessed by this study.

This study also has several strengths. It is the first study that we know of to assess burnout in DPT students from programs across the United States. It is also the first that we know of to assess factors that contribute to the development of burnout in DPT students and create an equation to predict the probability of a DPT student developing burnout. This study also utilized the OLBI-S to evaluate burnout, which is a free outcome measure and easier to access than the MBI.

CONCLUSION

Students who have higher levels of perceived stress, lower levels of satisfaction with the level of support from faculty, and lower levels of satisfaction with their overall learning environment at DPT school may be more likely to develop burnout, while students who have higher levels of resilience may be less likely to develop burnout. Focusing on individual factors such as building resilience and managing stress may help decrease the odds of developing burnout. DPT programs could also assess aspects of the

learning environment and evaluate the perceived level of support from faculty by students to see where changes could be made at the program level to help reduce the development of burnout in their students.

APPENDIX 4A

PSYCHDATA SURVEY ADDITIONAL QUESTIONS

Please indicate below which life events have occurred in the past 12 months and whether you consider those events to be positive or negative.

	Did not occur in the past 12 months	Occurred, considered a positive life event	Occurred, considered a negative life event
Marriage			
Divorce			
Having or adopting a child			
Death of a close family member			
Major personal illness			
Major illness in close family member or significant other			

Please rate your level of satisfaction or dissatisfaction with the level of support received from the following:

	Very Satisfied (1)	Satisfied (2)	Neutral (3)	Dissatisfied (4)	Very Dissatisfied (5)
Family					
Peers					
Faculty					
Academic or Career Advisor					

How satisfied or dissatisfied are you with the overall learning environment at your school?

1. Very Satisfied
2. Satisfied
3. Neutral
4. Dissatisfied
5. Very Dissatisfied

Please rate your level of agreement or disagreement with the following statements:

	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
I feel my education is a high priority for faculty					
My school promotes a collaborative rather than competitive environment for students					

CHAPTER V

FACTORS CONTRIBUTING TO BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

INTRODUCTION

Burnout is a syndrome resulting from chronic workplace stress that has not been successfully managed.[1–3] Though typically considered an occupational phenomenon, burnout can also occur in groups doing work-like activities such as students or athletes.[4] The gradual development of burnout is a dynamic and complex process that is influenced by numerous factors.

In 2014, Bodenheimer et al proposed the concept of the Quadruple Aim of health care, keeping the original goals of the Triple Aim (enhancing patient experience, improving population health, and reducing costs) while adding a fourth goal: improving the work life of health care providers.[5] The development of burnout in students might begin during their academic studies and continue as they transition into the workforce.[6,7] Prevention and management of burnout in the student population may help reduce the development of burnout later in their work life and may help achieve the Quadruple Aim by improving clinician well-being.

Few studies assessing burnout have been published with PT students, though many have been conducted with medical and nursing students. Two studies compared levels of PT student burnout at the beginning and end of a semester, with both studies finding increases in exhaustion and depersonalization/disengagement over the course of

one semester.[8,9] The study by Balogun et al assessed 21 PT students in their junior year attending the State University of New York Health Science Center at Brooklyn over the course of the 1994 spring semester, using a version of the MBI that they had modified for a previous study.[9] The authors found a significant change in emotional exhaustion from a moderate level at the beginning of the semester to a high level at mid-semester and end of semester. Depersonalization scores increased from the beginning of the semester to mid-semester and end of semester, but the changes were not significant, and scores remained at the "moderate" level at all time points. This study took place when PT education was at a baccalaureate level and may not be generalizable to today's students. The more recent study by Williams et al assessed 163 first- and second-year students from the Northern Arizona University DPT program (on both campuses) at the beginning and end of the spring 2016 semester, using the OLBI-S.[8] The authors found a significant increase in exhaustion and disengagement from the beginning of the semester to the end of the semester in both groups, with second-year students having higher exhaustion and disengagement levels compared to first-year students.

In studies with medical and nursing students, some individual factors that appear to contribute to the development of burnout include reduced level of physical activity, reduced level of social support, not experiencing positive life events, increased fatigue, increased stress, and decreased resilience.[6,10–13] Environmental factors that influence the development of burnout include grading scheme and perceptions of the learning environment.[10,12,14,15] The results from Study 2 of this dissertation assessing burnout in DPT students indicated that perceived stress, level of resilience, satisfaction with the

level of support from faculty, and satisfaction with the overall learning environment at DPT school may influence the development of burnout in DPT students.

Nearly all published studies assessing burnout and factors related to the development of burnout are quantitative in nature and frequently consist of outcome measures and surveys. Speaking directly with students may shed light on their perception of burnout and what factors they feel affect their well-being while in DPT school; these perceptions might not be captured by surveys. This study utilized a qualitative research design using individual interviews and coding of student responses to questions to assess DPT student perceptions of burnout and well-being.

Specific Aim and Research Question

The aims of this study were to explore DPT students' perceptions of factors that promote or impede well-being during their DPT program as well as to explore the students' definition of burnout. The research question was "What are DPT students' perceptions of burnout and well-being?"

METHOD

Participants

PT students were recruited via convenience sampling from those who volunteered through the Psychdata survey from Study 2. A total of 522 students provided their email addresses in Study 2. Students who volunteered to participate in the qualitative portion were stratified by group (burnout and non-burnout from Study 2) and geographic region. Once stratified, students were randomized using Microsoft Excel. Students were selected in the order that they were randomized and were contacted via email to set up an

interview time. If students did not wish to participate, did not answer the email, or did not answer the interview call, the next student on the randomized list was contacted. This method continued until 20 interviews were conducted.

Instrumentation

The PI conducted semi-structured interviews with participants using Zoom with the video-sharing feature off for confidentiality. Interview prompts were modified from those used by Ratanawongsa et al with physician residents (see Table 5.1).[16] The interviews were audio-recorded and transcribed initially using Zoom and then checked for accuracy by the PI. Each participant was emailed a copy of their transcribed interview to review for accuracy. Recorded interviews and transcriptions were stored on a password-protected computer in a password-protected file accessible only by the PI. Interviews ranged from 20-40 minutes. The participants were given pseudonyms to help maintain confidentiality.

Table 5.1. Semi-structured Interview Prompts

When I say the word burnout, what does it mean to you or how does that word make you feel?
What do you do to avoid burnout?
What do you do to stay healthy?
What makes it hard for you to maintain your well-being?
What aspects of PT school make it hard for you to maintain your well-being?
What aspects of PT school help you maintain your well-being?
Do you have any other comments or suggestions?

Data Analysis

Using a grounded theory approach, the PI coded interview notes and transcriptions to determine themes using NVivo 12 Pro, a qualitative data analysis software program. Interview responses were reviewed throughout the process to assess

for data saturation. To improve rigor, the PI used reflective journaling and constant comparative analysis throughout the data collection process. Coding and themes were reviewed by two other researchers with experience with qualitative research until a consensus was reached.

RESULTS

Twenty interviews were conducted between January 2021 to April 2021 with 15 female and 5 male participants. There was an even split between participants who were in the burnout group and non-burnout group with 10 participants in each group. For DPT school region, the West had the most representation with eight participants while the Northeast had the least representation with two participants. Additional demographic information can be found in Table 5.2.

Table 5.2. Demographic Information

		Total *N* = 20 (100%)
Gender	Female	15 (75%)
	Male	5 (25%)
Age Group	< 25	9 (45%)
	25-28	5 (25%)
	> 28	6 (30%)
Race	Asian	2 (10%)
	Black or African American	1 (5%)
	White	15 (75%)
	Chose not to disclose	2 (10%)
Ethnicity	Not Hispanic or Latino or Spanish Origin	20 (100%)
Married	Yes	6 (30%)
	No	14 (70%)
Children	Yes	2 (10%)
	No	18 (90%)
Year in DPT School	First Year	12 (60%)
	Second Year	7 (35%)
	Third Year	1 (5%)

	Northeast (CT, MA, ME, NH, NJ, NY, PA, RI, VT)	2 (10%)
	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	6 (30%)
DPT School Region	South (AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV)	4 (20%)
	West (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY)	8 (40%)
Type of DPT Program	Hybrid due to COVID-19	20 (100%)
	None	3 (15%)
Total Debt (School and Personal)	$1 – $49,999	8 (40%)
	$50,000 – $99,999	6 (30%)
	>$100,000	3 (15%)
Currently Working for Income	Yes	6 (30%)
	No	14 (70%)
Burnout Group	Burnout	10 (50%)
	Non-Burnout	10 (50%)

Data was organized into three major themes: burnout experience, factors that negatively affected well-being, and factors that positively affected well-being. Each theme contained three subthemes that are outlined in Table 5.3.

Table 5.3. Themes and Descriptions

Theme	Subtheme
Theme 1: Burnout Experience DPT students described their thoughts and feelings regarding their experiences with and perceptions of burnout.	Subtheme 1A: Exhaustion A depletion of energy and resources. Includes emotional, mental, and physical exhaustion. Subtheme 1B: Disengagement Emotional withdrawal from school. Includes a loss of motivation, a loss of passion, boredom, and numbness. Subtheme 1C: Chronic Overload A culmination of tasks, pressure, and expectations without a break to recover.
Theme 2: Factors That Negatively Affected Well-Being	Subtheme 2A: Unmanageable Stress Overwhelming psychological or emotional strain. Some stressors mentioned include perceived pressure from peers, grades, lack of control, and finances.

DPT students described internal and external factors that negatively affected their well-being while in DPT school.	Subtheme 2B: Excessive Workload A build-up of tasks, including studying for tests and exams, completing assignments, and completing clinical hours. Subtheme 2C: Time Pressures Too many tasks to complete in a short time frame, lack of time to complete everything that needs to be accomplished, or lack of a break to recharge.
Theme 3: Factors That Positively Affected Well-Being DPT students described internal and external factors that had a positive impact on their well-being while in DPT school.	Subtheme 3A: Prioritizing Time The ability to determine which tasks are more important than others, follow a schedule, and utilize time management skills to maintain a school-life balance. Subtheme 3B: Support Help and encouragement from others, including family, friends, classmates, and professors. Subtheme 3C: Self-Awareness The ability to perceive your emotions and understand your tendencies in certain situations, as well as assess how your emotions, thoughts, and actions align with your values and passions.

Each of the three main themes was influenced by the timing of this research, which took place during the COVID-19 pandemic. All students interviewed attended DPT programs that shifted from a traditional model to a hybrid model. Many students discussed the effects of the pandemic during the interview process, especially the impact of virtual learning due to the shift to hybrid DPT programs. These effects can be found embedded within each theme.

Theme 1: Burnout Experience

This theme captured how DPT students described their thoughts and feelings regarding their experiences with and perceptions of burnout while in DPT school and consisted of three subthemes: exhaustion, disengagement, and chronic overload.

Subtheme 1A: Exhaustion. Multiple aspects of exhaustion were mentioned by the students when asked to describe their experience with burnout, including emotional, mental, and physical exhaustion. These different aspects of exhaustion were often mentioned together, such as when Ethan described his burnout experience:

> …it just came to a point where I just knew physically I was just so burned out that I, mentally…I wasn't able to keep up. Like I wasn't able to study as effective as I, as I used to, I wasn't retaining information as, as much as I should have.

Julie also described multiple aspects of exhaustion when she stated, “Burnout to me, is just, it's beyond a physical exhaustion and is more of like, mental exhaustion.” Sarah was more affected by the emotional aspect of exhaustion which she described as:

> For me it's kind of when, like, physically you're kind of running on fumes. But I think with burnout the thing that gets to me more is the, the emotional aspect of it…I think it's definitely a combination of those two. The emotional aspect is just what gets to me more.

Subtheme 1B: Disengagement. Another aspect of the burnout experience described by students was disengagement, or an emotional withdrawal from school. Though the students did not specifically use the word “disengagement” when describing

their burnout experience, their description fit with the definition used in the literature.[3,17] This was often characterized as a loss of motivation and passion as well as withdrawal or distancing from schoolwork. As Savannah stated, “To me, burnout is…trying hard for a long time and…you kind of just work yourself until you don't really have the same passion for whatever you're working on that you did when you started out.” The disengagement aspect of burnout was also described as a lack of motivation, such as when Grace stated, “In my mind it’s just, probably like a lack of motivation or a lowered capacity to do the work required.” Rebecca described her experience with burnout as a progression of symptoms, starting with numbness and ending with withdrawal, when she stated:

> Yeah I suppose numbness is like the initial phase. That's like a warning sign. And then, when like, resentment starts to bleed in, that's like a progression. And then if I start self-sabotaging efforts, that's like red red flag, way burned out. I don't know if it's typical of all students, but unfortunately one of my responses to stress is usually to withdraw.”

Subtheme 1C: Chronic Overload. A final aspect of burnout that students consistently mentioned was their workload, stating they were pushed beyond their limits by having too much to do and not enough time to complete everything or recover from the work. Madison described the feeling of never being caught up when she stated:

> I had a lot of exams all in the same week or the following, and so just prioritizing one after the other, putting one off and having to catch up. I felt like I was never caught up, and so, I think fear kind

of set in. And I think that's what made me stressed and overworked and burnt out.

Part of the overload came from sustained effort over time, as Iris explained by stating, “The mental workload of school can be really hard and very hard to sustain for the full semester.” Andrew mentioned the lack of a break when he said, “When I think of burnout I think of, just…kind of just like non-stop work, just can't catch a break. Kind of just one thing after another.” Being pushed over her limit was described by Sasha when she stated, “Burnout, for me, is reaching not your limit but exceeding your limit, physically, mentally, and emotionally, for me.”

Theme 2: Factors That Negatively Affected Well-Being

Theme 2 described which factors DPT students felt negatively affected their well-being while in DPT school. Many of the factors that negatively affected the students’ well-being overlapped with their description of and experiences with burnout.

Subtheme 2A: Unmanageable Stress. Stress was a main factor that made it hard for DPT students to maintain their well-being. There were different kinds of stressors mentioned, such as when Rebecca stated, “I mean it's…increased scholastic stress, academic stress, with like, increased financial stress, and increased expectations with, without an increase in, you know, a reward for that behavior.” Another stressor for students was a lack of control. Sasha explained:

> I guess just lack of control that I sort of associate with PT school. There is like, a huge difference between undergrad and grad school. In undergrad you create your own schedule, and even going to class is really up to you.

> As well as what you wear, so part of the really stressful part of it is like I, I felt that when I started PT school I had no control. I had no control over my schedule, it was now I had to go to school from eight five, which I'm not used to, with no breaks, and so that was stressful. I was told what to wear. And you know, like if you have to dress up for lab class, you have to dress up in scrubs and, and so I guess I get some of my mental health from being able to dress myself. And I felt like I had no control over that, and you know, not being able to take breaks from classes, and having to show up to every single class, regardless of how helpful you think that might be.

Pressure from other DPT students was another stressor mentioned, sometimes within cohorts and sometimes between cohorts. For example, Katherine states, "I think a lot of my stress actually came from, not from the professors or, or the program itself, but from peers. And not, so not necessarily even my own cohort, but maybe the cohort ahead." She went on to expand and say:

> The negative or the scary stories coming from people who have already kind of done what we were going to do, and that stress, not necessarily me, but that kind of gets told to the other people in your cohort. And then you talk to the rest of your cohort, and then they're stressed out, and then you get stressed out by, by proxy I guess.

Finances and debt also contributed to stress. Jenna explained:

> Because the idea of like, graduating in something that I really want to do, and am really passionate about, but having like this huge anchor weighing

> me down of debt, and then working in a PT mill where I'm just grinding out like 15 patients a day and I'm getting paid, for a PT a minimal amount of money, is like, it's very stressful." She also mentioned how debt was affecting multiple aspects of her life, stating, "And it's something that's going to bleed into every other aspect of my life, like throwing a wedding, buying a house, having kids, all of that is going to be impacted by being like, nearly a quarter of a million dollars in debt.

Subtheme 2B: Excessive Workload. The large volume of assignments and tests in a DPT program was another factor that negatively impacted students' perception of well-being. When listing the number of tasks over a one-month time period, Amy stated:

> The month of March was absolutely insane. Like we had eight midterms, four of them were practicals, four of them were written like, in the month of March. So we had like two exams a week, and then that's on top of like our reading quizzes, and then our lab exams. And it was just like, there was never a day that you could even just take a breath.

For some students, the increase in workload was linked to the COVID-19 pandemic as schools made modifications to course schedules and delivery of content. Heather described her experience during the fall of 2020, stating:

> The rigor of coursework is, you know, it's expected to be difficult, but in our fall semester we had about 21 graduate credits. Because they had to take some of our summer anatomy class, the surface anatomy, and push it to the fall. Yeah, that was just overwhelming…it kind of set us all up for

> failure, honestly, in terms of everyone being just completely wiped and feeling like they are slaves to school, essentially.

Part of the seemingly excessive workload may be due to how assignments and tests are scheduled. At the end of an interview with Sasha, when asked if she had any additional topics that were important to mention, she stated:

> Having teachers be mindful of what is on our plates at the moment. And like, the compounding assignments and exams that we're faced with. And being flexible with due dates for assignments or exams or whatever it might be that is causing us immense amount of stress. And a lot of it is just so unnecessary, there's no reason for like, one day to be, for us to have like three exams and one big project, and two papers due on the same day as like, a midterm, and we have another final like, the day after.

Subtheme 2C: Time Pressures. When asked what makes it hard to maintain her well-being, Amy put it bluntly: “Having class from eight AM to six PM.” She went on to explain:

> I mean, if you think about it, like we have 40 hours of class time a week, so that's like having a full-time job, but then we're constantly studying. So like we're working much, much more than a 40 hour week. So it's like, how do you expect people to get their laundry done? How do you expect people to have dinner ready, like if they have a family or anything like that, you know?

When asked the same question, Iris also put it simply by stating, “Lack of time.”

Many students also mentioned that the COVID-19 pandemic affected their time off, with several students stating their normal breaks were reduced or cancelled. Savannah described how her school altered the schedule, stating:

> One thing that was different, like, this past semester and this coming semester is that like, we didn't have breaks, because everything was condensed and they don't want us going home and getting sick potentially. So we didn't have any like spring, we're not going to have a spring break. And we didn't have the usual, like, holidays off before Thanksgiving.

Theme 3: Factors That Positively Affected Well-Being

This final theme included which factors DPT students felt had a positive impact on their well-being while in DPT school. Subthemes included prioritizing time, support, and self-awareness.

Subtheme 3A: Prioritizing Time. When discussing factors that had a positive impact on their well-being, DPT students described that they prioritized their use of time to maintain a school-life balance. Planning ahead and managing time were key strategies mentioned. Joshua described his approach, stating:

> Since we have like a large workload at times, just trying to be good at time management. So like knowing I have to get an assignment done by like, Sunday, try to plan it out. Other assignments that are due before that, try and do one. And try and manage everything where I can still like, go to the gym, still do some social activities to keep my mental and physical well-being.

Michelle used a similar strategy, stating:

> I'm definitely like a big planner person, my planner's like, jammed full. And I'm definitely like, a person to like, schedule out their whole week...homework, tests, all that…finding time throughout the week to exercise…also finding time just outside of school…and doing other fun things like with my roommates, or just getting outside, or whatever it is that week.

Subtheme 3B: Support. Receiving support from others positively influenced the well-being of the students interviewed. Faculty support was mentioned frequently as a factor that helped students maintain their well-being, such as when Grace stated:

> Honestly, a lot of it is the faculty. I feel like since we're all in this field and we see, you know, what exercise does for, you know, mental health and for, for well-being. The faculty work really hard to ensure that people, you know, are getting out and like, doing things.

Andrew described how fitting in with his DPT cohort helped him, stating, "It just felt like I fit in and it felt that I was actually surrounded by people that I really had something in common with." Others relied on their families for support, such as Sasha who stated, "Social support, family support, that was huge." The switch to virtual learning because of the pandemic was challenging for some students as it took away an aspect of social support from them. Katherine describes how the transition to virtual learning affected her, saying:

> It was socially satisfying to actually go to school and be around the cohort, be around professors and instructors on a daily basis. That was more motivating for me, and then taking that away, I think it kind of took away, in the beginning, anyway, it took away kind of my social support.

Subtheme 3C: Self-Awareness. Students who were able to identify their warning signs for burnout described being better able to recognize when there was a problem that needed addressing. As Rebecca stated:

> I think the earlier you, in any situation, but in general overall, the faster you can learn your warning signs for burnout, the better off a chance you have of intervening. And that it's a skill that takes time and years of your life to learn how to manage stress. And there's lots of different ways to do it and so to have multiple strategies is advantageous.

Expressing emotions was also helpful for students. Julie described this by saying:

> Sometimes I feel the need to just let your emotions out, you know? Like, whether it be with a friend and having a conversation, or you know, even just maybe shedding a tear or two if you need to? Like, I found that just getting that frustration out, outside of you, outside of yourself, and not, not putting it on someone else, but just sharing it. Sharing that load, that burden with someone else. Um, and prayer, I think, has been very important to me and my faith is important as well. So that's a, that's another outlet that I feel I can kind of, you know, maybe vent some frustrations, or you know, whatever I may be feeling.

Another aspect of self-awareness that had a positive impact on DPT student well-being was seeing value and purpose in the work. When Amy was discussing what parts of DPT school that were helpful to maintaining well-being, she said:

> Just like the fact that we're working towards something bigger than me, like I literally, like everything we learn is like is about the patient and what the patient needs. And like, how can you make someone's day and how can you make someone's life that much like higher quality, you know, that higher quality of life. And it's like, great to know that we're doing something like meaningful.

Maintaining perspective and remembering why they wanted to become a PT was helpful for students. As Cody stated:

> I think the most important thing is just understanding that, like, why you got into PT school. Like you knew going, you know going into PT school, it's probably going to be the hardest thing you've ever done in your life. And so like, when you're feeling burnt out, and like, there's just no end in sight for assignments or exams, like understand that it's all to get us all to understand that, like, what we need to succeed in this field. And you did it because you were passionate about it, you know? You kind of, kind of find that, that first drive that you had when you signed up for it, when you're really, uh, in the, in the ditches there, like later on.

DISCUSSION

The results of this study indicate that DPT students experienced burnout as a combination of exhaustion, disengagement, and chronic overload. Factors that negatively affected well-being while in DPT school included unmanageable stress, an excessive workload, and time pressures. Factors that positively affected well-being while in DPT school included prioritizing time, support from faculty, friends, and family, and self-awareness.

Exhaustion and disengagement are considered the core factors of burnout.[7,18,19] According to the creators of the OLBI, exhaustion is defined as a consequence of intensive physical, affective, and cognitive strain as a long-term consequence of prolonged exposure to certain job demands, while disengagement refers to distancing oneself from one's work and experiencing negative attitudes toward the work object, work content, or one's work in general.[17] The students interviewed for this study described both of these factors when discussing their own experiences and perceptions of burnout. Sixteen of the twenty students interviewed mentioned exhaustion or extreme fatigue when defining burnout and their descriptions were multidimensional, including physical, mental, and emotional aspects. Several researchers argue that exhaustion is the hallmark of burnout, and multiple burnout outcome measures focus exclusively on exhaustion.[20–22] The students described more than just exhaustion, however, they also described disengagement. This was often characterized as a loss of motivation and passion as well as withdrawal from schoolwork.

Another theme that emerged from the students' description of their burnout experience was chronic overload: a culmination of tasks, pressures, and expectations without a break to recover. This has similar ties to definitions of burnout found in the literature, including "a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed"[1] or "the result of a chronic ongoing reaction to one's work and a negative affective response to prolonged impairing stress."[2,3] The students frequently mentioned how it was the build-up of tasks and pressure over time that contributed to their feelings of burnout, confirming the idea that burnout is often a chronic issue. The students also described that when they did not have a chance to recover from their work, their feelings of burnout lingered from one semester into the next.

When the students were asked about what made it hard to maintain their well-being, three themes emerged from the data: unmanageable stress, excessive workload, and time pressures. These factors overlapped considerably with the students' description of burnout, which makes sense since burnout is on the opposite end of the spectrum from well-being.[14] Chronic stress is a key factor in the development of burnout and one that had a negative impact on the students. Grades were a stressor mentioned often by the students, specifically stress associated with maintaining a certain GPA and getting letter grades as opposed to a pass-fail grading system. Three students had the option to take some of their classes as pass-fail during the pandemic and stated it dramatically lowered their stress. Similar findings were found with medical students. Medical students in pass–fail curricula were less likely to have burnout than students not in pass–fail curricula,

even when controlling for multiple other curricular factors, including time spent in didactics and clinical experiences, number of exams, and length of vacation.[15] Other studies provided evidence that moving to a pass-fail curriculum can improve medical student well-being.[23,24]

Another stressor mentioned by the students was finances. Several students discussed the stress and anxiety related to the amount of their debt. Nine of the 20 students interviewed had more than $50 000 in debt, with three students owing over $100 000. The burden of student debt is a pervasive issue for PT students and affects their quality of life.[25] In a study by Ambler with 86 entry-level PTs from Florida in 2016, the mean debt-to-income ratio for the entry-level PTs was reported to be 197%, with a majority of that debt coming from DPT education costs.[26] In a 2018 article by Shields and Dudley-Javoroski, the authors recommend that students should carefully consider the amount of debt they are willing to assume in order to obtain a DPT degree, because at debt levels exceeding $266 000, the modelled economic value of a physical therapy career no longer exceeds the economic value of a bachelor's degree.[27]

Students also reported stress from peers. This could be due to an increase in fear of failure after learning about difficult challenges in future classes from DPT students in cohorts ahead. Stress from peers may also be related to the idea of social perfectionism, or people's perception that others evaluate them stringently and have unrealistic standards for them.[28] Several students interviewed said they had perfectionistic tendencies. Several others mentioned imposter syndrome, where they felt like they were

not sure they were qualified to be there or that they were not doing as well as their peers were doing in school.

Other factors that negatively impacted DPT student well-being were excessive workloads and time commitments, which often went hand in hand. Students reported struggling when they felt they were unable to keep up with the amount of material they needed to learn. They also had difficulty when assignments and tests were stacked up with little flexibility to arrange their schedules and adjust the workload. Due to the pandemic, several students reported that their programs modified course schedules to fit in content. This increased the credit load for several students, with one student reporting she had 21 credits in one semester. Other students had normal holiday breaks shortened or cancelled altogether. The lack of time to recharge left many students feeling burned out. The time commitment required to be in class was another factor as many students reported they were expected to be in class for 40 hours a week, leaving little time for other activities. The time commitment to coursework and studying outside of class was also a burden for students. The shift to virtual learning due to the pandemic was a positive factor for some students as it allowed them time for other activities, such as exercising or doing household chores between classes and decreasing the amount of time spent getting ready for school or commuting.

There were several factors mentioned by the students interviewed that had a positive impact on their well-being. Students reported that prioritizing their time helped them maintain a school-life balance. They did this by planning ahead and using their time to carry out what was important to them, as well as avoiding procrastination with

studying and assignments. Some students reported prioritizing strategies to maintain their health, such as scheduling time for exercise and sleep. When students who succeeded at prioritizing their time did take time away from schoolwork, they did not feel guilty about needing to recharge. Several students reported struggling with this skill, stating they knew they needed a break from school, but when they took time off from studying, they felt guilty or could not fully relax or enjoy their time away. Support from others was another factor that had a positive impact on DPT student well-being, especially support from faculty, friends, and their DPT cohort. In Study 2, satisfaction with the level of support from faculty had a significant influence on the development of burnout, with the odds of developing burnout increasing by 1.421 for each 1-unit decrease in satisfaction with the level of support from faculty. Similar results were found among year 1 and 2 medical students.[11] Feeling supported by faculty members and the DPT cohort may boost well-being and defend against the development of burnout in DPT students. In studies with medical students and residents, those who reported higher levels of social support were less likely to have burnout symptoms.[12,29]

Finally, self-awareness was a factor that had a positive impact on DPT student well-being. Self-awareness is an aspect of emotional intelligence and includes the ability to accurately perceive one's own emotions in the moment and understand one's tendencies across situations.[30] The students who described how they were able to recognize when they were developing burnout symptoms were better able to address those symptoms and also better able to manage their reactions to stressful situations. Several students described not realizing they were burned out until the chronic stress had

passed. Measuring burnout and other aspects of well-being during the curriculum may help improve awareness and can also help learners more accurately self-calibrate their own well-being, which may promote health behavior change and help-seeking behavior before distress is severe.[14] People high in self-awareness are remarkably clear in their understanding of what they do well, as well as what motivates and satisfies them.[30] Students who could see the "why" behind the work they were doing reported that it helped them maintain their well-being.

There were several limitations to this study. Selection bias may have affected the results of the study, as students who volunteered to participate in the interview may have had strong opinions on the subject of burnout and well-being or were driven to share their personal experience. While the data was stratified by burnout group and region, there were only two students from the Northeast region, while the West had the most representation with eight students. Another limitation is that this study was conducted in the midst of the COVID-19 pandemic. While the results of this study provide valuable information regarding DPT student burnout and well-being, it is likely that the circumstances surrounding the pandemic influenced the results and may not be generalizable to non-pandemic times.

CONCLUSION

DPT students experienced burnout as a combination of exhaustion, disengagement, and chronic overload. Factors that negatively affected well-being while in DPT school included unmanageable stress, an excessive workload, and time pressures. Factors that positively affected well-being while in DPT school included prioritizing

time, support, and self-awareness. It may be beneficial for DPT programs to use validated measurement tools to assess the extent of the burnout problem and the potential contributory factors, assess the total clinical and academic workload expected of learners with the goal of achieving a reasonable workload that is sustainable, and conduct annual reporting on the professional well-being of its learners, including the outcomes of interventions taken to improve learner professional well-being.[14]

CHAPTER VI

THE CLINICAL RELEVANCE OF ASSESSING BURNOUT AND WELL-BEING IN PHYSICAL THERAPIST STUDENTS

Burnout is a negative affective response to chronic work stress and the development of burnout is a dynamic and complex process that is influenced by numerous factors. The concept of burnout affects more than just those who do "people work" and pertains to other occupations, including groups doing work-like activities such as students. The purposes of this dissertation were to determine the levels of burnout in DPT students, investigate individual and environmental factors that may influence the development of burnout, and assess students' perceptions of burnout and well-being while they are enrolled in a DPT program. Prevention and management of burnout in the student population may help reduce the development of burnout later in their work life and may help achieve the fourth pillar of the Quadruple Aim: improving the work life of health care providers.

Study 1 assessed test-retest reliability of the student version of the OLBI-S and convergent validity of the OLBI-S with the current gold standard, the MBI. The MBI has been criticized due to issues with the measure, including its three-factor structure and the unidirectional wording of questions. The MBI is also protected by copyright and distributed by a commercial publisher at a cost. The OLBI-S was developed in response to the criticisms and psychometric limitations of the MBI and is free to use. Forty-five students from one DPT program completed the MBI-GSS and the OLBI-S, then one

week later 42 of the 45 students completed the OLBI-S a second time. Utilizing intraclass correlation coefficients and Bland-Altman plots to assess reliability and Pearson's correlations to assess validity, the OLBI-S was found to have excellent reliability and good validity. Based on the findings of this study, the OLBI-S could be considered as a reasonable, free, alternative outcome measure to the MBI-GSS to measure burnout in DPT students.

Study 2 was a cross-sectional survey of DPT students from across the United States. The purposes of this study were to assess 1) the burnout scores and distribution among burnout groups for different classes of DPT students by graduate year (first-, second-, and third-year students) as well as 2) which individual and environmental factors were associated with the development of burnout in DPT students. All DPT programs in the United States with DCE email addresses (N = 231) were contacted in October 2020 requesting that the DCEs send a recruitment email to their DPT students with a Psychdata survey link. A total of 1 480 responses were received, and the 1 340 responses that contained complete data were included in the study. The Psychdata survey included demographic questions, the OLBI-S, the SGPALS, the 10-item CD-RISC, the 10-item PSS, and additional questions regarding student characteristics, perceived level of support, and DPT school learning environment.

To determine if burnout levels are different among students in different years in a DPT program, two one-way independent ANOVAs were conducted, one for each of the OLBI-S subscales (exhaustion and disengagement) compared to year in a DPT program (first, second, third). There was not a significant difference among students in different

years in a DPT program for either the exhaustion subscale ($F(2,1334) = .568$, $p = .567$) or the disengagement subscale ($F(2,1334) = 1.992$, $p = .137$) of the OLBI-S. Next, cut-off scores were determined according to quartiles for the exhaustion and disengagement subscales and then students were categorized into four subgroups based on their score severity. The burnout group was defined as having high exhaustion, high disengagement, or both, and 35.4% of DPT students fell into the burnout group.

After the DPT students were dichotomized into two groups (those with burnout and those without burnout), a simple logistic regression was conducted for numerous variables, 13 of which were found to have had a significant influence on burnout group category. These 13 variables were then entered into a multivariate logistic regression analysis, where four variables remained significant. The four remaining variables were entered into a final model to develop the following equation to predict the development of burnout in DPT students: Log [p/(1-p)] = -2.871 - .06(CD-RISC total) + .103(PSS total) + .351(Satisfaction with support from faculty) + .353(Satisfaction with learning environment). Decreased levels of support from faculty, decreased levels of satisfaction with the overall learning environment, and increased perceived levels of stress were associated with increased odds of developing burnout, while increased resilience scores were associated with decreased odds of developing burnout.

Study 3 utilized a qualitative approach to assess DPT student perceptions on burnout and well-being. A qualitative design was employed to speak directly with 20 students who volunteered to be interviewed based on an optional question on the survey conducted during Study 2. The purpose of Study 3 was to determine if student

perceptions of burnout and well-being were adequately captured by the quantitative survey of Study 2. The students' descriptions of their experiences with and perceptions of burnout matched closely with the literature and included feelings of exhaustion, disengagement, and chronic overload. Factors that negatively affected well-being while in DPT school included unmanageable stress, an excessive workload, and time pressures, while factors that positively affected well-being while in DPT school included prioritizing time, support, and self-awareness.

The results from these projects can be utilized in future research. The results from Study 1 indicated that the OLBI-S was a reliable and valid outcome measure to assess burnout in DPT students. Future studies with DPT students could use the OLBI-S as a free alternative to the MBI. Results from Study 2 utilized quartiles to group DPT students into burnout categories. DPT programs could use the OLBI-S with their students to assess burnout and could compare their students' scores with those from this nationwide study. The current gold standard, the MBI, has established cut-off scores that are used by different populations and is becoming more consistently utilized in the literature. Future studies may want to establish set cut-off scores for the OLBI-S similar to those that exist for the MBI to help limit heterogeneity of results.

The results from Studies 2 and 3 could be utilized to develop interventions to improve the well-being of DPT students. Faculty support was a major factor that affected DPT student well-being as found by both Study 2 and Study 3. Students who reported decreased levels of support from faculty were more likely to develop burnout according to Study 2, and students in Study 3 mentioned support, including support from faculty, as

a factor that positively affected their well-being while in DPT school. Faculty support included faculty being encouraging to DPT students, being approachable and open to listening to students regarding school-related or personal problems, and providing formal and/or informal check-ins to make sure students were taking care of themselves. A factor negatively affecting well-being that was found to be significant in both Study 2 and Study 3 was high perceived levels of stress. Major stressors mentioned included maintaining a certain GPA and getting letter grades, financial stress, and stress from peers. Stress from peers often came in the form of comparison, such as students not feeling as smart or as capable as their peers. Students also reported that seeing their classmates become distressed over grades or hearing about negative school experiences from cohorts ahead could cause them to feel increased stress. DPT programs could consider a pass-fail grading system to help minimize student stress. DPT programs and their respective universities could also assess ways to minimize financial stress on students, such as freezing tuition increases, reducing the number of credits required, or offering scholarship opportunities. Students should improve their financial literacy and should also carefully consider the amount of debt they are willing to assume in order to obtain a DPT degree. DPT programs could also offer opportunities to foster connection and support amongst DPT cohorts. DPT programs and students alike could work to improve individual characteristics, such as self-awareness, stress management, and resilience.

According to results from Study 3, other factors that negatively impacted DPT student well-being were excessive workloads and time commitments. DPT programs could decrease the credit load required or disperse the credits evenly among semesters to

help balance the load. DPT programs and faculty could also allow for some flexibility with scheduling exams and assignments, so the workload is distributed across the semester and avoid pile-ups of exams and assignments. Perhaps DPT students could be given the opportunity to voice their concerns regarding scheduling, or DPT programs could explain the reasoning behind scheduling things a certain way to allow for transparency and improve communication between the program, faculty, and students. Many DPT programs shifted to a hybrid model during the pandemic and therefore many of the scheduling imbalances and overload may be due to that phenomenon. Aspects of the hybrid model may be worth keeping, such as having some classes in-person while allowing for other classes to take place synchronously or asynchronously in a virtual environment which may help the students better manage their time. Students who felt virtual learning was a positive factor for them reported that it allowed them time for other activities, such as exercising or doing household chores between classes and decreasing the amount of time spent getting ready for school or commuting.

While these projects gave insight into the extent of burnout in DPT students as well as contributing factors, no interventions were utilized to decrease burnout or improve well-being. Future studies could use the information gleaned from these three studies to develop interventions and assess their effectiveness on improving well-being in DPT students. Further studies could also assess DPT students over time to see if burnout continues to follow them into their work life or if interventions to improve learner well-being are effective in improving their work life.

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APPENDIX A

APPROVAL LETTER FOR CHAPTER V

Texas Woman's University
Institutional Review Board (IRB)
irb@twu.edu
https://www.twu.edu/institutional-review-board-irb/

September 21, 2020

Allison Smith
Physical Therapy - Houston

Re: Initial - IRB-FY2020-390 Burnout and Well-Being in Physical Therapist Students

Dear Allison Smith,

The above referenced study has been reviewed and approved using expedited review procedures on September 19, 2020 by the TWU IRB - Houston operating under FWA00000178. If you are using a signed informed consent form, the approved form has been stamped by the IRB and uploaded to the Attachments tab under the Study Details section. This stamped version of the consent must be used when enrolling subjects in your study.

Note that any modifications to this study must be submitted for IRB review prior to their implementation, including the submission of any agency approval letters, changes in research personnel, and any changes in study procedures or instruments. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All modification requests, incident reports, and requests to close the file must be submitted through Cayuse.

Approval for this study will expire on December 31, 2021. A reminder of the study expiration will be sent 45 days prior to the expiration. If the study is ongoing, you will be required to submit a renewal request. When the study is complete, a close request may be submitted to close the study file.

If you have any questions or need additional information, please contact the IRB analyst indicated on your application in Cayuse or refer to the IRB website at http://www.twu.edu/institutional-review-board-irb/.

Sincerely,

TWU IRB - Houston