REVIEW

A Scoping Review of Well-being Assessment and Interventions in Student Pharmacists

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Objective. To review the literature assessing student pharmacist well-being and the impact of well-being associated interventions.

Findings. Of the 15 studies included, six assessed student pharmacist well-being while nine evaluated the impact of a well-being intervention. There are various approaches to assessing student pharmacist well-being. The body of literature suggests poor student pharmacist well-being overall. Since well-being is multifaceted and individualized, some pharmacy schools identified various ways to incorporate tailored well-being activities, including mindfulness, into required, elective, and co-curricular experiences within the Doctor of Pharmacy program, with varying outcomes.

Summary. This review highlights the limited and variable information available on the assessment of student pharmacist well-being as well as unique strategies to incorporate well-being initiatives into the doctor of pharmacy curriculum. Schools of pharmacy should identify student pharmacist well-being needs through a standardized well-being assessment instrument and provide meaningful well-being resources and interventions within the curriculum. There is a growing need for faculty to invest in student pharmacist mental wellness in addition to academic success. Future accreditation Standards will inform the Academy on how to advance well-being initiatives.

Keywords: Student pharmacist, well-being, wellness, mindfulness, curriculum

INTRODUCTION

Well-being is a state of health encompassing the physical, emotional, and mental conditions of an individual. In 1954, the World Health Organization (WHO) originally defined health as “not merely the absence of disease or infirmity, but a state of complete physical, mental, and social well-being.”¹ The WHO later updated the definition to “a state of well-being in which every individual realizes his/her/their own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his/her/their community.”² The WHO acknowledges that there is no universally accepted definition of well-being due to differing cultural perspectives and concepts. These concepts range from socioeconomic status and quality of personal relationships, to simply being happy.³ When a person’s well-being becomes compromised over a long period of time, mental health issues may arise. These conditions contribute to job burnout, decreased work productivity, as well as feelings of exhaustion and depletion.

Mental health and well-being are of special importance to Colleges and Schools of Pharmacy. Within Standards 14 and 15 of the Accreditation Council for Pharmacy Education (ACPE) Standards 2016, there is mention of health and wellness in regard to promoting wellness and healthy behaviors in the management of various disease states focused on patient care. The ACPE Standards also call for pharmacy programs to have appropriate resources to promote student success and well-being.⁴

In 2019, the American Association of Colleges of Pharmacy (AACP) collaborated with the American Pharmacists Association, Accreditation Council for Pharmacy Education, the National Association of Boards of Pharmacy, and the National Alliance of State Pharmacy Associations to provide recommendations for student pharmacist well-being. This consensus report underscored the importance of applying strategies that address self-care techniques for well-being and preventing burnout, rewards and incentives for engaging in well-being activities, and formal training to address behavioral health. These types of interventions are more valuable than ever due to the stress pharmacists and student pharmacists have experienced while serving communities during the COVID-19 pandemic.⁵

It is imperative to assess and understand the well-being of student pharmacists in order to best craft methods of outreach, support, and intervention. Such methods may help to prevent negative coping strategies in practice and provide

optimal levels of patient care and support. However, well-being is extremely difficult to quantify because well-being has a dynamic, evolving definition tied to many subjective factors. Multiple survey instruments have been developed in an attempt to appropriately assess well-being.⁶⁻⁹

The objective of this scoping review is two-fold, (1) to examine current assessments and measurements of student pharmacist well-being and (2) to evaluate interventions utilized to improve student pharmacist well-being, in order to determine the gaps and limitations in available literature.

METHODS

Following the Arksey and O'Malley framework,¹⁰⁻¹¹ this scoping review was undertaken to identify studies that assessed student pharmacists' well-being and any well-being-associated interventions employed in the pharmacy curriculum. This review was conducted in compliance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses extension for Scoping Reviews (PRISMA-ScR).

Three electronic databases (PubMed, ERIC, and EMBASE) were searched using a combination of keywords and Medical Subject Headings (MeSH). Due to the limited amount of literature available, initial search terms of "student pharmacist well-being" yielded insufficient evidence. The authors broadened the search to all health care professionals and higher education students to retrieve a sufficient number of articles for screening. In order to capture all the possible well-being literature on this novel topic, the authors did not set a time limit on the articles retrieved. Keywords included: "students, public health/psychology", "students, medical/psychology", "students, pharmacy/psychology", "burnout, psychological", "health", "health promotion", "wellness", "wellbeing", "well-being", and "well being". MeSH terms included "student/pharmacy", "health", and "health promotion". To further identify articles assessing student pharmacist well-being or targeted well-being interventions, the investigators also conducted a manual review of references of the included articles to identify relevant articles not found in the initial search for potential inclusion.

One hundred twenty-seven results were imported into the reference management software Zotero, (Vienna, Virginia). Screening was undertaken by four reviewers. Each member reviewed all imported articles, and the reference list of each included article was scanned to identify other potential articles. Studies were included if they pertained to assessments of well-being in student pharmacists or reported on curricular activities in pharmacy education that focused on well-being. Studies that involved interprofessional education were included if pharmacy was one of the disciplines evaluated. Study limits were set on English language. All study designs were eligible. Studies were excluded if they did not focus on student pharmacists' well-being. The assessment of well-being strategies described in each paper were tagged with appropriate keywords and were also categorized with subheadings of the well-being domains defined by the Centers for Disease Control and Prevention (CDC) (physical, economic, social, emotional, psychological, life satisfaction, and engaging activities).¹² The process of tagging studies to well-being categories was accomplished through prospective discussion among the reviewers about the studies' parameters. For example, studies that assessed students' perceptions of stress using the Perceived Stress Rating Scale were tagged to both the survey/questionnaire and stress/stress management categories, while an article describing how a well-being mindfulness activity was incorporated into the curriculum was tagged to the mindfulness/curriculum/intervention category.

RESULTS

The screening in the abstract phase excluded 36 results, leading to 91 results screened in full text for potential eligibility (Figure 1). Each of the included studies and were reviewed in detail by the research team. After detailed full-text review of the 91 articles, 15 (n=2062) were included in the results based on the set criteria and tagged accordingly (Table 1).

Of the 15 articles included in this review, seven of the studies (n=507) were conducted in the United States, and eight (n=1555) were conducted internationally. Six of the studies sought to assess student pharmacist well-being using various rating scales (n=1589). Four other studies incorporated a well-being intervention into the pharmacy curriculum (n=193), while the effects of mindfulness implementation were assessed in the remaining five studies (n=280). The initiative of student pharmacist well-being is a fairly new concept with all included studies except one being published after 2019.

Six studies were found that have assessed the well-being of student pharmacists (Table 2). Each study identified chose a different approach in assessing student pharmacist well-being. One study evaluated the quality of life (QOL) of 711 student pharmacists as a predictor of well-being by using a validated WHO-BREF instrument.¹³ The investigators found that 82.1% of the students had a fair overall QOL and poor well-being in all four domains. The RAND-36 is another widely used scale that measures QOL. One pharmacy school assessed 104 (53%) first- and third-year student pharmacists using the RAND-36, which assesses the domains of emotional well-being, physical pain, and emotional

functioning, and found a decline in well-being in third-year student pharmacists.¹⁴ Other schools of pharmacy have assessed psychological well-being in 447 (98.9%) student pharmacists as a composite of three survey instruments: Mood Rating Scale (MRS), Self Esteem Scale (SES), and Satisfaction with Life (SWL) scale. By using a composite result of these domains, the investigators drew conclusions regarding student pharmacists' psychological well-being and its positive relationship with burnout.¹⁵ Furthermore, a qualitative assessment of 49 (36.8%) first-year student pharmacists' well-being was conducted through thematic analysis of student pharmacists' reflections on personal well-being. Investigators conducted the analysis by coding the student pharmacists' reflections of their own well-being and developing unique factors of well-being based on their specific student population. Factors of well-being discovered through the thematic analysis included workload, learning environment culture and values, meaningful pharmacy school experiences, relationships, and personal factors.¹⁶ While the aforementioned studies assessed student pharmacist well-being at a single point in time, only one study was found that assessed student pharmacist well-being longitudinally. One investigator conducted a longitudinal assessment of 76 (100%) first-year student pharmacists with a survey instrument that defined well-being by the Gallup well-being domains and assessed the students for 29 weeks.¹⁷ The Gallup defined well-being domains include: career wellbeing, community wellbeing, financial wellbeing, physical wellbeing, and social wellbeing.¹⁸ By assessing student pharmacists' well-being over time, the investigators discovered that different domains of well-being can fluctuate throughout the course of a year.

Literature is now available that raises awareness regarding the existence of poor well-being in student pharmacists; to address this, colleges and schools of pharmacy have implemented different strategies to incorporate well-being activities into pharmacy curricula (Table 3). Some studies included semester-long interventions, while others incorporated a one-day activity. Certain schools included the well-being activities within a co-curricular experience, while others embedded the well-being initiatives within a required or elective course. There were nine studies that were included in this analysis that developed a targeted intervention to improve student pharmacist well-being. In Finland, one school of pharmacy incorporated a seven-week optional course that was structured in an Acceptance and Commitment Therapy (ACT) format. The ACT course format included introduction to the psychoeducational method, audio and visual experiential exercises, and participant reflections. The investigators found that 40 (86%) students' well-being and time management increased during the course.¹⁹ Another example of a longitudinal well-being activity was performed by the University of Kentucky, where four, month-long well-being activities were introduced in a required pharmacy course in which participation was optional for extra credit. These well-being activities were a single, month-long challenge that students incorporated into their daily routine and wrote reflections on at the end of each month to try and "nudge" long-term behavioral changes to improve well-being. The 126 (93%) students that completed the challenges reported the attempt to continue the healthy habits as they were identified as useful.²⁰ An alternate strategy is to incorporate a single well-being activity into a required course. The University of Waterloo incorporated a single "Check In" activity in a required course that consisted of a background reading, an in-person lecture component, and a faculty-student mentoring session.²¹ The investigators found that the 76 (63%) student pharmacists reported the "Check-in" activity as rewarding, and both students and faculty reported it as a positive experience. Finally, 49 (36%) first-year student pharmacists at one school of pharmacy wrote reflections on personal well-being in one of the required courses in the curriculum. These reflections were then used to find common themes, (availability and accessibility of institutional resources, personal time management and organizational strategies, personal mental health and physical health strategies, and activities that maintain social relationships) and a discussion and lecture on well-being then followed.²² All of the aforementioned strategies have their own unique benefits and limitations.

Of the nine studies that included a targeted intervention in the curriculum to improve student pharmacist well-being, five studies specifically focused on mindfulness and meditation. One technique that has been used to help nurture well-being is the practice of mindfulness and meditation. The strategy of mindfulness meditation has been used for decades to help reduce stress and promote overall well-being.²³ Some pharmacy schools have incorporated mindfulness activities to promote well-being in student pharmacists. One intervention incorporated the use of the mindfulness meditation app, HeadSpace, to help improve student pharmacist well-being. Ninety-two (70%) student pharmacists voluntarily practiced ten minutes of mindfulness meditation in the app every day for four weeks as an extracurricular activity. Results demonstrated enhanced mental well-being as well as decreased perceived stress.²⁴ Another university incorporated a voluntary, extracurricular, six-month yoga and meditation class to help improve student well-being through anxiety and stress reduction.²⁵ Seventeen students, including nine (53%) students from the school of pharmacy, experienced an improvement in their mindfulness and a decrease in their perceived stress score. Finally, a school of pharmacy in Ireland incorporated a voluntary, four-week mindfulness course into the pharmacy curriculum.²⁶ Fifty-one student pharmacists realized a significant decrease in stress and increase in mindfulness when compared to the 48 controls. This mindfulness course originated from ideas generated through thematic analysis of focus group member

contributions, in which student pharmacists vocalized interest in incorporating mindfulness as a coping skill for stress reduction.²⁷ The thematic analysis of feedback from 20 student pharmacists revealed five key elements: “so much to do with so little time, the role of lecturers, wanting to do well, learning by doing, and using mindfulness as a coping tool.” This mindfulness course consisted of a two-hour class session with group discussions followed by a 20-minute at home exercises each week. After incorporating the in-person mindfulness course, the pharmacy school also developed a four-week online delivery version of the same course with similar results. Fifty-two (37%) student pharmacists experienced a significant increase in professional efficacy and observation skills and a decrease in stress levels.²⁸

DISCUSSION

The concept of assessing and promoting wellness in other health care professionals, such as nursing and medical students, is not new. There have also been numerous publications assessing and highlighting mental health challenges experienced by student pharmacists including stress, anxiety, depression, and burnout; however, literature focused specifically on well-being is limited.²⁹⁻³⁰ Although the authors have found publications on how to assess the well-being of student pharmacists, each publication used a different assessment tool. This may be due to the multifactorial nature of well-being and the fact that there is no universally accepted definition.

Since the promotion of well-being is multi-faceted, the approach can be varied and individualized to meet the unique needs of the individuals involved. Our results yielded diverse interventional approaches to help promote well-being in schools of pharmacy. Additionally, since well-being is subjective to the individual, it raises the question of how to best incorporate well-being initiatives that meet the needs of a diverse student body. One approach is to incorporate unique well-being activities into the required curriculum or co-curriculum. Most schools of pharmacy already require a seminar class or professional development course as part of their curriculum, which may serve as a useful location for such programming. Other approaches include making targeted well-being experiences an elective or optional activity in which students can voluntarily participate. Out of the targeted interventions reviewed, all yielded positive feedback from the students who participated.

Initiatives involving student well-being seem to have gained traction in 2017-18 with the charge to the AACP Student Affairs Standing Committee to develop a resource guide for its members on how to implement well-being strategies for student pharmacists. The report recommended discussions and programming on the topic of well-being, the creation of a well-being task force, and the curricular integration of well-being.³¹ In 2018-19, the AACP Academic Affairs Standing Committee was charged with assessing and promoting student pharmacist well-being.³² The 2018-19 Academic Affairs Report recommended that AACP should consider developing programs that can evaluate student pharmacist well-being and identify factors affecting well-being.³² The standing committee's reports have led to the development of policies for schools of pharmacy that may influence future well-being initiatives.³³ In 2018, AACP hosted a Fall Institute on strategies to promote a culture of well-being among students and faculty. The committee's charge for 2022 is to develop a resource guide for member institutions to help with implementing holistic well-being strategies for all students, faculty, and staff.³⁴ The newly created AACP Well-being and Resiliency Community is also developing a Well-being Toolkit for its member institutions.³⁵

The American Pharmacist Association (APhA) published its recommendations from its National Consensus Conference, including that schools should offer ongoing education and training on student pharmacist well-being and that ACPE Standards require annual well-being assessments for student pharmacists to guide organizational initiatives.⁵ In response to this, the draft of Standards 2025 address student pharmacist well-being in Standards 14 and 15. These draft Standards emphasize the importance of developing organizational resources and services to support well-being as well as specific policies to promote a well-being friendly environment.³⁶ Once finalized, these future accreditation standards will likely include more defined key elements associated with student pharmacist well-being. In the meantime, schools of pharmacy can utilize the aforementioned AACP Policies on Professional Education as guidance.³³

The promotion of well-being is needed now more than ever, especially for student pharmacists. With the inclusion of well-being recommendations in the draft of Standards 2025, it is crucial now for all major organizations/associations to collaborate on well-being initiatives for standardization. After reviewing the literature, it would be helpful for colleges of pharmacy to share a standard definition of student pharmacist well-being that is incorporated into its governing documents. Future researchers could develop a standardized and validated instrument to assess well-being, specifically geared toward student pharmacists. If a standard definition and assessment can be determined, this would lead to possible secondary meta-analysis to measure impactful interventions and their associated outcomes. One limitation to standardization is how the interpretation of individual well-being is contingent on subjective experiences and diverse backgrounds.

Experts have also proposed possible approaches to nurturing well-being in student pharmacists. One expert stated, “Well-being initiatives in a college of pharmacy should focus on decreasing student perceived stress and increasing perceptions of satisfaction and fulfillment.”³⁷ Student pharmacist well-being initiatives can come from interested individuals, dedicated faculty, and student organizations from the schools of pharmacy. One thematic analysis of first-year student pharmacists yielded four individual approaches on how to cope with stress and well-being. The four main areas that individual students identified to help promote well-being were: personal health, time management, socialization, and the use of institutional resources.²² The investigators found that student pharmacists who were more involved in co-curricular activities studied more, had higher GPAs, and had stronger relationships with faculty, staff, and peers.¹⁶ Religion and spirituality of student pharmacists also positively affected their emotional and mental well-being, which are also important for student success.³⁸ Another recommendation was for the establishment of faculty and staff cohorts that assist and support students with low resilience and well-being. Student organizations can also develop events to promote resilience and well-being supplemental to the curricular teachings. These events could include healthy meal offerings, organized exercise activities, outside speakers, social events, and community service.³⁹ Identifying and recruiting students, faculty, and staff members to lead these initiatives provides diverse perspectives on well-being and decreases the burden on individual students.⁴⁰

It is imperative for schools of pharmacy to identify opportunities for targeted interventions tailored specifically to the needs of its own students, rather than adopting a universal intervention. It is unlikely that a universally accepted well-being intervention will be practically relevant for all students. Common themes that arose from this review are a need to address the availability of organizational resources, personal self-help strategies, and the incorporation of mindfulness within the curriculum. These themes could help guide schools of pharmacy when crafting institution-specific well-being interventions. One example of meeting this organizational resource need is for schools to incorporate a certified Mental Health First Aid (MHFA) training course for its students. This MHFA training program has been shown to help mitigate the stigma of mental health struggles and nurture a well-being culture within a school of pharmacy.⁴¹ APhA has also partnered with the Mayo Clinic for students to use the My Well-being Index Assessment app which allows individuals to track their well-being and plots progress over time. Not only does it keep a record of one’s progress, but it also shows how one’s well-being compares to the average well-being scores across all pharmacists. Additionally, the app provides tailored resources to meet identified well-being needs.⁴² This app is an example of how to support students with self-help strategies.

Well-being and COVID-19

The COVID19 pandemic has taken a toll on student pharmacists’ purpose well-being, social well-being, financial well-being, physical well-being, and community well-being at our schools of pharmacy, as outlined by Gallup.⁴³ With new virtual and remote learning environments, students may have increased anxiety about completing their coursework efficiently. The ever-changing landscape of pharmacy education amid COVID-19 led to a delay in research opportunities as well as missed professional meetings and ceremonies. There has also been anxiety regarding how students would conduct their experiential rotations and take licensing examinations. Schools of pharmacy may need to assist students with potential well-being challenges arising from the COVID-19 pandemic. Such assistance can include helping students focus on what they can control like maintaining a regular schedule and promoting emotional well-being by doing something they enjoy each day.⁴⁴

CONCLUSION

The promotion of student pharmacist well-being is a multifaceted initiative. There are several ways to assess well-being and provide impactful interventions based on perceived needs and the culture of the student body. Student pharmacists are the future of the pharmacy profession and schools of pharmacy must nurture students’ well-being not only in terms of academic performance, but also emotional health. Incorporation of a “well-being curriculum” is critical for student success following the COVID-19 pandemic. Pharmacy faculty are well positioned to talk to students and advise them that well-being challenges may arise during their time spent in pharmacy school. During these conversations, caring, openness, and understanding are of utmost importance.

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Figure 1. Flow Chart of Study Selection According to PRISMA-ScR Guidelines

Table 1. Descriptions of Literature Pertaining to Student Pharmacist Well-being

Citation and Tags	Objective	Population
Well-being Assessment		
Okoro, 2019 QOL of pharmacy students in Northern Nigeria Tags: Pharmacy Student Well-being Survey and Questionnaire Self-assessment Quality of Life	To assess the QOL of Nigerian pharmacy students To investigate QOL predictors	Student pharmacists from three schools in Nigeria (n=711)
Edgell, 1995 Well-Being and Functional Status of Pharmacy Students: A Preliminary Assessment Tags: Pharmacy student Well-being Survey and Questionnaire Self-reported	To investigate how pharmacy education affects the health status of student pharmacists	First- or third-year student pharmacists at the University of Arizona College of Pharmacy (n=196)
Cho and Jeon, 2019 The role of empathy and psychological need satisfaction in pharmacy students' burnout and well-being Tags: Pharmacy student Burnout Empathy Well-being Survey and Questionnaire Self-Assessment	To examine the relationship between student pharmacists' empathy and psychological need satisfaction, levels of burnout, and psychological well-being	Student pharmacists from five South Korean universities (n=452)
Babal and Abraham, 2020 Student Pharmacist Perspectives of Factors that Influence Wellbeing during Pharmacy School Tags: Pharmacy Student Well-being Stress Curriculum Student reflection Thematic Analysis	To explore first-year student pharmacist perspectives on the influence of individual, educational system, and healthcare system factors on their well-being	First-year student pharmacists at University of Wisconsin during required course who consented to participate during the study period February-June 2019 (n=49)
Hagemeier, 2020 A Longitudinal Analysis of First Professional Year Pharmacy Student Well-being Tags: Pharmacy student Well-being	To assess and characterize student pharmacist well-being across the first professional year To determine the relationship between the number of exams taken, GPA, and well-being scores	First-year student pharmacists at East Tennessee State University (n=76)

<p>Survey and questionnaire Self-assessment Cantril self-anchoring scale Gallup well-being domains Opoku-Acheampong, 2017 Perceived stress and QOL of pharmacy students in University of Ghana</p> <p>Tags: Pharmacy student Well-being Survey and Questionnaire Self-reported Quality of Life</p> <p>Required Curricular Well-being Interventions Asikainen, 2019 Understanding and promoting students' well-being and performance in university studies</p> <p>Tags: Pharmacy student Well-being Stress Curriculum Student Reflection Survey and questionnaire</p> <p>Cain, 2020 Effectiveness of Issuing Well-being Challenges to Nudge Pharmacy Students to Adopt Well-being Protective Behaviors</p> <p>Tags: Pharmacy student Well-being Curriculum Survey and questionnaire</p> <p>Fernandes, 2020 Check-In: An Educational Activity to Address Well-Being and Burnout among Pharmacy Students</p> <p>Tags: Pharmacy Student Well-being Curriculum Student reflection</p> <p>Abraham, 2020 Strategies first year doctor of pharmacy students use to promote well-being</p>	<p>To assess the relationship between stress and QOL of student pharmacists</p> <p>To examine student pharmacists' experiences of a small ACT-based intervention that was implemented as a 7-week course with weekly online modules</p> <p>To assess the effectiveness of well-being challenges in a pharmacy management course To influence student adoption of positive well-being behaviors</p> <p>To develop an active-learning activity, called "Check-In," to teach and reflect on healthcare provider burnout</p> <p>To assess strategies that first-year student pharmacists utilize to manage stress and promote well-being throughout the program</p>	<p>Student pharmacists at University of Ghana (n=110)</p> <p>Student pharmacists from University of Helsinki Finland (n=40)</p> <p>Third-year student pharmacists at University of Kentucky (n=136)</p> <p>Student pharmacists from University of Waterloo School of Pharmacy (n=120)</p> <p>First-year student pharmacists from University of Wisconsin (n=49)</p>
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Tags:

Pharmacy student
Well-being
Curriculum
Student reflection
Thematic analysis

Mindfulness Co-curricular Well-being Interventions

Zollars, 2019

Effects of mindfulness meditation on mindfulness, mental well-being, and perceived stress

To investigate the effects of mindfulness meditation using the Headspace™ app on mindfulness, mental well-being, and perceived stress in student pharmacists

First- through third-year student pharmacists at Southern Illinois School of Pharmacy (n=92)

Tags:

Pharmacy student
Well-being
Mindfulness
Survey and questionnaire
Self-assessment
Headspace
Perceived stress

Lemay, 2019

Impact of a Yoga and Meditation Intervention on Students' Stress and Anxiety Levels

To evaluate the impact of a six-week yoga and meditation intervention on college students' stress perception, anxiety levels, and mindfulness skills

Students from University of Rhode Island, including student pharmacists (n=20)

Tags:

Pharmacy student
Well-being
Stress management
Mindfulness
Survey and questionnaire
Self-assessment
Yoga

Mindfulness Elective Curricular Well-being Interventions

O'Driscoll, 2019

A Thematic Analysis of Pharmacy Students' Experiences of the Undergraduate Pharmacy Degree in Ireland and the Role of Mindfulness

To determine student pharmacists' experiences of stress as a part of the current pharmacy degree
To explore the potential of incorporating the principles of mindfulness into the curriculum

Student pharmacists in all years from five schools in Ireland (undergraduate degree) (n=20)

Tags:

Pharmacy student
Well-being
Focus Groups
Stress management
Thematic analysis
Mindfulness

O'Driscoll 2019

To assess the quantitative effects of a mindfulness-based intervention on student

Student pharmacists from one school of pharmacy in Ireland (n=99)

Impact of a mindfulness-based intervention on undergraduate pharmacy students' stress and distress: Quantitative results of a mixed-methods study	pharmacist stress, distress, burnout, and mindfulness levels	
Tags: Pharmacy student Well-being Mindfulness Curriculum Survey and questionnaire Self-assessment		
O'Driscoll, 2019 An online mindfulness-based intervention for undergraduate pharmacy students: Results of a mixed-methods feasibility study	To assess the feasibility and acceptability of an online mindfulness-based intervention To determine its effect on student pharmacist well-being	Student pharmacists from four schools in Ireland (undergraduate degree) (n=139)
Tags: Pharmacy student Well-being Survey Questionnaire Mindfulness Curriculum Stress management Self-assessment		

Abbreviations: ACT= Acceptance and Commment Therapy; GPA= Grade Point Average; QOL= Quality of life

Table 2. Results of Literature Assessing Student Pharmacist Well-being

Citation	Design/Tools	Results ^a	Comments
Okoro, 2019 QOL of pharmacy students in Northern Nigeria	Cross-sectional descriptive study WHOQOL-BREF questionnaire Multiple linear regression analysis identified predictors of QOL	Response rate was 81.2% QOL mean score out of 100 was 76.94 (17.65) Being Christian, 5th year student, and having a current illness/problem negatively affected overall QOL (p<.05) Schooling in the state of residence, active involvement with student organizations/clubs, and having a current illness/problem negatively affected the environment domain (p<.05)	Students had a fair overall QOL and poor well-being in all four domains Religion, state of residence, year of study, organizations/clubs and current illness/problem were the significant predictors of QOL Limitations: cross-sectional design instead of longitudinal cohort to assess well-being at

Edgell, 1995 Well-Being and Functional Status of Pharmacy Students: A Preliminary Assessment	Well-being was assessed using the RAND 36-Item Health Survey	Response rate was 84% No significant mean score differences were found between the classes, and the mean scores for the first-year class remained stable during the semester ($p=.53$) The third-year class's mean scores for the emotional well-being and emotional problem-related role functioning scales decreased significantly during the semester ($\Delta 7.3$, $p=.04$)	an individual level may have resulted in recall bias related to historical information Pharmacy school may affect students' functioning and well-being in different and unique ways Limitations: small sample size and students did not have to participate in both surveys
Cho and Jeon, 2019 The role of empathy and psychological need satisfaction in pharmacy students' burnout and well-being	Students were surveyed with several scales and results used structural equation modeling The Jefferson Scale of Empathy (Health Professions Students version) assessed empathy The Activity-Feeling States Scale assessed psychological need satisfaction The Maslach Burnout Inventory Student Survey assessed burnout Mood Rating Scale, Self-Esteem Scale, and Satisfaction with Life Scale assessed psychological well-being	Response rate was 98.9% ($n=447$) Empathy was positively associated with psychological well-being ($\beta = 0.18$) Perceived satisfaction of psychological needs was positively related to psychological well-being ($\beta = 0.59$) Perceived satisfaction or psychological needs was strongly and negatively related to burnout ($\beta = -0.71$)	This study assessed well-being from a mood rating scale, self-esteem scale, and satisfaction with life scale Education systems should consider students' empathy and psychological needs for student success and well-being Limitations: results used mean scores instead of individual items and were correlations thus not allowing for determination of a causal relationship
Babal and Abraham, 2020 Student Pharmacist Perspectives of Factors that Influence Wellbeing during Pharmacy School	Student pharmacists were required to submit reflective essays detailing the factors that most significantly contributed to their well-being Qualitative thematic analysis was performed using open and axial coding, hierarchical categorization, and representative theme determination	36.8% ($n=49$) students submitted reflective essays for analysis Five themes identified for pharmacy student well-being: (a) workload; (b) learning environment culture and values; (c) meaningful pharmacy school experiences; (d) relationships; and (e) personal factors. Student pharmacists did not consistently identify healthcare system factors as influencing well-being	This study assessed well-being through thematic analysis Student pharmacists identified both education system and individual factors that influenced well-being Limitations: small sample size of only first-year students at a single institution
Hagemeier, 2020 A Longitudinal Analysis of First Professional Year Pharmacy Student Well-being	Students answered 6 questions (Likert scale 1-7) during each two-hour weekly class session (29 weeks) Questions based on Gallup-defined well-being domains: (a) career well-being, (b) community well-being, (c) financial well-being, (d) physical well-being, and (e) social well-being	100% ($n=76$) students completed the study All domains decreased by the end of fall semester (career mean= 5.5 vs 4.8, $p>.001$; community mean= 5.4 vs 4.5, $p<.001$; financial mean= 4.7 vs 3.9, $p=.001$; physical mean= 5.0 vs 4.1, $p<.001$; social mean= 5.5 vs 5.0, $p=.016$; overall mean= 5.3 vs 4.8, $p=.003$). Social well-being increased after winter break (mean= 4.5 vs 4.8, $p=.018$).	This study assessed well-being with a Likert scale from Gallup-defined well-being domains Demonstrated well-being fluctuates throughout the semester

	Score of 1-2 equaled suffering, 3-4 equaled struggling and 5-7 equaled striving	Physical well-being was the largest predictor of overall well-being in the fall Social/career well-being was the largest predictor for overall well-being in the spring Overall well-being was positively affected by number of exams ($r = .56, p < .05$) 71.4% (n=110) students completed the study The mean stress scores were higher at Time 2 compared to Time 1 No significant difference in stress for different year group ($p = .44$) Female students had higher stress scores compared to male students (19.6 vs. 17.4) The main stressors identified were: large volume of material to be studied, laboratory report writing, constant pressure to maintain good grades, and lack of leisure time	Limitations: small sample size of only first-year students at a single institution
Opoku-Acheampong, 2017 Perceived stress and QOL of pharmacy students in University of Ghana	The 10-item PSS and the WHOQOL scale were administered to the same participants at two time points: Time 1 (4 weeks into the semester) and Time 2 (8 weeks afterwards)		The study reported relationships between stress and various domains of QOL Limitations: only one school of pharmacy was surveyed and study did not account for non-response bias

^a p-values are reported if available in the study
Abbreviations: PSS = Perceived Stress Scale; QOL= Quality of life; WHOQOL-BREF= World Health Organization Quality of Life Instrument

Table 3. Results of Literature Evaluating the Impact of Well-being Interventions Involving Student Pharmacists

Citation	Design/Tools	Results ^a	Comments
Asikainen, 2019 Understanding and promoting students' well-being and performance in university studies	Students' well-being, experiences of stress, organized studying, and psychological flexibility were measured with questionnaires at the beginning and end of a course Students' experiences of how the course affected studying were analyzed from open-ended responses and reflective journal	45.7% (n=21) consented to analysis Students' well-being and time management increased during the course ($\Delta 4.66, p = .001$) Students experienced that the course affected their studying	This study demonstrated that online course interventions can foster students' well-being and study skills More research is needed to identify the long-lasting effects Limitations: small sample size and potential reporting bias
Cain, 2020 Effectiveness of Issuing Well-being Challenges to Nudge Pharmacy Students to Adopt Well-being Protective Behaviors	Well-being activities were implemented into a required course with an extra credit point for each completion (0.2%) Focused on four challenges: cellphone use, feelings of gratitude, sleep, and exercise Post-activity survey captured completion, intention to continue, and purpose for doing said activity	93% (n=126) student pharmacists completed at least one activity and 21% (n=28) all four activities Main reason for completion was for extra credit followed by promoting well-being 46%-66% of participants stated intent to continue the well-being habits	This promotes a strategy to include optional well-being assignments in a required course "Low cost" assignments led to a shift in positive well-being behaviors Limitations: the success of long-term adoption was based on self-reported data

Fernandes, 2020 Check-In: An Educational Activity to Address Well-Being and Burnout among Pharmacy Students	Check-In course was comprised of a 20-minute online lecture on healthcare provider burnout, two pre-readings on burnout among physicians, and an optional one-on-one session between individual students and faculty or staff member Students rated their current mental health on a 10-point scale from reflection guide and reflected on questions focusing on energy expenditure, self-care, and self-compassion within the past, present, and future	63% (n=76) student pharmacists participated in the activity Check-In was reported as rewarding and overall positive for students and faculty The personal connection with members from the school and the placement of the activity within the curriculum contributed to the success of the activity	Limitations: short duration of individual sessions and feedback was self-reported
Abraham, 2020 Strategies first year doctor of pharmacy students use to promote well-being	Students were enrolled in the second semester of their first year of a four-year PharmD program Students were required to write a two-page reflection before a small group discussion and lecture on their overall well-being while in a social and administrative sciences course Open and axial coding was conducted on the reflections using qualitative thematic analysis	36.8% (n=49) student pharmacists reported multiple strategies to help cope with stressors and improve their well-being Four themes emerged, including: (1) availability and accessibility of institutional resources, (2) personal time management and organizational strategies, (3) personal mental and physical health strategies, and (4) activities that maintain social relationships	P1 students are actively thinking about and participating in well-being activities Colleges and schools of pharmacy need to understand well-being strategies students use and identify approaches for supporting student needs Limitations: single school of pharmacy included and low participation rate
Zollars, 2019 Effects of mindfulness meditation on mindfulness, mental well-being, and perceived stress	Medication using the Headspace™ app for at least 10 minutes per day for four weeks Students at baseline completed the HPLP Data was collected from the pre/post surveys using the FFMQ, WEMWBS, and Cohen PSS	70% (n=92) student pharmacists completed the study Data revealed the intervention was associated with enhanced mindfulness and mental well-being and decreased perceived stress (p<.001) Further analysis indicated that controlling for various health promoting lifestyle behaviors preserves the positive impact of mindfulness meditation as demonstrated	Mindfulness meditation improved the participants overall mental health The data support that pharmacy schools adopt these practices in their curriculum Limitations: students volunteered instead of being selected and potential incentive bias
Lemay, 2019 Impact of a Yoga and Meditation Intervention on Students' Stress and Anxiety Levels	Six-week pilot program of a 60-minute vinyasa flow yoga class once weekly, followed by guided meditation by trained faculty members Students completed pre- and post-intervention questionnaires to evaluate changes in: stress levels, anxiety levels, and mindfulness skills The questionnaires consisted of: the BAI, the PSS, and the FFMQ	85% participants completed the study (n=17) Nine of the students were enrolled in the Doctor of Pharmacy program and eight were enrolled in other academic programs Students' anxiety and stress scores decreased significantly while their total mindfulness increased significantly (BAI scores Median= -9, p<.001; PSS scores Median= -8, p<.001; FFMQ scores, Median= 4.0, p<.001) Changes in categorical data from pre- to post-intervention on the BAI and PSS were significant,	Results suggest adopting a mindfulness practice may reduce stress and anxiety in student pharmacists Limitations: small sample size, short duration, and self-reported outcomes

O'Driscoll, 2019 A Thematic Analysis of Pharmacy Students' Experiences of the Undergraduate Pharmacy Degree in Ireland and the Role of Mindfulness	Focus groups and transcripts were coded using Braun and Clarke method to find themes	with no students scoring in the "high" category for stress or anxiety on the post-intervention questionnaire 20 student pharmacists (no response rate provided) from all classes at three of the five schools were represented Themes found: "so much to do; so little time," "role and availability of lecturer," "fear of failure," "learning by doing," and "mindfulness and coping tool" Students were not aware of the support currently provided by the schools and welcomed the idea of a mindfulness course and stress prevention	This study precipitated the incorporation of a mindfulness course in the curriculum Limitations: not all pharmacy schools in Ireland were represented in the study population
O'Driscoll 2019 Impact of a mindfulness-based intervention on undergraduate pharmacy students' stress and distress: Quantitative results of a mixed-methods study	A 4-week MBSR course consisting of a two hours lecture plus 20 minutes of practice built into the curriculum Stress was measured by PSS, Mental distress by GHQ, Empathy by JSPE, Burnout by MBI-SS, and Mindfulness by FFMQ	39.9% (n=99) student pharmacist responses were analyzed Results showed student pharmacist improvement in all scales, but only the GHQ was statistically significant ($F=15.3$, $p<.005$) Course evaluations were all positive that students felt they experienced benefit	Small sample size and not meeting power could have led to less-than-optimal results Limitations: potential self-selection bias
O'Driscoll, 2019 An online mindfulness-based intervention for undergraduate pharmacy students: Results of a mixed-methods feasibility study.	Adapted online mindfulness-based 4-week course with one-hour online classes and 20 minutes of daily practice Optional non-graded course Stress was measured by PSS, Mental distress by GHQ, Empathy by JSPE, and mindfulness by FFMQ	37% (n=52) student pharmacists completed the course Results showed improvement in PSS, GHQ, JSPE, FFMQ, but not statistically significant Qualitative analysis revealed that students found the most benefit in stress reduction	Follow up intervention study from focus group Limitations: 62% dropout rate and small sample size which did not meet power lead to insignificant results

^a p-values are reported if available in the study

Abbreviations: ACT= Acceptance and Commient Therapy; BAI= Beck Anxiety Inventory; FFMQ= Five facet mindfulness questionnaire; GHQ= General health Questionnaire; GPA= Grade Point Average; HPLP= Health Promoting Lifestyle Profile; JSPE= Jefferson Scale of Physician Empathy; MBI-SS= Maslach Burnout Inventory – Student Survey; MBSR= Mindfulness-Based Stress Reduction; PSS = Perceived Stress Scale; QoL= Quality of life; WEMWBS= Warwick Edinburgh Mental Well-Being Scale; WHO= World Health Organization; WHOQOL-BREF= World Health Organization Quality of Life Instrument