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# A holistic approach to sustain and support lifelong practices of wellness among healthcare professionals: generating preliminary solid steps towards a culture of wellness

Beverley Argus-Calvo<sup>1</sup> , Deborah J. Clegg<sup>2</sup> , Maureen D. Francis<sup>3</sup> , Alok Kumar Dwivedi<sup>4</sup> , Paul A. Carrola<sup>5</sup>  and Marie Leiner<sup>6\*</sup> 

## Abstract

**Background** The COVID-19 pandemic has served as a catalyst for recognizing the challenging environments in which healthcare workers operate, underscoring the urgent need to enhance their wellness to better support themselves and others. The implementation of a culture of wellness within the context of healthcare education, with a particular emphasis on individual-level strategies, allows for the realization of its intrinsic value and significance as a foundation for broader organizational strategies. This approach facilitates the establishment of a sustainable culture of wellness that benefits both current and subsequent generations of healthcare professionals.

**Methods** We implemented our wellness program using a pragmatic pre-post study design for different settings. Our wellness intervention program was tested in three ways by creating combinations of different intensities (high, moderate, or low), delivery methods (face-to-face vs. virtual), different motivations (incentive, mandatory, or volunteer participation), and different timings (during medical programs or before entering into healthcare programs) among medical and nursing students. The effects of the wellness program were measured on quality of life, emotional intelligence, and efficacy scores among healthcare students. Statistical methods included repeated measures analysis of variance and paired t-tests.

**Results** A total of 224 students (13 in high, 145 in moderate, and 66 in low-dose interventions) participated in our study program. Most scores were significantly improved except for a few factors in the high-dose face-to-face Well-Teach intervention cohort. Among quality of life components, the average psychological scores were markedly increased after high (13.2 vs. 14.7,  $p = .018$ ), moderate (13.9 vs. 14.8,  $p < .001$ ), and low (12.8 vs. 13.4,  $p < .001$ ) intensity intervention cohorts. The moderate and low intensity of wellness intervention cohorts had the highest impact on the total emotional intelligence scores (mean difference = 3.021, 95%CI:0.553–5.488,  $p = .008$ ) and (mean

\*Correspondence:  
Marie Leiner  
marie.leiner@ttuhsc.edu

Full list of author information is available at the end of the article



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difference = 5.197, 95%CI:3.057–7.337,  $p = < 0.001$ ), respectively. The low-dose healthcare intervention program yielded improvements in all components of all scores to a greater extent than moderate-dose or high-dose with face-to-face intervention programs.

**Conclusions** This study demonstrates that our multifaceted Well-Teach model can be used to improve the quality of life, emotional intelligence, and self-efficacy of healthcare students. Low- or moderate-intensity intervention programs integrated into the curriculum may be more practical in health sciences education to sustain and promote lifelong wellness practices as solid steps toward attaining a “culture of wellness”. Our model should be considered to be beneficial, sustainable, cost-effective, comprehensive, and effective for current and future generations of healthcare providers.

**Keywords** Wellness programs, Healthcare education, Burnout prevention, Indivisible Self model, Healthcare education curriculum, Wellness culture

## Background

The COVID-19 pandemic exacerbated the already existing burnout, stress, and anxiety epidemic among healthcare workers [1–4]. These professionals operate in emotionally demanding environments, which significantly impact their well-being, emphasizing the crucial need for dedicated support and care to maintain their overall wellness.

### The importance of wellness in healthcare education

From their formative years, health professions students face a competitive environment facing higher risks of insecurity, depression, alcohol abuse, anxiety, and suicide compared to the general population [5]. Burnout is the most prevalent of the psychosocial problems faced by healthcare professionals. It is a three-dimensional construct resulting from chronic stress [6–11]. Burnout is common among students in health professions like medicine, nursing and dental and dental hygiene [12–15] and remains prevalent among pharmacists, medical residents, nurses, and physicians [16–19]. About 50% of medical students experience burnout before residency [20]. Although burnout isn't a mental illness, 90% of people with burnout test positive for depression [21]. Burnout affects professional performance and quality of care, and is associated with absenteeism and disability [22, 23]. Given the close relationship between burnout and depression, it is therefore not surprising that physicians with a positive diagnosis of depression also have a higher rate of medical error and deteriorated personal health [24]. Although the deficiency in wellness among healthcare professionals is recognized as a potential contributor to their health issues, the academic field currently lacks evidence-based defined pathways, assessment methodologies, and empirical data to substantiate the benefits of achieving wellness.

Different attempts to educate healthcare providers on the concept of wellness have been developed using a variety of activities, policies, and approaches [25–29]. A substantial portion of these strategies focused on

elucidating the reasoning behind the vital role of wellness for healthcare professionals. Despite the failure of numerous attempts to provide conclusive or comprehensive results, the analysis of implementation strategies alongside our experiences led us to identify the root cause, which we have defined as a lack of a solid wellness culture among students and professionals at all levels, as well as the corresponding integration and support of their organizations.

### The importance and relevance of fostering a culture of wellness

Establishing a culture of wellness in healthcare institutions supports employee well-being, improves patient outcomes, enhances quality of care, and contributes to the sustainability of the healthcare system requires an individualized and institutional approach [30]. This multifaceted approach is best when influenced by internal factors such as individual member characteristics, beliefs, and behaviors, as well as external elements including the environment, social structures, cultural norms, policies, and regulations [31]. The unwavering dedication, support, active involvement, and leadership displayed by individuals at all tiers of healthcare establishments are key to ensuring the longevity, flexibility, and progression of such programs [32]. This commitment of healthcare providers is evidenced through the assistance and endorsement provided for example by the National Academy of Medicine Action Collaborative on Clinician Well-Being and Resilience. This support encompasses the integration of mentoring programs, leadership development, training, and collaborative initiatives [33].

### Challenges in developing a culture of wellness

The importance and visibility of wellness programs in the healthcare sector are clearly apparent. However, this acknowledgment alone does not guarantee the necessary backing and sustainability. To achieve enduring support, a pivotal shift is essential, transitioning the focus

from the “why” of wellness importance to the “how” of its implementation, evaluation, and recognition.

Recognizing the importance of a wellness culture is a critical first step for any organization. Establishing and valuing a wellness-centered culture can be difficult, especially when the current leadership lacks familiarity with the necessary methods to nurture, embrace, and champion such a culture. This critical aspect was absent from their training or professional background, potentially setting the stage for the continuation of this pattern among upcoming students. Additionally, a discrepancy is evident in the alignment of individual and system-level interventions and the resources allocated. Furthermore, inconsistencies have been identified concerning wellness programs, the challenges in evaluating subjective outcomes, standardization, the integration of academic performance measures, and the issue of stigmatization [34].

At the individual level among healthcare students, support and engagement are typically constrained by two primary factors: time limitations required to balance academic demands with involvement in wellness initiatives, and the lack of a generalizable value associated with wellness concepts. Consequently, it is challenging to obtain evidence-based information from studies that employ non-randomized control designs or longitudinal methodologies, obtain larger sample sizes, or generalize findings across multiple studies. Moreover, students demonstrate diverse preferences, levels of knowledge, and resistance to wellness programs, resulting in challenges related to engagement, participation, and program delivery. The potential for selection bias exists, prompting questions about whether voluntary workshop participants have greater needs than non-attendees. Additionally, safety and ethical considerations need to be considered in regard to all aspects of program preparation encompassing both individual and organizational levels.

#### **Promoting sustainable wellness practices among healthcare students**

Holistic approaches to wellness deserve consideration in alignment with the shift towards exploring the implementation of wellness. A holistic approach to wellness refers to a comprehensive and integrated method that considers various aspects of an individual's well-being. Overpasses both the concepts of health and wellness that might be hindering the efforts to develop strategies for effective solutions [35]. Health cannot be compartmentalized or isolated but instead needs to be conceived with a holistic approach into a model composed of elements of physical, behavioral, psychological, social and spiritual well-being [36]. Considering this approach allows to understand health achievable even by those that suffer illnesses, chronic diseases, or disabilities [37–39].

Wellness initiatives and programs are referenced in various sectors of health education with the rationale that they are implemented based on the understanding that self-care is a critical aspect of effectively navigating the challenges associated with academic and professional pursuits.

Certain wellness programs in educational settings which adopt a holistic approach, encompass mind-body techniques, stress management, self-care, and mindfulness practices for medical students [40]. Programs also involve mindfulness-based interventions for preclinical medical students [41] and utilize Compassion Cultivation Training to enhance medical student wellness and improve clinical care [42]. Furthermore, there are shortened mindfulness interventions designed to improve wellness in first-year medical students [43], programs that concentrate on exercise interventions to enhance health and well-being among medical students [44], and interventions that specifically target fitness to boost exercise levels and well-being in medical students [45]. Several programs suggest curriculum changes while promoting a holistic strategy. For instance, they aim to develop a culture of wellness among medical students and faculty to address burnout in the medical profession [46]. One well-known program is the Vanderbilt Medical Student (VMS) Wellness Program [47]. The program features a structured wellness curriculum with three primary domains: the Faculty Advisory College System, the Student Wellness Committee, and the VMS Live curriculum. These components integrate student, faculty, and curriculum modifications to establish a holistic approach to wellness. The curriculum modifications detailed in the research highlight the effectiveness of integrating student input, allowing students to actively guide and contribute to the development of their wellness curriculum. These changes also involve organizational adjustments aimed at fostering a supportive learning environment with increased flexibility to accommodate individual needs while maintaining educational standards [48–50].

These strategies all highlighted comparable challenges at both individual and organizational levels as mentioned previously. To instigate organizational transformations that foster a wellness culture in healthcare education, focusing on individual-level interventions is essential as the initial step. Hence, interventions should span the healthcare spectrum, commencing with students who represent the upcoming healthcare workforce. Integrating this strategy aims to develop sustainable, cost-effective, comprehensive and effective programs that promote, sustain and advance wellness [28, 51–53]. Emphasizing wellness can empower healthcare individuals to take a proactive approach in advocating for organizational changes or working towards improvements within the workplace. Those who prioritize their well-being tend to

possess enhanced self-awareness, resilience, and motivation to address issues affecting health and well-being. This proactive approach has the potential to drive initiatives that improve workplace culture, bolster mental health support, enhance work-life balance, and establish a positive and enduring work environment for all. Prioritizing individual changes before implementing broader organizational strategies is crucial for fostering a lasting culture of wellness in healthcare education [54–58]. Furthermore, organizational changes to promote wellness will necessitate a transformation in the existing culture to acknowledge that wellness is not merely a nice-to-have skill, but a crucial asset. The transition involves recognizing that the journey towards holistic wellness in healthcare students is continuous and should ideally begin early, potentially through adjustments in the curriculum. This process also necessitates ongoing support and adaptations to prepare students for anticipated and unforeseen challenges in the future. Lastly in approaching wellness as a holistic model, a comprehensive approach is essential, so any wellness effort that focuses on one or a few activities (e.g., installing a gym, teaching mindfulness, or hosting conferences on wellness philosophy) does not necessarily constitute a holistic wellness program.

Reflecting on these foundational principles and advancing from our previous models, we unveiled a holistic wellness initiative known as “Well-Teach” Teaching Wellness. The program, supported by cognitive and emotional competencies, was evaluated at the individual level, using diverse modes, doses, and settings of intervention with the objective of enhancing the quality of life and emotional intelligence of healthcare students.

**Materials and methods**

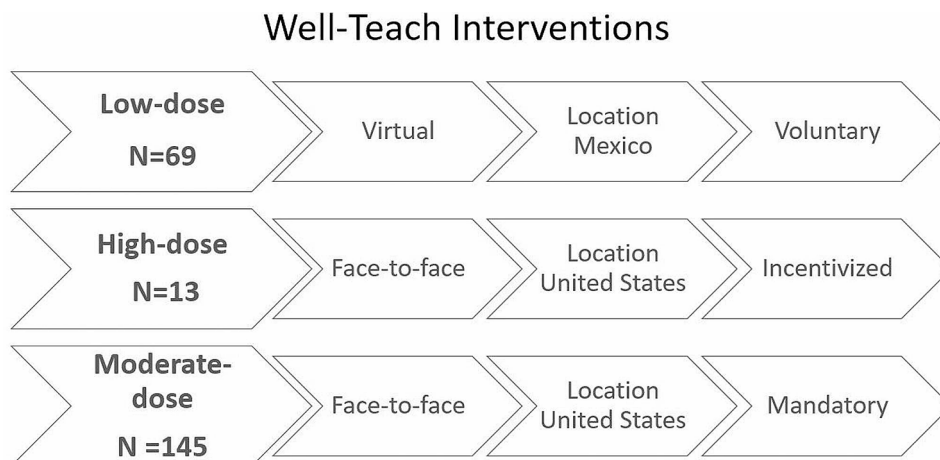
**Study design and population**

To test our wellness program, we adopted a pragmatic pre-post study design for different settings, due

to differences in the methods of implementation of our program. The program was tested in three ways by creating combinations of different lengths (intensive, moderate, or short), delivery methods (face-to-face vs. virtual), different motivations (incentive, mandatory, or volunteer participation), and different timings (during medical programs or before entering into programs) among medical and nursing students. Figure 1 provides a detailed account of the different interventions, including the specific locations where they were conducted. We sought Institutional Review Board (IRB) approval from Texas Tech University Health Sciences Center El Paso prior to initiating our study. The IRB approved our study for assessing the intervention using an incentive method, while other assessments were exempt from IRB approval as they did not meet the criteria for human subject research, per 46.102(e)(1)(ii), as the information was not identifiable.

**Well-teach wellness intervention program**

Our model is founded on two well-established theories in the field, one focusing on wellness [59] and the other on emotional intelligence [60], highlighting the importance of recognizing the interconnected nature of cognitive and emotional aspects. The program operationalizes theoretical frameworks via practical applications and tailored interventions employing an integrated instructional methodology encompassing lectures, multimedia resources, case studies for critical analysis, and interactive hands-on activities. Furthermore, it integrates practical elements such as meditation techniques, breathing exercises, and additional practices [61–63]. The wellness intervention program was overseen and conducted exclusively by the two principal investigators involved in the study, with the objective of maintaining consistency in the curriculum for the purposes of impact assessment. We believe the concepts proposed by these theories are



**Fig. 1** Well-Teach Interventions

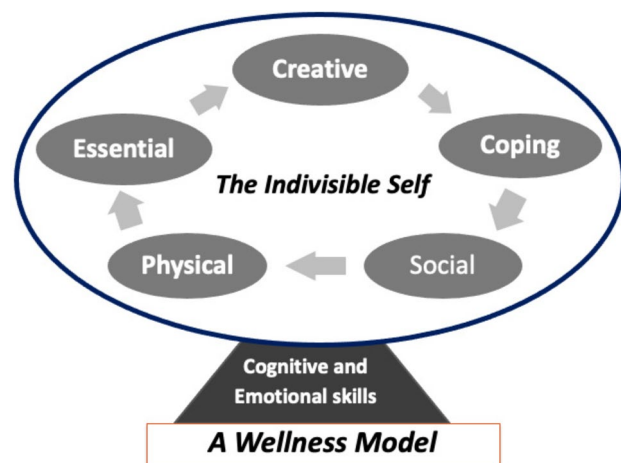
closely related and can be synergistic. Wellness theory is anchored in the Indivisible Self model that reflects a single holistic factor (“Wellness”) to which five second order factors contribute: Essential Self, the Creative Self, the Social Self, the Physical Self, and the Coping Self. Supported by research, the Indivisible-Self model has demonstrated the multiple and interrelated dimensions of wellness and is probably the most researched and well-known wellness model in the counseling profession [64]. Its structure proved ideal to be transformed into systematic presentations that would interrelate and connect with each other to build the resources healthcare students require to empower themselves, engage in a meaningful life process, and ensure their wellness is sustained over time. In the Fig. 2, we show the components of our model called Teaching Wellness “Well-Teach”.

#### Modes, doses and motivation of well-teach wellness intervention

We tested Well-Tech intervention into three modes with different strengths and timings: Low-dose virtual intervention with voluntary participation during an immersion week before classes in Mexico. High-dose face-to-face intervention for first- or second-year students with incentives in the USA. Moderate-dose face-to-face intervention requiring mandatory participation during an immersion week before classes in the USA.

#### Low-dose virtual intervention (voluntary, location Mexico)

In this mode, the intervention was delivered in 1 virtual session. The session lasted for 2 h. The quality of life, emotional intelligence, and self-efficacy were assessed before and at the end of the workshop session. Medical and nursing students had the option to voluntarily participate in the wellness workshop during immersion week prior to starting classes.



**Fig. 2** Teaching Wellness “Well-Teach” Model

#### High dose face-to-face well-teach intervention (incentivized, location United States (USA))

In this mode, the intervention was delivered in 3 face-to-face sessions separated by one day. Sessions lasted for seven and a half hours. Workshops were conducted Friday (2 h and 30 min) and Saturday (5 h) which included a light breakfast and a lunch break. The participants perception of their quality of life, emotional intelligence, and self-efficacy were assessed before, at the end of workshops, and again a month later. Enrolled participants were emailed a link to complete a 1-month posttest survey. Those who attended the workshops and completed post-intervention surveys received \$25.00, with an additional \$40.00 provided upon completion of the final survey a month later.

#### Moderate-dose face-to-face intervention (mandatory, location USA)

In this mode, the intervention was delivered in 2 face-to-face sessions separated by one day. Each session lasted for 2 h (a total of 4 h). The quality of life, emotional intelligence, and self-efficacy were assessed before and at the end of the workshop sessions. Medical and nursing students were required to participate in the wellness workshop during immersion week prior to starting classes.

#### Variables and measurement

##### Quality of life

The quality of life was measured with the World Health Organization Quality of Life Instrument (WHOQOL) questionnaire based on a brief version of the WHOQOL-BREF. This instrument is composed of 26 items with response options that vary from 1 (very dissatisfied/very poor) to 5 (very satisfied/very good). The questionnaire includes four factors: physical health, psychological health, social relations, and environment [65].

##### Cognitive and emotional skills

These skills were evaluated using two emotional intelligence instruments. The first one was the trait emotional meta-mood scale (TMMS-24) [66] adapted by Fernández-Berrocal et al. This scale is based in the original version of the trait meta-mood scale [67]. It has 24 items divided into three factors: emotional attention, emotional clarity, and emotional repair. Responses use a five-point Likert scale which ranged from 1=strongly disagree to 5=strongly agree. The second was the Wong and Law Emotional Intelligence Scale (WLEIS) [68] containing 16 items and four factors: Self Emotion Appraisals, Others’ Emotion Appraisals, Regulation of Emotion (ROE), and Use of Emotion (UOE). Each item in the WLEIS uses a 7-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree).

### Self-efficacy

The General Academic Self-Efficacy scale (GASE) [69] was used to measure academic self-efficacy in two of the sessions. The four items self-report scale measure academic self-efficacy on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

### Statistical analysis

All the scales were summarized with mean and standard deviation (SD). We applied a repeated measure analysis of variance (rANOVA) followed by Bonferroni's posthoc multiple comparisons to evaluate the effect of high-dose face-to-face Well-Teach intervention on outcome measures. In the rANOVA, the assumption of sphericity was violated, as assessed by Mauchly's test of sphericity therefore, a Greenhouse-Geisser correction was applied [70]. Paired t-tests were used to compare pre-to posttest surveys for evaluating the effects of Well-Teach interventions. The effect size was summarized with mean change along with 95%CI and percent relative improvements computed by pre-to-post scores divided by respective pre-test scores. Cohen effect sizes were used as small ( $d=0.2$ ), medium ( $d=0.5$ ), and large ( $d\geq 0.8$ ) [71]. A p-value less than 5% was considered a statistically significant result. Considering first of kin study, we did not adjust for multiplicity. All the statistical analyses were performed using IBM SPSS version 23.

## Results

### Effect of low-dose virtual well-teach intervention

The sample consisted of 44 medical students (63.8%) and 25 nurses (36.2%), with women representing 43 individuals (62.3%). The mean age was 21.46 (SD=2.8), with a range of 20 to 29 years. All scores improved except for

regulation scores. The largest improvement was noticed for quality of life in the psychological construct (mean difference=3.021, 95%CI:0.553–5.488,  $p=.008$ ), in the cognitive and emotional skills measured with the Emotional Intelligence scales in the total assessed by the TMMS-24 (mean difference=5.197, 95%CI:3.057–7.337,  $p<0.001$ ) and the mean difference for the WLEIS scale (Others' Emotions Construct) is 0.432 (0.197–0.667) (Table 1).

### Effect of high-dose face-to-face well-teach intervention

The sample consisted of 13 medical students, with women representing 9 individuals (69.2%). The mean age was 25.31 (SD=2.0), with a range of 23 to 29 years. In the quality of life survey, physical scores showed a significant improvement at 1-month following the initial intervention (mean difference=1.044, 95%CI:0.235–1.852,  $p=.011$ ), psychological scores showed a significant improvement following immediate intervention (mean difference=1.205, 95%CI:0.423–1.987,  $p=.003$ ) as well as 1-month later (mean difference=1.359, 95%CI:0.227–2.491,  $p=.018$ ). In addition, a borderline improvement in environment scores at 1-month later was also observed (mean difference=1.154, 95%CI:0.007–2.314,  $p=.05$ ). A sustained improvement was observed for cognitive and emotional skills including the two emotional intelligence scales: TMMS-24 1-Month later (mean difference=10.692, 95%CI:0.848–20.536,  $p=.032$ ) primarily driven by clarity scores and WLEIS 1-Month later (mean difference=0.519, 95%CI:0.112–0.927,  $p=.012$ ) primarily driven by self-emotions at immediate post-intervention (mean difference=0.481, 95%CI:0.100–0.862) and 1-month post-intervention (mean difference=0.712, 95%CI:0.093–1.330). In the emotional intelligence scale,

**Table 1** Effect of low dose virtual well-teach intervention on quality of life emotional intelligence and self-efficacy scores ( $n=69$ )

Outcomes	T1 (pre)	T2(post)	Change (95% CI)	P value	Effect size
Quality of life measured with WHOQOL- BREF					
Physical	14.36±2.49	14.68±2.41	0.312(0.057–0.681)	0.048	0.208
Psychological	12.77±2.99	13.41±2.79	0.646(0.283–1.010)	<0.001	0.437
Social	13.23±3.75	13.66±3.22	0.424(0.033–1.854)	0.034	0.228
Environmental	14.11±2.40	14.52±2.56	0.411(0.101–0.721)	0.005	0.326
Emotional intelligence measured with TMMS24					
Attention	27.61±7.47	29.80±7.03	2.197(1.083–3.311)	<0.001	0.485
Clarity	27.12±7.09	28.67±7.62	1.545(0.606–2.484)	<0.001	0.405
Repair	27.59±6.98	29.05±6.99	1.455(0.354–2.555)	0.005	0.325
Total	82.32±18.13	87.52±18.64	5.197(3.057–7.337)	<0.001	0.597
Emotional intelligence measured with WLEIS					
Self-emotions	4.91±1.41	5.26±1.26	0.352(0.128–0.576)	0.001	0.387
Regulation	5.46±1.09	5.63±1.13	0.167(0.044–0.377)	0.059	0.195
Use of Emotions	5.11±1.15	5.43±1.11	0.318(0.135–0.501)	<0.001	0.428
Others' Emotions	4.55±1.22	4.98±1.25	0.432(0.197–0.667)	<0.001	0.452
Total	5.01±0.93	5.32±0.99	0.317(0.173–0.462)	<0.001	0.539

WHOQOL-BREF: Quality of life; TMMS24: Emotional intelligence; WLEIS: Emotional intelligence; GAZE: Self-efficacy; CI: confidence interval

the improvement in mean total scores was observed at 1-month post-intervention only (93 vs. 104,  $p=.032$ ). This was primarily driven by clarity scores (Table 2).

### Effect of moderate dose face-to-face well-teach intervention

The sample consisted of 91 medical students (62.8%) and 54 nurses (37.2%), with women representing 95 individuals (65.5%). The mean age was 23.86 (SD=3.4), with a range of 21 to 34 years. All the scores of quality of life except for physical scores were improved following a mandatory face-to-face Well-Teach intervention. The highest improvement in scores was for psychological health (mean change=0.870, 95%CI:-0.514-1.227,  $p<.001$ ), following social health (mean difference=0.501, 95%CI:-0.193-0.809,  $p<.001$ ), and environmental health (mean difference=0.307, 95%CI:-0.073-0.541,  $p=.005$ ). Similarly, all components of cognitive and emotional skills assessed with the two emotional intelligence scales except for attention factor were found to be significantly improved following the Well-Teach intervention. The largest improvement in the TMMS-24 was observed for clarity scores (mean difference=1.441, 95%CI:0.241–2.373,  $p=.009$ ) and repair scores (mean difference=1.310, 95%CI:0.107–2.514,  $p=.017$ ). The effect of wellness intervention had the highest impact on the total emotional intelligence scores as measured by TMMS-24 (mean difference=3.021, 95%CI:0.553–5.488,  $p=.008$ ) and WLEIS (mean difference=0.192, 95%CI:0.112–0.272,  $p<.001$ ) among all surveys. In the emotional intelligence subscales, self-emotion scores (mean difference=0.234,

95%CI:0.054–0.415,  $p=.006$ ), regulation of emotions (mean difference=0.100, 95%CI:0.018–0.218,  $p=.018$ ), use of emotion scores (mean difference=0.253, 95%CI:0.149–0.358,  $p<.001$ ), and other emotion scores (mean difference=0.193, 95%CI:0.045–0.342,  $p=.006$ ) yielded significant improvements following the intervention. In addition, self-efficacy scores were also improved after intervention (mean difference=0.400, 95%CI:0.110–0.690,  $p=.004$ ) (Table 3).

### Discussion

The study findings demonstrate improved scores in all areas related to participants' quality of life, emotional intelligence, and self-efficacy. These enhancements were consistent regardless of the duration of training, the delivery method (face-to-face or virtual), participants' motivation (incentivized, mandatory or voluntary), and the intensity of the training (low, moderate, or high dose). Most scores were significantly improved except for a few factors in the high-dose face-to-face Well-Teach intervention cohort. The discrepancy may be attributed to the sample size or the nature of the intervention, which was more intensive. It is noteworthy that one month following the intervention, all scores increased in the high-dose intervention, suggesting the potential for a synergistic effect.

The studies described in the manuscript began with the program's launch at a Mexican university through virtual means and later expanded to the USA, targeting medical students and nurses. In the USA, the program started with a high-intensity voluntary participation approach.

**Table 2** Effect of high-dose face-to-face well-teach intervention on quality of life, emotional intelligence, and self-efficacy scores ( $n = 13$  students)

Outcomes	T1 (baseline pre)	T2 (immediate post)	T3 (one month later post)	T1 to T2 $p$ -value	T1 to T3 $p$ -value	Effect size at T2	Effect size at T3
Quality of life measured with WHOQOL- BREF							
Physical	15.91 ± 1.51	16.44 ± 1.75	16.96 ± 1.29	0.246	0.011	0.526	0.995
Psychological	13.23 ± 2.31	14.51 ± 2.58	14.67 ± 2.48	0.003	0.018	1.188	0.925
Social	14.87 ± 3.44	15.28 ± 4.13	16.72 ± 3.11	0.130	0.169	0.626	0.586
Environmental	15.46 ± 1.96	16.00 ± 2.40	16.62 ± 1.50	0.172	0.051	0.583	0.767
Emotional intelligence measured with TMMS24							
Attention	30.15 ± 6.50	32.33 ± 4.85	34.77 ± 2.95	0.255	0.121	0.521	0.637
Clarity	32.08 ± 5.38	33.77 ± 4.90	35.23 ± 3.52	0.584	0.037	0.381	0.815
Repair	31.00 ± 5.46	33.00 ± 4.67	33.92 ± 5.07	0.480	0.199	0.416	0.560
Total	93.23 ± 9.84	99.00 ± 9.03	103.92 ± 7.11	0.250	0.032	0.524	0.837
Emotional intelligence measured with WLEIS							
Self-emotions	5.46 ± 0.083	5.94 ± 0.77	6.17 ± 0.49	0.013	0.023	0.973	0.886
Regulation	5.88 ± 0.56	5.94 ± 0.47	6.10 ± 0.44	0.997	0.656	0.443	0.990
Use of Emotions	5.48 ± 0.81	5.63 ± 0.99	6.02 ± 0.70	0.996	0.108	0.264	0.655
Others' Emotions	5.54 ± 0.85	5.71 ± 0.84	5.90 ± 1.13	0.745	0.459	0.337	0.423
Total	5.59 ± 0.48	5.85 ± 0.58	6.11 ± 0.48	0.097	0.012	0.671	0.982
Self-efficacy measured through GAZE							
Self-Efficacy	16.08 ± 3.69	16.39 ± 3.36	17.38 ± 2.99	0.970	0.164	0.181	0.591

WHOQOL-BREF: Quality of life; TMMS24: Emotional intelligence; WLEIS: Emotional intelligence; GAZE Self-efficacy

**Table 3** Effect of moderate dose face-to-face well-teach intervention on quality of life, emotional intelligence, and self-efficacy scores ( $n = 145$  students)

Variables	T1 (pre)	T2(post)	Change (95% CI)	p value	Effect size
Quality of life measured with WHOQOL- BREF					
Physical	15.81 ± 2.13	15.90 ± 2.17	0.087(-0.316-0.143)	0.228	0.062
Psychological	13.90 ± 2.62	14.77 ± 2.46	0.870(0.514–1.227)	<0.001	0.402
Social	15.45 ± 3.08	15.95 ± 2.90	0.501(0.193–0.809)	<0.001	0.267
Environmental	15.62 ± 2.25	15.92 ± 2.37	0.307(0.073–0.541)	0.005	0.215
Emotional intelligence measured with TMMS24					
Attention	35.90 ± 8.96	36.17 ± 9.88	0.269(0.907–1.445)	0.326	0.038
Clarity	35.58 ± 8.64	37.02 ± 9.93	1.441(0.241–2.642)	0.009	0.197
Repair	36.94 ± 8.92	38.26 ± 9.76	1.310(0.107–2.514)	0.017	0.179
Total	108.42 ± 19.95	111.44 ± 24.42	3.021(0.553–5.488)	0.008	0.201
Emotional intelligence measured with WLEIS					
Self-emotions	5.61 ± 1.01	5.84 ± 0.88	0.234(0.054–0.415)	0.006	0.213
Regulation	5.75 ± 0.92	5.85 ± 0.92	0.100(0.018–0.218)	0.048	0.139
Use of Emotions	5.81 ± 0.93	6.06 ± 0.82	0.253(0.149–0.358)	<0.001	0.397
Others' Emotions	5.31 ± 1.25	5.50 ± 1.18	0.193(0.045–0.342)	<0.006	0.213
Total	5.62 ± 0.71	5.81 ± 0.72	0.192(0.112–0.272)	<0.001	0.201
Self-efficacy measured with GAZE					
Self-Efficacy	19.30 ± 3.05	19.70 ± 2.95	0.400(0.110–0.690)	0.004	0.227

WHOQOL-BREF: Quality of life; TMMS24: Emotional intelligence; WLEIS: Emotional intelligence; GAZE: Self-efficacy; CI: confidence interval

Despite achieving satisfactory results with a limited number of participants, it was evident that challenges commonly found in academic literature persisted, particularly related to engagement. Reasons for non-participation, according to those who did attend, included those non-participants were stressed, overwhelmed, and felt that they could not devote those hours to a workshop when they could be using that time to prepare for their academic demands. Thanks to the institutional support and endorsement from organizational leaders which enabled the introduction of mandatory workshops before classes, it was possible to delve deeper into the holistic wellness model. This became achievable following the demonstration of alignment with crucial competencies in medical and nursing preceptorships, indicating that integrating wellness workshops into the curriculum could be a promising and feasible strategy.

In order to have a sustainable cultural shift, Wellness needs to become part of their workload and might be part of their learning/recall of lifelong wellness resources, tools and competencies. For example, those included by the Accreditation Council for Graduate Medical Education (ACGME) involving competencies in patient care, knowledge for practice, practice-based learning and improvement, interpersonal and communication skills, professionalism, systems-based practice, interprofessional collaboration, and personal and professional development for medical students [72, 73]. Nursing student competencies and sub-competencies identified in the © 2021 American Association of Colleges of Nursing curriculum [74] suggest the workshop can be linked to Person-Centered Care, Population Health, Quality and

Safety and Interprofessional Partnerships competencies. In the Mexican university included in this study the competencies are regulated by the “Consejo Mexicano para la acreditacion de la educacion médica A.C.” and the “School of Nursing from the Consejo Mexicano para la acreditación de enfermería A.C.”

The study faced limitations like a small sample size in the high-dose face-to-face voluntary intervention, a 54% attrition rate (with only 13 out of 35 students participating). Missing results due to data matching challenges. While all students in the USA. intervention cohort attended the mandatory workshops as part of the Well-Teach intervention, which included a moderate dose of face-to-face interaction, the pre-post measures could not be matched due to errors made by participants in recalling and entering their anonymous IDs. The same thing happened in Mexico with the voluntary workshop, which reduced the sample size; providing students with pre-assigned IDs rather than requiring them to create their own is recommended. The sample includes only students from the school of Medicine and Nursing at two universities, one in the USA and one in Mexico, and may not be generalizable. These workshops have not been tested against another intervention or a placebo-control group that may achieve similar results. Longitudinal measures to observe the effects at long term, were not collected in all the intervention cohorts with the exception of one short measure at one month in high-dose face-to-face voluntary intervention. Improvements in the outcome measures considered may not necessarily be related to our Well-Teach Workshop with respect to wellness, cognitive and emotional abilities, and/or effectiveness,



but may be attributable to other causes. Organizational change was not assessed in the present study because our proposal posits the need for preliminary steps to cultivate a culture of wellness that can foster both individual and organizational change in the future. Therefore, it is possible that the implementation of these initial steps may not have a long-term and/or organizational impact. The wellness model, despite limitations, demonstrated a systematic benefit with consistent perceived improvement sustained for one month, suggesting the potential for a synergistic effect. The workshops (not presented here) were met with high satisfaction by participants, which may prove to be an effective strategy for addressing the challenges of low engagement and/or attrition. By incorporating wellness into their practices, students can understand the lasting importance of well-being and adhere to its principles.

Moving forward, it is essential to assess the competencies and skills acquired in wellness and determine their long-term sustainability in future studies. Success in future studies must be evaluated by assessing the competencies and skills acquired in relation to wellness, and whether these are sustained in the long term. Organizational transformations post-pandemic, driven by visionary leadership, underscore the imperative of cultivating, appreciating, and nurturing a wellness-oriented culture to ensure that these changes become intrinsic to the organization and ingrained as a personal philosophy of life at the individual level [75]. Nevertheless, in order to implement and evaluate organizational changes, it is necessary to consider that the question of why wellness is relevant is not the issue at hand. In contrast, greater significance is ascribed to the question of how to implement comprehensive wellness programs that demonstrate tangible outcomes at the individual level, as a precursor to achieving and maintaining the requisite organizational changes. In order to support and sustain the investment required, a culture of wellness is necessary and can start by considering preliminary early steps in education. Based on our experience, it is advised that these steps be included in the curriculum by taking a holistic approach, in line with the approach used in this study. The concept of wellness permits a multiplicity of approaches to its delivery, reflecting the intrinsic diversity of human beings and their needs. The advent of new pedagogical approaches has been accompanied by a shift in the very nature of learning and teaching. This suggests that the implementation of a culture of wellness will necessarily evolve in response to these changes.

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#### Author contributions

Conceptualization, data curation, investigation, supervision, methodology, formal analysis, validation, writing original draft of manuscript – Marie Leiner & Beverley Argus-Calvo. Data curation, investigation, supervision, validation, review of and editing manuscript – Maureen Frances, Paul CarrolaMethodology, writing original draft of manuscript- Deborah Clegg & Alok Dwivedi.

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#### Data availability

Data availability: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request before acceptance. The data will be available in a public repository database. The DOI/accession codes will be made available at acceptance.

#### Declarations

##### Ethics approval and consent to participate

We sought Institutional Review Board (IRB) approval from Texas Tech University Health Sciences Center El Paso prior to initiating our study. The IRB approved our study for the assessment of our intervention based on an incentive method waving informed consent while other assessments were exempted from IRB approval as they did not meet the definition of human subject research, per 46.102(e)(1)(ii), as the information was not identifiable. During workshops offered to students in the USA and Mexico, this unidentified data was collected voluntarily.

##### Consent for publication

All authors have contributed substantially to the conception of the work that has not been submitted for publication elsewhere and have given consent for publication.

##### Clinical trial number

A clinical trial number was not obtained because our research study did not prospectively assign people or groups of people to receive one or more health-related interventions to evaluate the effects on health outcomes.

##### Competing interests

The authors declare no competing interests.

##### Author details

<sup>1</sup>Department of Counseling, Special Education and Educational Psychology, University of Texas at El Paso, El Paso, TX, USA

<sup>2</sup>Department of Internal Medicine, Texas Tech University Health Sciences Center El Paso, El Paso, TX, USA

<sup>3</sup>Paul Foster School of Medicine, El Paso, TX, USA

<sup>4</sup>Department of Molecular and Translational Medicine, Paul L. Foster School of Medicine, Biostatistics and Epidemiology Consulting Lab, Office of Research, Texas Tech University Health Sciences Center El Paso, El Paso, TX, USA

<sup>5</sup>Department of Counseling, Special Education and Educational Psychology, University of Texas at El Paso, El Paso, TX, USA

<sup>6</sup>Department of Pediatrics, Texas Tech University Health Sciences Center El Paso, El Paso, TX, USA

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