Protocol

Psychological Health and Wellness and the Impact of a Supportive Text Messaging Program (Wellness4MDs) Among Physicians and Medical Learners in Canada: Protocol for a Longitudinal Study

Reham Shalaby¹, MD, PhD; Belinda Agyapong¹, BSc, MEd; Raquel Dias^{1,2}, PhD; Gloria Obuobi-Donkor^{1,2}, MSc; Medard K Adu^{1,2}, MSc; Sharron Spicer³, MD, PhD; Natalie L Yanchar⁴, MD, PhD; Vincent I O Agyapong^{1,2}, MD, PhD

Corresponding Author:

Vincent I O Agyapong, MD, PhD
Department of Psychiatry
Faculty of Medicine
Dalhousie University
5909 Veterans Memorial Lane, 8th Floor
Abbie J. Lane Memorial Building QEII Health Sciences Centre
Halifax, NS, B3H 2E2
Canada

Phone: 1 780 215 7771 Email: agyapong@ualberta.ca

Abstract

Background: Burnout, anxiety, and depression continue to affect physicians, postgraduate medical trainees, and medical students globally and in Canada particularly after the COVID-19 pandemic.

Objective: The primary goal of this project is to design, implement, monitor, and evaluate a daily supportive SMS text messaging program (Wellness4MDs, Global Psychological e-Health Foundation). The program aims to reduce the prevalence and severity of burnout, anxiety, and depression symptoms among physicians, postgraduate medical trainees, and medical students in Canada.

Methods: This longitudinal study represents a multistakeholder, mixed methods, multiyear implementation science project. Project evaluation will be conducted through a quantitative prospective longitudinal approach using a paired sample comparison, a naturalistic cross-sectional controlled design, and satisfaction surveys. Prevalence estimates for psychological problems would be based on baseline data from self-completed validated rating scales. Additional data will be collected at designated time points for paired comparison. Outcome measures will be assessed using standardized rating scales, including the Maslach Burnout Inventory for burnout symptoms, the 9-item Patient Health Questionnaire for depression symptoms, the 7-item Generalized Anxiety Disorder scale for anxiety symptoms, and the World Health Organization—Five Well-Being Index.

Results: The project launched in the last quarter of 2023, and program evaluation results will become available within 36 months. The Wellness4MDs program is expected to reduce the prevalence and severity of psychological problems among physicians in Canada and achieve high subscriber satisfaction.

Conclusions: The results from the Wellness4MDs project evaluation will provide key information regarding the effectiveness of daily supportive SMS text messages and links to mental health resources on these mental health parameters in Canadian physicians, postgraduate trainees, and medical students. Information will be useful for informing policy and decision-making concerning psychological interventions for physicians in Canada.

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¹Department of Psychiatry, University of Alberta, Edmonton, AB, Canada

²Department of Psychiatry, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada

³Office of the Chief Medical Officer, Alberta Health Services, Calgary, AB, Canada

⁴Department of Surgery, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada

KEYWORDS

wellness; doctors; Canada; depression; burnout; anxiety; supportive text messages; eHealth

Introduction

Burnout, anxiety, and depression continue to be a problem among physicians globally and in Canada. The recent Canadian Medical Association National Physician Health Survey shows that the well-being of physicians across Canada has significantly decreased [1]. The survey demonstrates that many physicians report poorer mental health than before the COVID-19 pandemic, with 53% of respondents nationally reporting symptoms of burnout, including emotional exhaustion [1]. According to the Medscape National Physician Burnout and Suicide Report, the burnout rate among physicians was reported to be as high as 42% in 2020, compared with 39% in 2013 [2,3]. Similarly, high rates were reported for residents with scores between 41% and 74% across different specialties [4]. Furthermore, 27% of residents stated that they rarely or never had time to lead a satisfying social life; of these, 68% reported having failed relationships for this reason [5,6].

During the COVID-19 pandemic, these figures increased further with about 60% of physicians in Canada reporting that their mental health worsened after the pandemic [7]. Similarly, 35% of a sample of emergency residents demonstrated symptoms of posttraumatic stress disorder acutely during the COVID-19 pandemic crisis [8].

The impact of burnout on the physician workforce is substantial, including a higher likelihood for medical errors, lower quality of care, higher costs, and overall worse outcomes along with reduced patient satisfaction [9-12]. Physicians reporting burnout symptoms work for fewer hours and leave clinical medicine at a higher rate than those not affected, and the resultant decreased productivity may exacerbate physician shortfall [13-15]. In addition, physicians with high levels of distress and burnout are more prone to self-perceived or reportedly commit medical errors [4,16,17]. Furthermore, the risk of depression, stress, alcohol use, and suicidality were increasingly reported among postgraduate trainees who have experienced more working hours, burnout, and less sleep time [4,17,18]. On the other hand, physicians who have high empathy and more positive attitudes tend to demonstrate positive attributes with better clinical outcome profiles in terms of developing better doctor-patient relationships associated with a high patient satisfaction and moral reasoning with clinical competence [19-21]. A recent study investigated the strength and significance of the associations of health workforce with multiple health outcomes and COVID-19 excess deaths across countries, using the latest World Health Organization dataset [22]. The study reported that a higher aggregate density of health human resources, particularly physicians, was significantly associated with healthy life expectancy at birth [22].

Addressing stress and burnout among physicians, postgraduate trainees, and medical students is a priority, given that decreasing rates of medical professionals usually seek psychological help or support. In a study among university hospital physicians in Europe, it was reported that overall, more than 3 in 4 distressed

physicians had never sought professional help for depression or burnout [23]. In another study that evaluated the help-seeking behaviors of medical students with burnout and compared their stigma perceptions with those of the general US population and age-matched individuals, it was reported that only a third of respondents with burnout (154/454, 33.9%) sought help for an emotional or mental health problem in the last 12 months [24]. Furthermore, medical students with burnout were more likely than those without burnout to agree or strongly agree with 8 of 10 perceived stigma items [24]. It is well-recognized that the stigma and potential professional reputational damage associated with seeking help for mental health problems often deter many physicians, residents, and medical students from seeking psychological support when they are stressed, burnt out, or dealing with anxiety or depression.

Thus, there was a need for an evidence-based, technology-enabled, cost-effective, and geographic location-independent mental health service to address the psychological problems faced by physicians, postgraduate trainees, and medical students. Previous research examining supportive SMS text messages has demonstrated positive outcomes, in terms of improved clinical symptoms and high user satisfaction [25-27]. In a rigorous evaluation of Text4Mood, an SMS text messaging service launched in Fort McMurray, Alberta to address unmet psychological treatment gaps, it was reported that supportive SMS text messages helped the majority of the subscribers feel more hopeful about managing issues (82%), in charge of managing their depression and anxiety (77%), and connected to a support system (75%). Furthermore, a majority reported that the intervention improved their overall mental well-being (83%) [26]. Similar findings were observed in other contextual studies, such as Text4Baby and quit4baby; the 2 programs that have sought to assist women by providing supportive and informative SMS text messaging during pregnancy [28,29]. Participants in such services indicated that receiving these messages gave them a sense of reassurance and made mothers feel supported, particularly in disadvantaged communities [30]. Similarly, texting services, such as Text4Support, have effectively reduced the risk of harm to self and other harm symptoms after 6 months of intervention in a randomized controlled trial [31] and reduced distress, anxiety, and depression symptoms in clinical samples [32]. In addition, the Text4PTSI program has achieved fidelity and significantly reduced psychological distress among public safety personnel post intervention [33,34]. Furthermore, during the COVID-19 pandemic, people needed to feel connected to a health support system. Text4Hope service was provided to support the mental health of the general public in Alberta; the service reported a significant reduction in stress, anxiety, depression symptoms, and suicidal ideation during the pandemic [35-38]. Another related service, the Text4Hope-Addiction program was introduced to people living with substance use disorders [39]. The service reported significant improvement in standardized measures for craving, anxiety, and depression in subscribers. SMS text message-based population-level messaging programs



have reported user satisfaction rates of well over 80%, and most subscribers have reported feeling connected to support systems and improving their ability to manage anxiety, depression, and general life issues, suggesting an improvement in mental health literacy [26,27,40-42].

In this study, we propose the Wellness4MDs (Global Psychological e-Health Foundation) initiative, a text-based proposed program that will deliver daily supportive and informative SMS text messages with or without embedded web links for mental health support or literacy resources to the physicians in Canada for 6 months. The Wellness4MDs program SMS text messages are based on cognitive behavioral therapy (CBT) principles and developed by psychiatrists, mental health therapists, clinical psychologists, and users of mental health services. Wellness4MDs program may help provide a first-line intervention that addresses the help-seeking barrier of stigma that fits with the busy lifestyle of physicians, postgraduate trainees, and medical students.

The goal of this project is to support the mental health of physicians, postgraduate trainees, and medical students in Canada using a daily supportive SMS text message. We aim, first, to evaluate the prevalence and correlates of burnout and probable mental health symptoms and, second, to determine if daily supportive SMS text messages can help reduce the prevalence and severity of these symptoms and improve well-being among subscribers in Canada. We will also assess the experience and satisfaction of the Wellness4MDs program subscribers with the daily supportive SMS text messaging program.

Methods

Study Design

This is a quantitative longitudinal study with data collected from subscribers of the Wellness4MDs program using a web-based survey at the onset of the program and at designated follow-up timepoints. The surveys will include questions related to sociodemographic characteristics, roles, years of training, specialty, work, and clinical information. The Wellness4MDs program will deliver daily supportive and informative SMS text messages with or without embedded web links for mental health support or literacy resources to subscriber cell phones for 6

months. Participation in the surveys would be voluntary, and nonparticipation in any of the surveys will not impact program participation or service delivery. The Wellness4MDs is a national collaborative project that will leverage stakeholder partnerships to disseminate the program to physicians, postgraduate trainees, and medical students. Potential collaborating organizations include the Royal College of Physicians and Surgeons of Canada, faculties of medicine across Canada, provincial medical associations, provincial health authorities, and provincial medical licensing colleges. Initially, promotional material will be provided and give an overview of the Wellness4MDs program and information about how physicians, postgraduate medical trainees, and medical students can subscribe and unsubscribe to the program. Collaborating organizations will be requested to share information about the Wellness4MDs program with physicians, postgraduate medical trainees, and medical students on their databases and social medical handles, including Facebook, LinkedIn, Instagram, and Twitter (rebranded as X). Thus, the Wellness4MDs recruitment plan will mirror the successful recruitment plan of similar programs in Alberta, including the Text4Hope program that was launched in response to COVID-19 in March 2020 [36,37,43] as a collaborative initiative between the University of Alberta, Alberta Health Services, and six health foundations. Text4Hope was the subject of a wide-exposure communications campaign (television, radio, internet, and print media), including the local provincial mental health foundation, Alberta Health Services, and a media release by the provincial chief medical officer [44].

Study Setting and Participants

The bilingual Wellness4MDs program will enroll physicians, postgraduate trainees, and medical students in all provinces and territories in Canada. In 2021, the total number of physicians in Canada was 108,040, according to the annual census [45]. According to the Canadian Medical Association, the total number of residents in all postgraduate programs in 2018-2019 was 16,508, and the total enrollment in undergraduate medical schools in Canada in 2017-2018 was 11,737 [46].

Program Timelines

The Wellness4MDs initiative will be a 3-year project, with timelines as detailed in Table 1.



Table 1. Wellness4MDs project Gantt chart.

Milestones	Year 1			Year 2					Year 3			
	Q1 ^a	Q2 ^b	Q3 ^c	Q4 ^d	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Milestone 1: recruitment of a project staff and creation of the bank of supportive SMS text messages

- 1.1 A project coordinator and evaluation specialist would be recruited to support project coordination, implementation, monitoring, and evaluation
- 1.2 Review and adaptation of the bank of supportive SMS text messages and creation of new messages for the Wellness4MDs program by an expert group

Milestone 2: launch of the Wellness4MDs program, advertisement, and delivery of service

2.1 Recruitment	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2.2 Provision of the service	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Milestone 3: evaluation of the service, including clinical ass	essment	and sat	isfactio	on of th	e partio	cipants,	and st	akehold	lers' fe	edbacks	3
3.1 Baseline survey (excluding satisfaction survey)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.2 Follow-up survey (including satisfaction survey)		✓	✓	✓	✓	✓	✓	✓	✓	1	✓
3.3 Key informant interviews and Focus group work-					1				1		

Milestone 4: data compilation, analysis, and preparation of reports, publications, and presentations for multi-scale dissemination

shops

Wellness4MDs Program

The Wellness4MDs program is modeled on the highly successful Text4Hope and Wellness4Teachers initiatives in Canada [35,47]. The program is powered by the ResilienceNHope software, a web-based application that delivers the suite of supportive SMS text and email messaging programs, including Text4Mood, Text4Hope, Wellness4Teachers, Text4PTSI, Text4Wellness, and MoreGoodDays [48]. Canadian physicians, postgraduate trainees, and medical students will be able to subscribe to the Wellness4MDs program by texting "WellMD" to a designated phone number. Individuals can unsubscribe to the program by simply texting "stop" to the program phone number. The Wellness4MDs program will deliver daily supportive and informative SMS text messages (some with embedded web links for mental health support or literacy resources) to subscriber cell phones for 6 months. The Wellness4MDs program SMS text messages are based on CBT principles and were developed by psychiatrists, mental health therapists, clinical psychologists, and users of mental health services. About a third of the SMS text messages will have embedded web links that include additional physician health and wellness resources from reputable sources.

Examples of SMS Text Messages

The following are example SMS text messages that will be sent.

- "Perfectionism can cause anxiety. Remember a perfect work environment does not exist. Try deliberately being imperfect and see what happens. Do your anxious thoughts come true? Remember that there are many possibilities in life. Try not to limit yourself from enjoying all that is possible." In addition, an embedded web link has been provided [49].
- 2. "We each have different signature strengths. It's not about competing with others but learning our unique strengths. Strengths come in many varieties, such as humor, curiosity, persistence, kindness, love, forgiveness, cooperativeness, and optimism. Share your strength with others. Help a struggling colleague."
- 3. "Problems are almost never solved in one step. See if you can break the problem into steps. Take the first step today by starting with a manageable situation. Get the support of a friend, family, colleagues, or supervisor." In addition, an embedded web link has been provided [50].

Hypothesis

We hypothesize that the Wellness4MDs program will achieve (1) at least a 20% reduction in mean scores for burnout, anxiety, and depressive symptoms on validated scales and a 20% increase in self-reported well-being at 6 weeks, 3 months, and 6 months after receiving the service, and (2) at least 80% of subscribers will express satisfaction with the program and perceive the daily



^aQ1: first quarter.

^bQ2: second quarter.

^cQ3: third quarter.

^dQ4: fourth quarter.

supportive SMS text messages as contributing to their overall mental well-being.

Sample Size Calculation

With a projection that the effect size for the reduction in mean 7-item Generalized Anxiety Disorder (GAD-7) scale and 9-item Patient Health Questionnaire (PHQ-9) scores at 6 months from baseline would be 0.1, a population variance of 1 for each scale mean score, a 2-sided significance level α =.05, and a power of 90% (β =.1), using a web-based script [51], we estimated that the sample size needed to assess the effects of the daily supportive SMS text messages on the outcome variables would be 1053.

Data Collection and Outcome Measures

The project will run for 3 consecutive years. Quantitative data will be collected from subscribers of the Wellness4MDs program using a web-based survey at the onset of the program (baseline), 6 weeks, 3 months (midpoint), and 6 months (end of service) as illustrated in Table 2. The surveys will include demographic questions such as sex and gender, as well as information about their role (physicians, postgraduate trainees, or medical students), their years of training or practice, and their specialty of retaining or practice if they are residents or physicians, in addition to the clinical outcome measures.

Primary outcome measures include changes in the mean scores on the PHQ-9 [51], the GAD-7 [52], the Maslach Burnout Inventory (MBI) [53], and the World Health Organization-Five Well-Being Index (WHO-5) [54] for subscribers from baseline to 6 weeks, 3 months, and 6 months.

The PHQ-9 is a self-administered scale designed to measure likely depression. It is an effective tool for patients and a

validated tool for screening of depressive symptoms among the general population [55]. Symptoms experienced by patients during the 2 weeks before answering questionnaires are considered. Scores range from never (0), several days (1), more than half of days (2), to 3 (nearly every day), with every item ranging from 0 to 27 [51,56]. The tool's reliability and validity have shown good psychometric properties with accepted sensitivity using 10 or above as a cutoff score and high internal consistency (Cronbach α =0.79) [55,57].

The GAD-7 scale is a self-administered valid tool designed to measure likely anxiety [58,59]. The 7 self-reported items are used to assess the severity of generalized anxiety disorder (GAD) symptoms over the past 2 weeks. Ratings are based on a 4-point Likert scale: not at all sure (0), several days (1), over half the days (2), and nearly every day (3). The scores ranged from 0 to 21, with higher scores indicative of more severe symptoms. A sensitivity of 89% and a specificity of 82% for a cutoff score of 10 [59] are considered. The GAD-7 also showed good test-retest reliability (intraclass correlation 0.83), as well as excellent internal consistency (Cronbach α =0.92) [58,60].

The WHO-5 is a self-reported measure of subjective well-being that is highly useful in clinical practice and in research studies to assess well-being over time or to compare well-being between groups [61]. The scale includes 5 positively worded items with a 6-point Likert scale used to assess participant's feelings in the last 2 weeks, ranging from 0 (not present) to 5 (constantly present). The raw scores are transformed into a score from 0 (worst thinkable well-being) to 100 (best thinkable well-being) [62]. Having a score <50 indicates poor emotional well-being and requires further evaluation. The WHO-5 demonstrated satisfactory internal consistency reliability and concurrent validity with other scales [61,62].

Table 2. Client-oriented outcome measures and feedbacks and experiences of clients and stakeholders.

Construct	Tool (scale)	$T_0^{\ a}$	T_1^{b}	$T_2^{\ c}$	T_3^d
Likely MDD ^e	PHQ-9 ^f	✓	✓	✓	√
Likely GAD ^g	GAD-7 ^h	✓	✓	✓	✓
Burnout	Maslach Burnout Inventory	✓	✓	✓	✓
Mental well-being	WHO-5 ⁱ	✓	✓	✓	✓
Satisfaction with the service	Standardized satisfaction survey		✓	✓	✓
Experience and feedback	Focus groups and key informant interviews				✓

^aT₀: baseline timepoint.

The MBI, a short questionnaire-based tool, is designed to measure the symptoms and severity of burnout. In total, 3 main

domains are examined, that are depersonalization, emotional exhaustion, and professional fulfillment index. The professional



^bT₁: 6-week timepoint.

^cT₂: 3-month timepoint.

^dT₃: 6-month timepoint.

^eMDD: major depressive disorder.

^fPHQ-9: 9-item Patient Health Questionnaire.

^gGAD: generalized anxiety disorder.

^hGAD-7: 7-item Generalized Anxiety Disorder.

¹WHO-5: World Health Organization-Five Well-Being Index.

fulfillment index includes 2 domains, that are work exhaustion and interpersonal disengagement (Burnout scale) and the professional fulfillment scale. The reliability of MBI is supported by several studies, where Cronbach α ratings of 0.90 for emotional exhaustion, 0.76 for depersonalization, and 0.76 for personal accomplishment [63].

Secondary outcome measures include changes in prevalence in subscribers of burnout, likely GAD and likely major depressive disorder (MDD), from baseline to 6 weeks, 3 months, and 6 months measured using the GAD-7, the PHQ-9, and the MBI. Other secondary outcome measures include subscriber satisfaction.

Statistical Analysis

Quantitative data will be analyzed with descriptive statistics, paired *t* test, and chi-square tests using SPSS Statistics for Windows (Version 25; IBM Corp) [64]. Descriptive data will be presented as numbers and percentages. Paired *t* test will be used to assess the differences in the mean scores of each of the outcome scales for the baseline and the follow-up time points. In addition, the chi-square test will be used to compare the prevalence of burnout, likely GAD and likely MDD, from baseline to the follow-up time points.

Ethical Considerations

This study has been approved by the human ethics review boards of the University of Alberta (Pro00129541). Informed consent will be implied if subscribers access the study information leaflet, complete the survey questions, and submit responses. Study data will be anonymized and deidentified using encrypted files that will be accessible only to the principal investigator and the research coordinator. No identification of individual participants in any images of the paper or supplementary material. No compensation will be used. No incentives will be provided to the study participants.

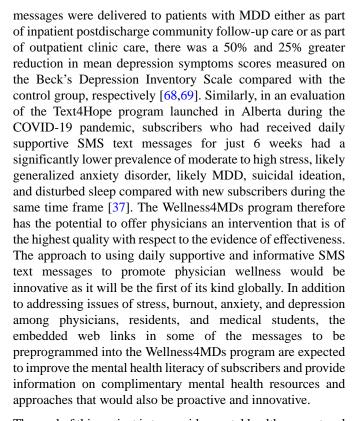
Results

The project was launched in the fourth quarter of 2023, and program evaluation results will become available by January 2027. Aligned with similar previous initiatives, the Wellness4MDs program is expected to reduce the prevalence and severity of psychological problems among physicians in Canada and achieve high subscriber satisfaction.

Discussion

Principal Findings

The Wellness4MDs project represents an innovative initiative that aligns with 2 main strategic directions, namely, highest quality and proactive and innovative approach. In terms of highest quality, the evidence in favor of the potential effectiveness of the Wellness4MDs program to alleviate stress, burnout, anxiety, and depression among physicians, postgraduate medical trainees, and medical students is derived from meta-analyses of randomized controlled trials and evaluations of related population-level interventions [26,31,32,36-38,40,65-67]. For example, in 2 randomized controlled trials, when CBT-based daily supportive SMS text



The goal of this project is to provide mental health support and information about available resources to physicians, postgraduate medical trainees, and medical students in Canada through a daily supportive SMS text message program. Similar to the impressive uptake by teachers in Canada of the Wellness4Teachers program (close to 2000 teachers subscribed within 3 months) [47], we anticipate high subscriptions to the Wellness4MDs program from physicians, postgraduate medical trainees, and medical students across Canada. Furthermore, similar to outcomes achieved from the Text4Hope program launched for the general public during the COVID-19 pandemic, we anticipate that the Wellness4MDs program will reduce stress, burnout, anxiety, and depression among physicians, postgraduate medical trainees, and medical students. The expected long-term outcomes could include lower rates of absenteeism due to stress and burnout, reduced physician turnover, reduced medical errors in clinical practice, better safety profile of patients and patient satisfaction, and fewer patient complaints. Thus, we anticipate the benefits of the Wellness4MDs program will lead to better health profiles for physicians, postgraduate medical trainees, and medical students, and the health care system will ultimately benefit through cost savings from the avoidance of expenses that directly relate to or stem from these activities.

Limitations of the Study

This study has a number of limitations. First, the self-reported scales to be used for assessment of the psychological problem, although validated, are not diagnostic. In addition, it is highly probable that the physicians, postgraduate medical trainees, and medical students who are impacted by burnout, stress, or anxiety may be more likely to subscribe to the Wellness4MDs program and so be overrepresented in this study, and thus impact the generalizability of the prevalence estimated for psychological problems. Finally, the duration of the intervention is limited for



6 months; thus, the long-term outcomes after cessation of the service will not be established. These limitations notwithstanding, this study is the first to provide e-mental health support for stress, burnout, anxiety, and depression among physicians, postgraduate medical trainees, and medical students in Canada. This study is a pioneer in assessing if daily supportive SMS text messages delivered through the Wellness4MDs program can reduce the prevalence and severity of stress, burnout, anxiety, and depression, and improve well-being among physicians, postgraduate medical trainees, and medical students. The findings would therefore be of interest to policy makers, especially those working in the health care sector.

Conclusion

The Wellness4MDs program is an innovative first-line population-level, cost-effective, and easily scalable e-mental health program that is expected to reduce psychological problems in physicians, postgraduate medical trainees, and medical students in Canada. The successful implementation of Wellness4MDs and positive outcomes will provide the imperative and overarching guidance on the design, implementation, and evaluation of similar e-mental health interventions tailored for the health workforce globally, including nurses and allied health professionals.

Acknowledgments

Wellness4MDs program would be promoted through collaborating organizations in each province, including but not limited to the Alberta Health Services, Nova Scotia Health Authority, College of Physicians and Surgeons of Nova Scotia, Dalhousie University, and the University of Alberta.

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Data Availability

The datasets generated or analyzed during this study are available from the corresponding author upon reasonable request.

Authors' Contributions

Conceptualization was performed by VIOA. Methodology was performed by VIOA, RS, BA, RD, GOD, MKA, SS, and NLY. Resources were contributed by VIOA. Writing of the original draft was done by RS and VIOA. Reviewing and editing were performed by RS, BA, RD, GOD, MKA, SS, NLY, and VIOA. Project administration and funding acquisition were handled by VIOA. All authors have read and agreed to the published version of the paper.

Conflicts of Interest

None declared.

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Abbreviations

CBT: cognitive behavioral therapy **GAD:** generalized anxiety disorder

GAD-7: 7-item Generalized Anxiety Disorder

MBI: Maslach Burnout Inventory **MDD:** major depressive disorder

PHQ-9: 9-item Patient Health Questionnaire

WHO-5: World Health Organization-Five Well-Being Index



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