

Impact of a Residency-Integrated Wellness Program on Resident Mental Health, Sleepiness, and Quality of Life

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BACKGROUND: Physicians are poorly trained in balancing the demands of a career in medicine and maintaining personal health. Physician burnout occurs due to demanding hours and psychological conditions unique to the field. Programs that address overall well-being early in residency are necessary to prevent physician burnout and promote physician mental health.

OBJECTIVE: To determine the impact of a wellness initiative on anxiety, depression, quality of life, and sleepiness among the resident participants.

METHODS: A wellness program was initiated and available to resident physicians in the Medical University of South Carolina Department of Neurosurgery. Participants attended weekly group workout sessions with biweekly lectures on mental health and sleep hygiene. Eight resident participants underwent baseline and final psychological testing in July 2015 and June 2016 including the Personal Health Questionnaire Depression Scale, the Generalized Anxiety Disorder 7-Item Scale, the Quality of Life Scale, and the Epworth Sleepiness Scale. Participant perceptions of the program were also assessed with an anonymous survey.

RESULTS: At the conclusion of the pilot year, improvements were observed in anxiety scores (4 to 2.1; $P = .039$), quality-of-life scores (82.4 to 95.4; $P = .007$), and sleepiness (8.3 to 5.7; $P = .019$). In general, resident perceptions of the program were favorable.

CONCLUSION: Residency-incorporated wellness programs are achievable and can benefit resident mental health. Lack of a control group limits the interpretation of the results. Programs such as these may be implemented to promote well-being and combat physician burnout and its associated mental health abnormalities.

KEY WORDS: Exercise, Lifestyle, Mental health, Nutrition, Quality of life, Well-being, Wellness initiative

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In line with the Accreditation Council for Graduate Medical Education (ACGME) 6 core competencies, the goal of any postgraduate medical training program should not merely be to prepare its trainees with medical knowledge and skills to function as independent physicians, but also equip them with the necessary tools to maintain habits of lifelong learning and personal well-being.¹ This is necessary so that they may lead long, satisfying, and productive careers. The challenges to maintaining a healthy lifestyle for the resident physician are daunting and lead to the culti-

vation of unhealthy habits. High stress, social isolation, depersonalization of care, increasing administrative work burden, long hours, alternating shift² and sleep cycles, and³⁻⁵ lack of exercise⁶⁻⁹ contribute to an environment that promotes poor mental health.¹⁰ In fact, the second leading cause of death among resident physicians is suicide. In addition to being a threat to the resident physician, physician burnout and depression, reported in the majority (47%-70%) of resident physicians across diverse specialties, is a known contributor to suboptimal patient care.¹¹⁻¹⁸

We have implemented a voluntary wellness initiative for the residents of the Department of Neurosurgery at the Medical University of South Carolina. This quality improvement

ABBREVIATION: ACGME, Accreditation Council for Graduate Medical Education

initiative encourages and educates participants on the importance of a balanced lifestyle emphasizing exercise, nutrition, teamwork, and mental health.¹⁹ We present prospectively collected pre- and postintervention metrics to assess its impact in promoting good mental health hygiene.

METHODS

Wellness Initiative

The program, coined “La Sierra” in homage to the famed California high school that promoted physical education decades ago, was implemented in July 2015 and offered to all residents of the Department of Neurosurgery of the Medical University of South Carolina (no institutional review board approval was required for this quality improvement initiative). The full protocol is detailed in another report¹⁹ and encourages and educates participants in the importance of regular exercise, balanced nutrition, stress management, and sleep hygiene. In brief, all participants underwent baseline psychological and sleepiness testing which was then repeated at the conclusion of the pilot year. Biweekly wellness lectures on exercise, diet, alcohol avoidance, and mental health were incorporated into the resident education curriculum. One-hour-long, team-based exercise sessions combining strength and endurance training under the guidance of physical trainers were incorporated into the workweek. Lastly, additional independent activity was promoted such as running, cycling, squash, and team sports.

Psychological and Sleep Disorder Assessments

Previously validated psychological instruments were administered to participants in private and collected in a confidential manner during the first month of program implementation (July 2015). To assess baseline depression, anxiety, and quality of life, the 8-item Personal Health Questionnaire Depression Scale,²⁰ Generalized Anxiety Disorder 7-Item Scale,²¹ and Quality of Life Scale^{22,23} were administered. The Epworth Sleepiness Scale²⁴ was administered to assess baseline sleep deprivation. Identical instruments were then repeated at the end of the academic year (June 2016) to assess the effect of the wellness program on these factors.

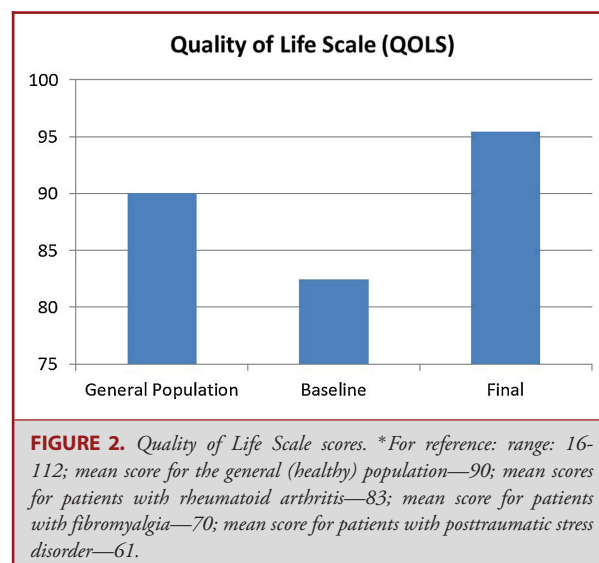
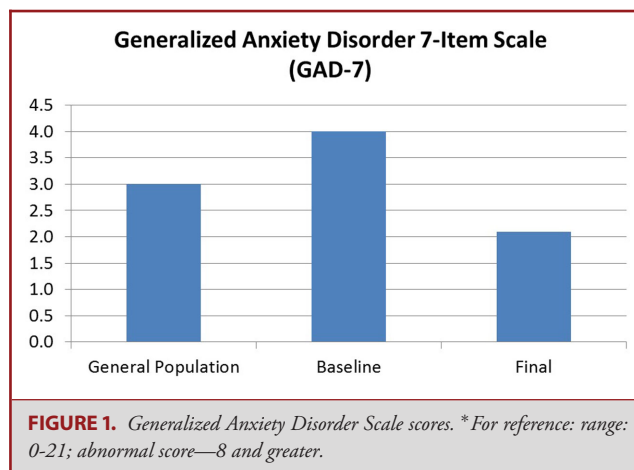
Data Analysis

Paired 1-tail *t*-tests were performed on the baseline sample and final sample with the hypothesis that the La Sierra wellness program would improve psychological well-being, anxiety, quality of life, and sleepiness scores.

RESULTS

Psychological and Sleep Disorder Assessments

Participants experienced improvements in psychological assessments of generalized anxiety and quality of life from baseline to final assessment. Generalized Anxiety Disorder 7-Item scale demonstrated significant improvement with scores decreasing from 4 to 2.1 ($P = .039$; Figure 1). Quality of Life Scale demonstrated significant improvement of scores ($P = .007$) and a lower percentage of participants with scores below the general public



average, improving from 77.8% to 33.3% (Figure 2). According to data obtained through the Personal Health Questionnaire Depression Scale instruments, there was no significant change in the degree of depressive symptoms at baseline and after a year in the wellness program (Figure 3). Epworth Sleepiness Scale demonstrated significant improvement of sleepiness scores ($P = .019$; Figure 4) and a lower percentage of participants with abnormal scores, improving from 33.3% to 10%.

Resident Perceptions

An anonymous survey was administered to assess resident's perceptions of the program on their mental health and the value and importance of the program for residents and the department. Responses to prompted questions in addition to free text comments are displayed in Figure 5.

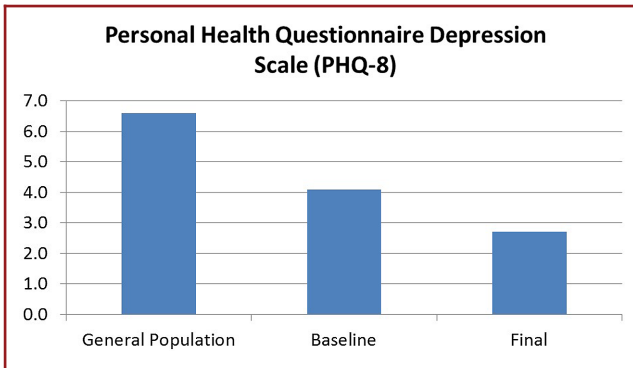


FIGURE 3. Personal Health Questionnaire Depression Scale scores. *For reference: range: 0-27; minimum depression—scores 1-4; mild depression—scores 5-9; moderate depression—scores 10-14; moderately severe depression—scores 15-19; severe depression—scores 20-27.

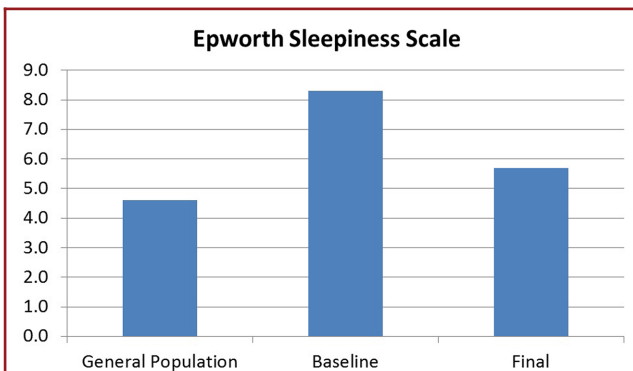


FIGURE 4. Epworth Sleepiness Scale scores. *For reference: range: 0-24; abnormal score—11 and greater.

DISCUSSION

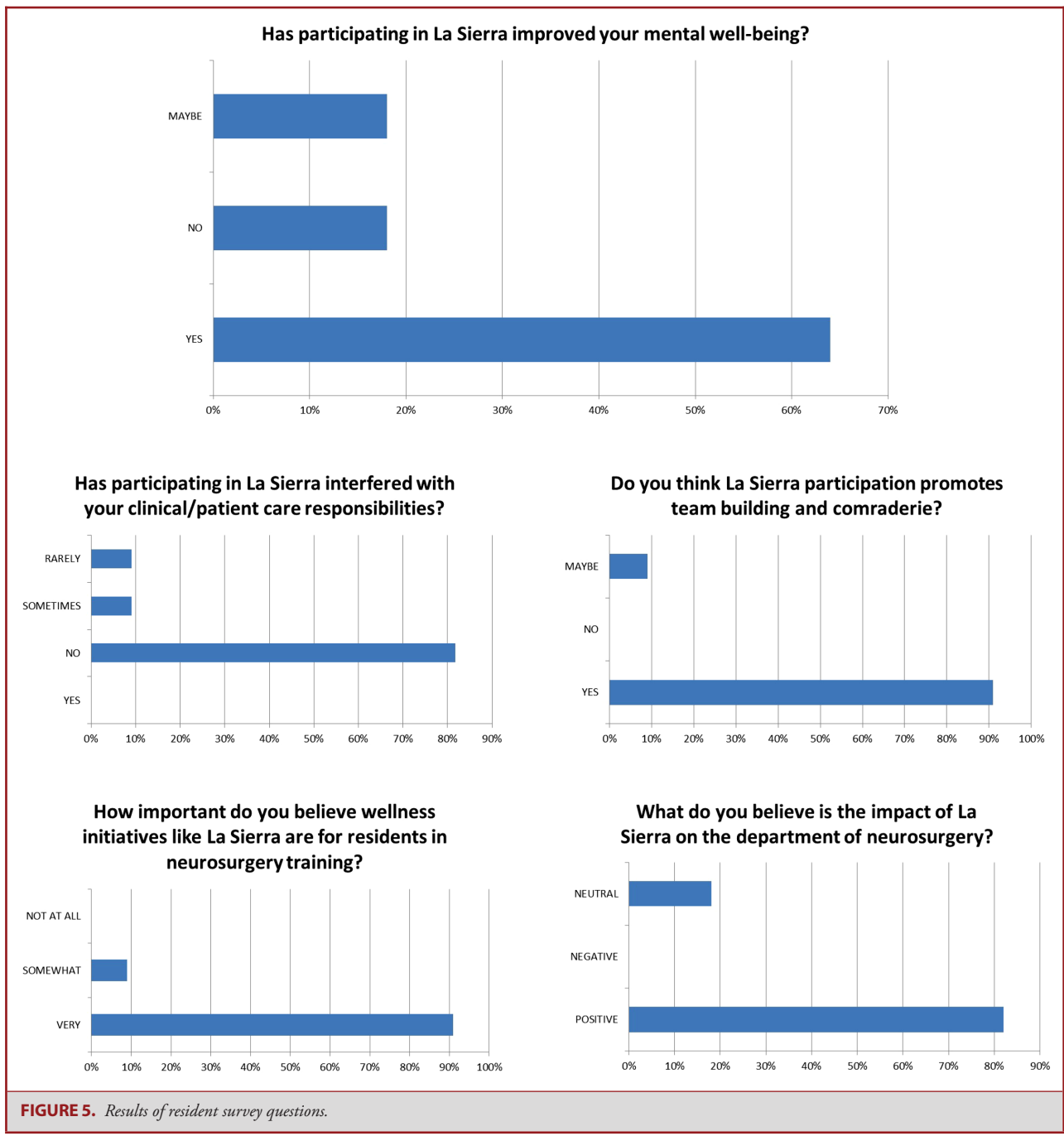
This single-department wellness initiative was designed to improve the physical and mental well-being of its participants by focusing on physical health, teamwork building, a balanced lifestyle, and healthier nutrition. In the baseline assessment of participants, a higher than anticipated prevalence of abnormal mental health conditions was discovered. In addition, sleep disorders were highly prevalent among participants.²⁵ At the completion of the pilot year of the wellness initiative, we have demonstrated improvements in the psychological well-being of the participants with significant improvements in the metrics measuring level of anxiety, quality of life, and sleepiness. For example, Quality of Life Scale scores range from 16 to 112, with the average general population score being 90.^{2,19} At baseline, the sample average score was 82.4, close to that of the mean quality-of-life scores of patients with rheumatoid arthritis (83). By the end of the study, the mean score was above that of the average population (95.4).

There has been little emphasis or education on physician wellness in organized medicine until very recently. There is now a realization that physician wellness may benefit not just the provider, but also the patient. This recent interest is reflected in the burgeoning implementation of “wellness” programs throughout medical institutions across the country. A “resiliency” program to help family medicine residents at risk for burnout has been described²⁶ as well as wellness initiative for psychiatry residents²⁷ and our own program in neurosurgery.²⁸ The ACGME Common Program Requirements were recently updated to address the widespread problem of burnout and depression among its trainees. As stated in the revised Section VI of the Common Program Requirements, “Self-care is an important component of professionalism; it is also a skill that must be learned and nurtured in the context of other aspects of residency training.” This acknowledgement goes a long way toward improving the well-being of physicians in training, a mission that we agree is mission critical and validates our wellness initiative which was begun prior to this mandate.

The psychological consequences of work-related stress are becoming well established. Burnout, a term used to describe feelings of emotional exhaustion, low self-accomplishment, and depersonalization associated with the work environment, is gaining ground as an important marker for resident well-being. In some instances, burnout leads to physicians quitting or changing specialties. For example, in the specialty of general surgery, 1 in every 5 residents fail to complete residency training^{29,30} and in neurosurgery, attrition rates approach 15%.³¹

These results give further evidence to the growing movement in education that physical health and mental health are intimately linked with each other. The wellness program fostered camaraderie and physical fitness, which appears to have had a positive impact on mental health metrics. In addition, the majority of participants reported the program exerted a positive influence on their own physical and mental well-being. The overall sentiment for the program was positive, with most participants believing it had improved their mental health and was a positive addition to their training.

Although there were certainly barriers to establishing this program, we believe such a program is feasible at most institutions. There was initially a resistance among some attending physicians that the program would interfere with performance of clinical duties. This trepidation was surmounted by support from the department chair and program director. In the end of the pilot year surveys, the responses suggested the program did not significantly interfere with clinical duties or efficiency. Another challenge was covering program expenses. Physical trainers worked at a highly reduced rate for the weekly sessions and other specialists such as nutritionists volunteered their time because of their belief in the importance of the program. Several alternative strategies include working with physical trainers on a less frequent basis and appointing fitness attending/resident leaders to lead the sessions in the interim or negotiating with



hospital administration for funding given the utility of such a program in reducing personal health costs.

Limitations

There are inherent limitations to this study. The most important is lack of a control group limits the interpretation of the results. The sample size was small and the participants

may not be representative of the general medical resident pool, although is largely representative of most neurosurgery programs. Currently, we have a very diverse group of residents. There is a concern that we may render our program less diverse over time from self-selection bias since we now feature this aspect of our training program during the recruitment process. We may now select for those who already have an interest in this

type of activity, so we will monitor this very closely. This may limit the generalizability of the study. However, we believe that the need for a culture that promotes well-being in postgraduate medical education is universal though the approach may need to be modified depending on the environment and individuals involved. The instruments used to assess psychological well-being were chosen because they are validated, popular, and short questionnaires but other instruments may potentially be better at capturing these data in the future. Additionally, resident questionnaire and survey answers may be subject to response bias, most specifically acquiescence bias. In the future, it will be important to address these concerns with larger sample sizes and more departments and institutions.

While the sample of physicians is small and in a specialty characterized by high stress, we believe the results are generalizable. Given the significant percentage of resident physicians with symptoms of burnout, it is likely that similar patterns may be seen in other specialties, both surgical and medical. The present study suggests that voluntary wellness programs that provide psychological benefits to their participants may be helpful in improving physician happiness and satisfaction. This, in turn, may improve patient care by resisting burnout and depression, and help to produce resilient resident physicians who will be better prepared to lead long, fulfilling, and productive careers. We believe the La Sierra program may therefore have universal benefits in residency training programs and may serve as a template for other programs interested in enhancing physician wellness.

CONCLUSION

We have successfully implemented a voluntary wellness initiative within our residency program to promote resident physician well-being. Baseline psychological screenings demonstrated alarmingly prevalent abnormalities in mental health status. At 1 yr, improvements were achieved in anxiety, quality of life, and sleepiness. Initiatives such as this may serve as a model to other residency programs as a method to promote general wellness and prevent burnout among trainees.

Disclosures

The authors have the following conflicts of interest: Spiotta- Penumbra Consulting, Honorarium, Speaker Bureau; Pulsar Vascular Consulting, Honorarium, Speaker Bureau; Microvention Consulting, Honorarium, Speaker Bureau, Research; Stryker Consulting, Honorarium, Speaker Bureau. Turner-Codman Consulting, Honorarium, Speaker Bureau, Research Funding; Covidien Consulting, Honorarium, Speaker Bureau; Penumbra Consulting, Honorarium, Speaker Bureau, Research Grants; Microvention Consulting, Honorarium, Speaker Bureau, Research Grants; Blockade Stock, Consulting, Honorarium, Speaker Bureau; Pulsar Vascular Stock, Consulting, Honorarium, Speaker Bureau, Research; Medtronic Consulting, Honorarium, Speaker Bureau. The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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COMMENT

The topic of wellness, particularly regarding residents, has become quite popular in recent years and for good reason. Burnout is a real and increasing problem facing residents and staff physicians alike and it appears to be worsening.¹

This article continues this important discussion and provides quantifiable data regarding both the impact and perception of a prescribed program of wellness. Tension has always existed between doing things the way they have always been done and more humane ways of training neurosurgeons. This dichotomy is played out against a background of broad changes in medicine: shorter hospital stays, higher inpatient censuses, more complex patients, more time spent in front of the computer instead of with patients, and advanced multidisciplinary teams. A critique of this focus on wellbeing is that it may detract from traditional learning/apprenticeship training and may ignore the real demands of neurosurgical patients with critical illnesses at any time of the day or night. This concern could be addressed by a long-term examination of the residents that participated in the wellness program and compared their results (complications, infections, research, publications, fellowships) to their peers that did not participate. There is clear evidence that when a surgeon performs poorly, his or her patients suffer.²

The data appears to be clearly demonstrating an improvement for the participants in the program in anxiety, sleepiness, and overall quality of life. These typical rigors of basic and clinical research still need to be

applied to this study. While facets of this work have been published before, we would encourage the authors to include statements about the methods they used to ensure anonymity for the participants in the study (such as an unbiased third party to distribute and collect the surveys). The study has a small sample population (8 residents) and there is no control group, just a comparison to the general population. The interpretation of the data seems appropriate. Based on the figures and the results discussed, the program seems to have had a positive impact of the participants. A comparison of the results of this study and other physician burnout initiatives would provide a realm in how to view the effectiveness of the change induced by this program.³ One critique would be that this paper does not include a control arm. I think these concerns ignore practical needs to improve all physicians' well-being. The links between performance and patient outcomes are clear. A control group for this work seems irresponsible and impractical. Comparing different approaches to optimize these kinds of programs would be valuable.

The results of this study and their interpretation will likely be tested at other institutions. So, a discussion about creating a standardized curriculum and obstacles to a program such as this would be helpful. This neurosurgery program is uniquely positioned to be not only a thought leader in neurosurgical resident wellness but also a potential clearing-house/repository for outcomes data in wellness programs. We would love to see long-term data for it would be very interested to note if these results were durable and how long lasting the changes in anxiety and sleepiness were. One of statements made in the introduction of this article is that physician burnout is a known contributor to suboptimal care. There is a dual goal of this work: improve ourselves so we may improve our patients' care. Given the most recent update of the ACGME common program requirements, each program will need to demonstrate how we are following this program's example.

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