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Yoga-based and Mindfulness Interventions in Medical Education: A Preliminary Review of Literature to Support Integration into the Formal Curriculum

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Abstract: Medical students are subjected to a great amount of stress, arising from heavy academic and clinical training workload. They are generally left to themselves to deal with stress. This chronic stress exposure results in burnout and fatigue, and impacts on patient care if this continues through their residency training. In recent years, mindfulness practices, such as yoga and mindfulness meditation, have shown promise as low-cost approaches to stress reduction as well as adjuvant therapy for patients suffering from chronic, lifestyle related diseases. The successes in the field of complementary health care, combining mindfulness practices with western medicine, have encouraged pioneers in medical education to adopt similar practices as interventions for stress reduction for medical students, alongside similar initiatives in many K-12 schools in the United States. (1) **Objective:** To review yoga-based and mindfulness interventions in medical education aimed to help medical students deal with stress, prevent burnout and fatigue, and improve learning outcomes. (2) **Method:** Review selected free full-text articles in pubmed.com and selected database collections through EBSCON. (3) **Key Results:** Yoga and mindfulness meditation, as shown in programs associated with mindfulness-based stress reduction pioneered by Jon Kabat Zinn, and similar variants, show promise in empowering medical students to address stress as part of pro-active self-care measures, to prevent burnout and fatigue, and produce more compassionate future doctors who are able to deal with their own suffering. (4) **Conclusion and Recommendation:** Programs incorporated into the medical curriculum introducing mindfulness meditation and yoga, and similar variants, provide worthwhile skills which students on a voluntary basis can choose to be equipped with to deal with stress. A simple mindful yoga elective is proposed, to introduce elements of mindfulness meditation and other skills to help medical students overcome physical and psychological distress arising from a stressful, sedentary academic lifestyle.

Key Words: mindfulness meditation, mindful yoga, stress reduction, mindfulness-based stress reduction, medical students



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1. INTRODUCTION

The amount of academic stress endured by medical students has been the subject of numerous studies, including narrative (Dyrbye and Shanafelt, 2016) and systematic reviews (Dyrbye, Thomas and Shanafelt, 2006; Jafari et al, 2012; Hope and Henderson, 2014; Ishak et al, 2013). Dyrbye, Thomas and Shanafelt (2006) cited statistics that medical students demonstrated a higher prevalence of depression and anxiety than the general population. This concern is also reflected by a local Philippine study which showed that medical students had a lower level of mental health compared with their physical wellbeing (Domantay, 2014). According to a multischool 2009 study on US medical students, about 21 % had mild/ moderate to major depression (Goebert et al, 2009) .

To address these concerns, other authors have called for a mandatory physical exercise program at all levels in the 4-year curriculum to help combat mental health problems (Cisneros et al, 2015, Bitonte et al, 2014). An extensive countrywide US survey showed that medical students who exercised aerobically or did strength training, or both, lowered risk of burnout and improved quality of life (Dyrbye, Satele and Shanafelt, 2016).

In the past four decades, the mindfulness-based stress reduction (MBSR) program, started since the early 1980s by the University of Massachusetts School of Medicine, have shown promise as an approach to stress reduction as well as adjuvant therapy to patients suffering with chronic, lifestyle related diseases, with some of the earlier achievements documented in the Clinical Handbook of Mindfulness (Didonna, 2009; Springer).

Yoga studies seem to indicate that yoga-based interventions are most effective for symptom reduction in some chronic lifestyle related illnesses, as well as reduction of anxiety and depression (McCall et al, 2013). Yoga's therapeutic benefits for anxiety and depression is supported by other reviews (Uebelacker et al, 2010; Cramer et al, 2013). Yoga interventions also minimize cardio-vascular risks and metabolic syndrome (Chu et al, 2014; Wang, Xiong and Liu; 2013), helping to overcome effects of sedentary lifestyles.

The documented evidence in the field of complementary health care, combining yoga-based and mindfulness practices with western medicine,

have encouraged initiatives to adopt similar practices as interventions for stress reduction for medical students and faculty, alongside similar initiatives in many K-12 schools in the United States (Simbulan, 2016). The goal of this paper is to present a preliminary review of studies on yoga-based and mindfulness interventions for medical students and future physicians aimed at improving their physical and psychological wellbeing, to be able to prepare and develop practical programs for medical students in the Philippines.

2. METHODOLOGY

A preliminary search of full-text journal articles on yoga-based and mindfulness practices for medical students was done, using the online search engines of MEDLINE/pubmed.com and EBSCON discovery for the years covering 2000 to 2017. Only free full-text articles retrievable from the database were downloaded, and selected papers chosen for the preliminary review, which would be part of an ongoing systematic review. The preliminary results of such search, including a qualitative analysis of the promise of such studies, is briefly discussed in the following section.

3. RESULTS AND DISCUSSION

As reviewed by Simbulan (2016), around 29 medical schools in the Western hemisphere, mostly in the U.S., have started mindfulness-based programs for their students at different levels of integration into the curriculum.

For this paper, a preliminary manual selection of downloaded, full paper articles showed four general kinds of mindfulness- and yoga-based interventions for medical students : (1) programs patterned after the mindfulness-based stress reduction program (**MBSR, Table 1**) ; (2) programs patterned after the mind-body medicine skills program (**MBMS, Table 2**) ; (3) yoga- based classes including breathing exercises, postures, and meditation (**Table 3**) ; (4) use of online and electronic media (DVDs) aimed at medical students (**Table 4**). There are more studies on the MBSR and MBMS intervention models for medical students in the literature compared to the simpler, yoga-based class



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interventions and the more recent studies on online mind-body skills trainings.

Table 1. Some studies on interventions following the **Mindfulness-Based Stress Reduction (MBSR)** model pioneered by the Center for Mindfulness in Medicine, Healthcare and Society (<http://www.umassmed.edu/cfm/>) of the University of Massachusetts School of Medicine.

Authors	Remarks
Kuhlman et al., 2016	Germany: MediMind/5 weeks/ high dropout rate in this study
Aherne et al., 2016	USA: Optional program well received than compulsory, 7 weeks.
Phang et al., 2015	Malaysia: Mindful Gym/ 4 weeks
Phang et al., 2014	Malaysia: Mindful-S.T.O.P. , part of Mindful Gym (practical component)
Van Dijk et al., 2015	Netherlands: Those who signed up were in psychological distress.
De Vibe et al., 2013	Norway: gender specific effects of intervention; women benefited most.
Rosnzwieg et al., 2003	USA: effective stress management
Shapiro et al., 1998	USA: Seminal work on MBSR applied to medical students; showed promise for stress reduction
Dobkins et al., 2013	Review of MBSR interventions for medical students and healthcare professionals

Table 2. Some studies on programs using the **Mind-Body Medicine Skills (MBMS) Course** developed by the Center for Mind-Body Medicine, Washington, DC, USA. (<https://cmbm.org/about/>)

Authors	Remarks
Van Vilet et al., 2017	Dutch/Swedish: long term beneficial effects of the course
Chen et al., 2016	USA: 1 st year Med, depression score in intervention group did not rise significantly. (11 wks)
Kraemer et al., 2016	11 weeks: 1 st and 2 nd yr med. Students: Distress tolerance much better in intervention group
Greeson et al., 2015	Short version (4 weeks); A brief, 4-week model is feasible, acceptable, and effective for reducing stress, increasing mindfulness, and enhancing student self-care.

Gordon, 2014	Review of medical schools using MBM Skills Course
Bond et al., 2013	11-week Mind-body elective (Boston University)
MacLaughlin et al., 2011	11-week Mind-Body elective (Georgetown University)
Saunders et al., 2007	11-week Mind-Body elective (Georgetown University)

Table 3. Some studies on interventions using yoga - based classes as stress reduction for medical students (yoga with meditation, posture practice, breathing exercises).

Authors	Remarks
Prasad et al., 2016	Yoga and meditation 6 week intervention; biweekly hatha yoga class
Simard and Henry, 2009	16-week yoga intervention pilot study (biweekly, 1 hr yoga session)
Malathi and Damodaran, 1999	India: Yoga on exam-related stress: a significant decrease in the number of failures in the yoga group, with anxiety reduction after practice .
Bansal et al., 2013	The students reported improvement in general and mental well being following the intervention and difference was found to be highly significant. Question : Is posting in community medicine stressful ?

Table 4. Some studies on interventions using online and electronic media (DVDs) to introduce mindfulness for medical students and health professionals.

Authors	Remarks
Kar, et al., 2015	A randomized controlled study on a DVD-Delivered Mindfulness-Based Intervention for Stress Reduction in Medical Students
Kemper, 2017; Kemper et al., 2017; Kemper and Rao, 2016; Kemper & Khirallah, 2015; Kemper and Mahan, 2015	Focused on studies using online training in mind-body skills for medical students (1 study) and health care professionals (most of the studies by Kemper). The experience acquired here can be applied to interventions for medical students , alongside face-to-face mind-body skills training.



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4. CONCLUSIONS

Yoga-based and mindfulness interventions to improve the general psychological and physical wellbeing of medical students are increasingly become popular, as a way to reduce stress and anxiety levels, and depression, and prevent burnout, which can impact on their future professional lives as physicians. The common element in these interventions have “mindfulness” – the practice of cultivating attention to the “here and now” – as a common property, recognized now with extensive studies on its neurobiological mechanisms, psychological benefits and clinical applications (Guendelman, 2017). A mind-body medicine course which combines the strengths of the MBSR, MBMS and yoga-based classes can be developed, including availability of online and electronic media to facilitate individual and group learning and practice. Depending on the available training resources, online mind-body training can be done initially for medical students and faculty, complemented with simpler interventions such as introducing them to yoga classes, where they learn the basic elements and practices of mindfulness. The more expensive MBSR or MBMS programs may evolve later with proper training of academic personnel elsewhere.

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