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Yoga Intervention Benefits and School Setting Applications

Capstone Project

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CERTIFICATE OF APPROVAL

CAPSTONE PROJECT

Yoga Intervention Benefits and School Setting Applications

This is to certify that the Capstone Project of

Jessica Olson

Has been approved by the faculty advisor and the CE 695 – Capstone Project

Course Instructor in partial fulfillment of the requirements for the

Master of Science Degree in

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Abstract

Early life stress is associated with a higher risk of both mental and physical health issues over the lifespan. Stress, mental, and physical conditions all interact to impact the overall wellbeing of children. Yoga is a promising tool to help with the holistic wellbeing of both children and adults. Yoga practice, including meditation and breathing exercises, has been shown to positively impact both children and adults in various facets of mental and physical health, and to decrease physiological and perceived stress. Introducing yoga early, and in a school setting, may be an impactful way to reach many children and make a long-term impact on their well-being throughout their lives. Specifically, if yoga skills are taught to children at a young age, it has the potential to be used as a coping skill throughout life, including challenges in adulthood. Various school setting applications will be discussed in this literature review, as well as needs for further research.

Table of Contents

Introduction5

Review of Literature6

 Stress Defined.....6

 Effects of Stress..... .6

 Interventions to Reduce Stress.....7

 Yoga Defined.....8

 Types of Yoga.....8

 Yoga Benefits in General Population.....11

 Yoga Benefits in Youth and Adolescents.....19

 Yoga in Schools.....21

Future Research Needs.....24

Additional Considerations.....25

Implications in School Counseling Programming.....26

Conclusion27

References28

Author’s Note41

Yoga Intervention Benefits and School Setting Applications

Recently, higher levels of stress and anxiety than ever before are being reported, and at younger ages (Twenge, 2015). Both mental and physical health issues over the lifespan are associated with stress in early life (Danese & McEwen, 2012; Ehlert, 2013). For example, adults who report four or more adverse childhood experiences (ACES), including but not limited to emotional, physical, or sexual abuse, are 4.6 times more likely to experience a depressed mood and are 12.2 times more likely to attempt suicide when compared to adults without any major adverse experiences in childhood (Hostinar et al.).

In response to the aforementioned concerns, it is important for counselors to utilize and investigate ways to help children cope with stress. Yoga has been shown to positively impact people on many levels and may be a tool that can be used to meet the needs of students in schools. Yoga is a practice which is growing in popularity in North America in the last decade and is a mind-body intervention including gentle stretching, breath control, and meditation (Ernst, 2006). Yoga is accessible to a wide variety of people, and modifications can easily be made to increase accessibility even further. Thus, the purpose of this literature review is to analyze the overall benefits of yoga through a review of the literature for consideration regarding benefits with children. A focus of this literature review will be research on yoga interventions in a school setting in particular, and discuss the impact yoga could have in a school environment. Finally, I will discuss recommendations for implementing yoga in a school setting, and considerations for the school counselor.

Literature Review

Stress Defined

Stress is defined as environmental demands exceeding a person's perceived ability to cope, which results in both behavioral and physiological changes (Cohen et al., 1997, as cited in Wynn & Holloway, 2019). Different types of stress have more recently been described including acute stressors, a short traumatic experience, for example, or chronic stress, such as those associated with long-term social problems like homelessness or relationship issues (Wynn & Holloway, 2019). Stress affects physical and mental health, as well as the ability to function and maintain and can lead to unhealthy methods of coping (Bukar, Eberhardt, & Davidson, 2019).

Effects of Stress

Stress is a substantial contributor to both mental and physical illness and can negatively impact psychological well-being (Schmidt, Sterlemann, & Müller, 2008; Yamawaki, Okada, Okamoto, & Liberzon, 2012). When people experience a high degree of chronic stress, they are more susceptible to serious illnesses such as depression, anxiety, Type-II diabetes mellitus, and cardiovascular disease (Schmidt et al.; Yamawaki et al.). In addition to the increased risk of depressed mood and suicide attempts as state above, adults who experienced four or more ACEs are 2.2 times more likely to develop coronary heart disease, 2.4 times more likely to have a stroke, and 1.6 times more likely to develop diabetes (Felitti et al., 1998, as cited in Hostinar et al., 2018).

Interaction of physical and mental symptoms. Despite stress being a significant contributor to both mental and physical illnesses, most research on stress in early life has focused on mental illness or physical illness, with the exclusion of the other (Hostinar et al., 2018). According to Hostinar et al., this is surprising because often the instances of health problems associated with early-life stress have high rates of comorbidity and share common risk factors

and etiological pathways. In 2016, Nusslock and Miller, developed the neuroimmune network hypothesis in an attempt to integrate the separate literatures. This hypothesis proposes that many of the health issues related to early-life stress arise because “adversity potentiates bidirectional crosstalk between the neural and immune systems, engendering a positive feedback circuit that links emotional processes, low-grade inflammation, and unhealthy behaviors” (Hostinar et al., p. 142). Inflammation is an area of interest as well that has interactions with both physical and mental health. Depression and inflammation are not always coupled together, but are more likely to cluster together in those individuals with ACES such as maltreatment (Danese et al., 2008; G. E. Miller & Cole, 2012).

Interventions to Reduce Stress

In an effort to reduce stress, at both the childhood and adult ages, many interventions have been researched. Both physical and mental interventions have had success in reducing stress. One research study found that physical activity interventions have a medium-term (3-12 months) anti-depressant effect on the body, as it is believed that improved physical fitness can reduce psycho-social stress responses (Krogh, Speyer, Gluud, & Nordentoft, 2015). Another study found mindfulness, specifically Mindfulness Based Stress Reduction (MBSR) to be superior to placebos in reducing anxiety (Goyal et al., 2014). Yoga is an interesting intervention to assess in that it is a form of both physical and mental exercise and incorporates techniques from both interventions.

Yoga Defined

Yoga is both a philosophy and a way of living, with origins in Hindu spiritual traditions from India (Zoogman, Goldberg, Vousoura, Diamond, & Miller, 2019). Yoga, commonly known as a mind/body-approach, is a traditional practice which unites the mind, body, and spirit using

various techniques, including physical poses, breath work, meditation, and chanting (Cramer, Lauche, Langhorst, & Dobos, 2013). Asanas are physical poses or postures that a person may hold for a number of breaths (Nguyen-Feng, et al., 2019). Breath work includes a variety of techniques in which practitioners can manipulate or notice their breath, increasing the rate or rhythm, or slowing the breath (Nguyen-Feng et al., 2019). Meditation practices vary, but include observing one's thoughts, and may be accompanied by chanting or physical movements (Nguyen-Feng et al., 2019).

Types of Yoga

There are a variety of types of yoga, and they vary in the techniques they use. Most types of Western yoga are derived from or are under the umbrella of hatha yoga. Hatha yoga includes physical postures, breathing practices, and meditation (Iyengar, 1966, as cited in Zoogman et al., 2019). Types of yoga influenced by hatha yoga are: Anusara Yoga, Ashtanga Vinyasa Yoga, Bikram Yoga, Integral Yoga, Iyengar Yoga, Jivamukti Yoga, Kundalini Yoga, Kripalu Yoga, Kriya Yoga, Sivananda Yoga and Viniyoga. It is important to note which type(s) would be most beneficial for each issue of the population and the age level, and which might best fit a school setting. Several types of yoga that may be applicable to a school setting include Yin Yoga, Yoga Nidra, Vinyasa Flow, and Trauma Informed Yoga.

Vinyasa Yoga. Vinyasa yoga stems from hatha yoga, but can be more rigorous, and emphasizes the combination of specific poses with breathing (Lutz, 2019). Vinyasa yoga often follows one breath with one movement, inhaling as one reaches one direction, and exhaling as one moves back.

Yin Yoga. Another form of yoga derived from hatha yoga is yin yoga. Yin yoga is a calmer, more meditative form of yoga which uses seated and lying postures that are held for

three to five minutes, while maintaining deep breathing (Grilley, 2002). Yin yoga can be a tool for relaxation and coping with stress because of its focus on calmness and mindfulness, which can improve psychological health (Hylander, Johansson, Daukantaite, Ruggeri, 2017).

Yoga nidra. According to Anderson, Mammen, Paul, Pletch, and Pulia (2017), yoga nidra is a relaxation and meditation technique designed to introduce and develop physical, emotional, and mental relaxation. The definition of yoga nidra has become confusing and diluted, making testing and comparison difficult (Parker, Bharati, & Fernandez, 2013).

According to Parker et al., the current definition has become more closely linked to relaxation, while the traditional practice was based on literature and accounts for empirically measurable, physiological markers that distinguish it from other states of relaxation. Brain function measured in physiological studies, particularly measuring electroencephalography (EEG) and positron emission tomography (PET) may support an assertion by Swami Rama of the Himalayas; “all of the body is in the mind, but all of the mind is not in the body” (Rama, 2002, p.58, as cited in Parker et al.). Parker et al. propose using a definition from Bharati using four levels of yoga nidra practice, which would provide a measurable physiological hypothesis for investigation. Yoga-nidra, yoga sleep, is a state in which an individual displays symptoms of deep, non-REM sleep, including delta brain waves, while simultaneously remaining fully conscious (Parker et al.). According to Parker et al., what is commonly now thought of as yoga nidra, including guided imagery and relaxation, is one of the precursor stages to traditional yoga nidra. Results of literature related to yoga nidra are inconclusive, and some current studies are inconsistent with past studies (Parker et al.). Parker et al. recommend that research needs to be completed using the same measurements and techniques for yoga nidra to determine its actual effect on the body.

Trauma-informed. Trauma-informed yoga (TIY) is yoga that is adapted to meet the needs of individuals working to overcome trauma and may alleviate some symptoms by creating a safe space for practitioners to learn how to respond, rather than react, to symptoms and circumstances (Justice, Brems, & Ehlers, 2018). TIY is not a type of yoga specifically, but is a method to teach a yoga practice. Trauma-informed yoga practices include making the environment feel safe for those who may have experienced trauma, being mindful of physical touch and adjustments, and noticing environmental needs such as leaving the door open. Instructors speak in an inviting manner by employing phrases such as “I invite you to close your eyes” rather than “close your eyes.” This way of instruction helps individuals suffering from a traumatic event to feel that closing one’s eyes is a suggestion rather than something imposed upon them. Additionally, instructors may take a modified pose to make a difficult posture feel less intimidating for participants. These strategies are then utilized while practicing the various forms of yoga, such as yin yoga or vinyasa yoga. According to findings from Justice et al., TIY instructors need to emphasize beneficial practices such as diaphragmatic breath and restorative postures, consider sequences that overly engage the sympathetic nervous system, adapt to limitations and challenges for teaching in unconventional settings (i.e. prisons, VA hospitals, schools), and provide specialized training and preparation (i.e. TIY certifications, adaptations for student needs).

Yoga Benefits in General Population

There are many promising benefits to yoga that have been found in the following research pertaining to adult populations. There are many more research studies about yoga interventions and benefits when looking at adult populations. While some benefits in children have been studied, it is important to look at the benefits in adult populations as they may also be

generalizable to children. One of the main differences is the method of delivery for the yoga practice, as children need shorter periods of yoga, meditation, and breathwork to keep them engaged. According to Ferreira-Vorkapic, Feitoza, Marchioro, Simoes, Kozasa, and Telles (2015), yoga techniques require attention control, an executive function that is not fully developed in children and adolescents. Children's capacity to exercise attentional control increases as the frontal lobe develops, but their ability is much poorer than in adults (Ferreira-Vorkapic, et al.). Yoga has been found to improve attention in both adults and children, so yoga practices should be adapted to fit a child's attention level so they can benefit from the positive effects (Ferreira-Vorkapic, et al.). It will be important to expand this work in future research.

Physical Health Benefits of Yoga. Many benefits to physical health markers have been shown as a result of a yoga intervention or practice. These improvements include lower physiological and psychological risk factors associated with non-communicable diseases (NCD) such as heart disease and cancer (Daukantaitė, Tellhed, Maddux, Svensson, & Melander, 2018). Yin yoga, for example, may lower levels of perceived stress and anxiety, which in turn lowers risk factors for NCDs (Daukantaitė et al.). Yoga practice can decrease fatigue and cancer-related distress, and improve overall sleep quality and energy (Bower, Woolery, Sternlieb, & Garet, 2005). One study found that a five-week Yin yoga-based intervention had positive healthy effects, particularly with decreasing levels of vasoactive peptide adrenomedullin (ADM), a biomarker associated with NCD and premature mortality (Daukantaitė et al.). ADM is secreted from many organs and mediates vasodilation, angiogenesis, and growth modulation, and thus exerts both growth-promoting and growth inhibitory effects on cells (Kitamura, Kangawa, Kawamoto, Ichiki, Nakamura, Matsuo, et al., 1993; Iimuro, Shindo, Moriyama, Amaki, Niu, Takeda, et al., 2004; Hinson, Kapas, & Smith, 2000). Greater reductions of ADM levels, anxiety

and sleep problems were found in intervention groups when compared to the control group (Daukantaitė et al.). High levels of ADM are strongly associated with the development of serious NCDs and premature mortality in the general population, as well as with short-term mortality in acutely ill patients (Belting, Almgren, Majer, Hedblad, Struck, Wang et al., 2012; Melander, Newton-Cheh, Almgren, Hedblad, Berglund, Engstrom, et al.).

Physiologically, anxiety can be viewed as an overactivation of the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS; Faravelli et al., 2012; Hoehn-Sacric & McLeod, 1998; as cited in Zoogman et al., 2019). When these systems are activated, they release cortisol and catecholamine neurotransmitters, specifically dopamine, epinephrine, and norepinephrine (Takahashi, Ikeda, Ishikawa, Kitamura, Tsukasaki, Nakama, & Kameda, 2005). This is what activates the “fight or flight” response, including increased heart rate and blood pressure, and faster, shallower breathing (Reimold et al., 2011). Yoga may help shift from the activated SNS and HPA axis to the parasympathetic nervous system (PNS), and it also may help prevent it from being activated in the first place (Kiecolt-Glaser et al., 2010). Yoga has been shown to decrease cortisol levels (Vadiraja et al., 2009; West, Otte, Geher, Johnson, & Mohr, 2004) and also to decrease many outcomes of HPA and SNS activation such as blood pressure (Innes, Bourguignon, & Taylor, 2005) and heart rate (Satyapriya, Nagendra, Nagarathna, & Padmalatha, 2009). It is possible that the slow movements and deep and steady breathing contribute to this relaxation response (Benson, Beary, & Carol, 1974).

With regular practice, yogic breathing relaxation techniques can help participants alleviate stress-related medical conditions associated with substance abuse such as irritable bowel syndrome (Knight, Locke, Zinsmeister, Schleck, & Talley, 2015), asthma (Gibson, 2016), and, especially for females, cardiometabolic diseases like hypertension (Vidot, Arheart, Prado,

Bandstra, & Messiah, 2013). Overall, yoga, including breathing practices, has been shown to help alleviate symptoms associated with a wide variety of physical illnesses, and also is associated with better physical health markers.

Mental Health Benefits of Yoga. There are several benefits of yoga for mental health, including the ability to self-regulate attention, memory and emotion. In addition, yoga has also improved individuals' healing from stressful or traumatic events. Yoga has been a promising treatment option for depression, anxiety and substance use disorder. It is also important to note that there is overlap between the observed benefits of yoga over the mental and physical health areas, with sleep, for example. A discussion of each of these benefits is described in subsequent paragraphs.

Emotion Regulation. Monitoring and adjusting emotional responses to stimuli in the environment is called emotion regulation, and it is controlled by the autonomic nervous system, or ANS (Thayer & Lane, 2000). Greater emotion regulation aids in responding to a threatening or potentially stressful situation (Yamawaki et al., 2012). The parasympathetic nervous system (PNS) moderates and inhibits emotional responses, which down-regulates the activity of the SNS, and can change interactions between brain regions during situations requiring emotion regulation (Lane, McRae, Reiman, Chen, Ahern, & Thayer, 2009; Thayer, Ahs, Fredrikson, Sollers, & Wager, 2012). Heart rate variability (HRV) is influenced by a group of brain areas that regulate the activity of the heart through the vagus nerve and is a biomarker for emotion regulation (Thayer et al.). One study compared effects on HRV and fMRI of emotion regulation using a cross-sectional sample of yoga practitioners (YP) and physically active individuals not practicing yoga, recreational athletes (RA) (Wadden, Snow, Sande, Slawson, Waller, & Boyd, 2018). The goal was to determine whether YP participants' patterns of brain activation differed

from those of RA participants, when viewing emotionally arousing stimuli (Wadden et al.). Differences in brain activity patterns were found between groups during the emotion regulation video clips (Wadden et al.). The brain activity of YP's brain activation resembled that of expert meditators during emotional situations (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Taylor, Grant, Daneault, Scavone, Breton, Roffe-Vidal, Courtemanche, Lavarenne, & Beaugard, 2011). This evidence shows that yoga has an impact on brain activation.

Trauma. Yoga has been recently adapted into a trauma-informed practice (Nguyen-Feng, Clark, & Butler, 2019). According to Clark, Nguyn-Feng, and Butler (2019), the review of 12 empirical studies did not find strong evidence that yoga is an effective intervention for PTSD, depression, and anxiety symptoms following a traumatic life experience. There was a wide range of effect sizes, but researchers found that there was a high risk of bias and that further research is needed (Clark, Nguyn-Feng, & Butler, 2019) to make this determination.

Anxiety and Depression. Anxiety is a common condition that can be debilitating and can become chronic if left untreated (Zoogman et al., 2019). According to Zoogman's meta analysis, yoga practice had a large statistically significant effect on anxiety symptoms. The meta-analysis covered a wide range of participants, although few studies included a population that met diagnostic criteria for an anxiety disorder (Zoogman et al.). Zoogman et al.'s meta-analysis focused on anxiety symptoms in the general population instead of individuals with a diagnosed anxiety disorder, so it was not a major limitation. The other significant consideration across studies is that the largest effects, approximately twice the magnitude, were found in studies conducted in India (Zoogman et al.). They provide many possible reasons for this, which is discussed later in the cultural considerations portion of this paper.

In one Evidence-based practice (EBP) project conducted by Bukar, Eberhardt, and Davidson (2019), patients who participated in a yoga and meditation class reported improvement in anxiety symptoms after their first class. They also found reported sustainability after the first class versus the second class (Bukar et al.). Bukar et al. aimed to analyze the sustainability of a yoga intervention and also the utilization of yoga and meditation as new coping skills. There was a significant increase in the utilization of both yoga and meditation at discharge prior to admission in an inpatient setting (Bukar et al.).

In addition, yoga includes spiritual components which may relate to how yoga helps with anxiety (Zoogman, Goldberg, Vousoura, Diamond, and Miller, 2019). According to Zoogman et al., these concepts are impermanence and egolessness. Impermanence refers to the notion that change is a key aspect of life and is inevitable (Zoogman et al.). Change is always happening, whether it be within us or around us (Zoogman et al.). Impermanence relates to decreasing suffering (Zoogman et al.), which in turn may relate to decreasing a person's anxiety symptoms. According to Zoogman et al., the "gurus" recommend meditation on accepting the reality of impermanence, on how change is a fundamental part of life.

Egolessness is teaching lack of self (Zoogman et al., 2019). Yoga teaches that a person is more than their individual body, thoughts, feelings, sensations or history; they are a part of a larger creation, energy body or true self (Zoogman et al.). Yoga and meditation can be a process of discovery to understand through experience that we are not individual selves, but part of a universal connected self (Zoogman et al.). One reason that egolessness could reduce anxiety is that worry about how others perceive ones' self is taken away, since everyone is part of a larger being. Another reason could be that pressure is taken away to find one's self, and the importance of the self alone is diminished.

With over a third of the population meeting anxiety disorder diagnostic criteria at some point in their lifespan, (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Kessler, Ruscio, Shear, & Wittchen, 2010) more holistic interventions, such as yoga, may play an important role in improving well-being on a large scale. Anxiety, the most common mental disorder (Shiban, Schelhorn, Pauli, & Muhlberger, 2015), affects the quality of life and results in poorer health (Creed et al., 2002; de Beurs et al., 1999).

Yoga has been thought of as “mindfulness in motion” since it creates a similar cognitive-emotional state as mindfulness training (Salmon, Lush, Jablonski, & Sephton, 2009, p. 63). Many mindfulness treatments encourage bringing attention to the present moment in a non-judgemental way (Zoogman et al., 2019). Similarly, impermanence and egolessness may also encourage this mindful way (Zoogman et al.). Higher levels of dispositional mindfulness are associated with lower levels of psychological symptoms and increased well-being (Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Wash, Duggan, & Williams, 2008).

Mindfulness has also been shown to have a strong influence on cognitive processes which are commonly active in anxiety and depression (Zoogman et al., 2019). Mindfulness training can decrease repetitive negative thoughts, which has been shown to decrease psychological symptoms (Gu, Strauss, Bond, & Cavanagh, 2015). Mindfulness Based Stress Reduction (MBSR), the most studied mindfulness intervention, contains a yoga component in the curriculum (Kabat-Zinn, 1990). MBSR has moderate sized effects on anxiety (deVibe, Bjorndal, Tipton, Hammerstrom, & Kowalski, 2012). It is also superior to psychological placebos in reducing anxiety (Goyal et al., 2014). In practicing mindfulness, a person experiencing anxiety also exposes themselves to the anxiety experience, such as racing heart rate, catastrophic thoughts, and body tension, without reacting (Baer, 2003). The person sits with these sensations

and notices how they change (Kabat-Zinn, 1990). They become less identified with sensations and thoughts and recognizes that they are not a stable part of a personality (Hayes, Orsillo, & Roemer, 2010). Through yoga, it is possible that individuals are gaining exposure to unpleasant physical sensations and psychological states, perhaps at a greater degree through challenging physical postures (Iyengar, 1966, as cited in Zoogman et al., 2019).

In one meta-analysis, researchers found that yoga intervention, in a variety of styles, had a large effect size on anxiety measures relative to the control group (Zoogman et al., 2019). The benefits of yoga extended beyond anxiety symptoms and improved symptoms were found on non-anxiety mental health outcomes, physical health measures, stress, mental and physical health outcomes combined, life satisfaction, and depression (Zoogman et al.). Another study using a yin yoga intervention found decreased levels of both perceived stress and depression after a five-week intervention (Daukantaitė, 2018).

Substance Use Disorder. The majority of research focused on the meditation portion of yoga as a treatment for substance abuse. Meditation is promising as a part of a treatment for addiction (Lutz, Gipson, & Robinson, 2019). Yoga and meditation teach the individual to be in the moment without judging or reacting to the situation, and the use of this skill can help abusers separate themselves from a craving until it passes (Marlatt, 2002, as cited in Lutz et al., 2019). Meditation has been found to be effective at reducing alcohol, drug, and cigarette use in both heavy users and the general population (Alexander, Robinson, & Rainforth, 1994, as cited in Lutz et al., 2019). Since the effects lasted long term, meditation is found to prevent relapse (Lutz et al.).

Yoga has many uses in treating comorbid disorders with substance abuse. For example, prisoners who used a Buddhist mindfulness-based meditation practice showed significantly less

alcohol, marijuana, and cocaine use after release from jail when compared to the control group (Bowen, Witkiewitz, Dillworth, Chawla, Simpson, Ostafin, Marlatt, 2006).

Sleep. Similarly, yoga may improve sleep. One study of a randomized controlled trial show that a five-week Yin yoga-based intervention reduced the subjective experience of sleep problems and anxiety in highly stressed adults (Daukantaitė, 2018). There is a lack of research evidence in this area, but given the importance of adequate sleep, this is an area that could be further examined.

Yoga Benefits in Youth and Adolescents

Yoga can be used with children and adolescents, even those as young as 3 years of age. Although yoga has primarily been used with older children, possibly because of the assumption that children ages 3- 5 are too young to practice yoga, Stapp and Wolff (2019) found these assumptions to be false. According to Stapp and Wolff, four themes emerged during preschool age children's discussion of practicing yoga: (1) children's positive affect about yoga; (2) motivation and self-regulation skills; (3) children's knowledge of yoga, memory, and skill; (4) children's imagination, representation, and creativity (p.1402). Stapp and Wolff discuss seeing positive drawings with large smiling faces when children drew pictures of their yoga practice. Several children discussed that yoga helped them relax and stay calm (Stapp & Wolff). Children were able to recall and demonstrate yoga poses and the setup of the yoga classroom (Stapp & Wolff). Lastly, stories and imaginary experiences were part of the yoga lesson and helped children feel comfortable (Stapp & Wolff). This environment fostered creative thinking which is essential to children's development (Stapp & Wolff).

Self Regulation. Self-regulation skills include working memory, inhibition control, and attention (Strapp & Wolff, 2019). When children are able to regulate their behaviors and

feelings appropriately and can make good decisions about daily challenges, they are set on a path toward success in school and later life (Payton et al., 2008). Self-regulation skills also facilitate positive peer relationships, peer acceptance, and academic success (Raver, 2004).

Mindfulness-based yoga interventions which promote breathing, attention, focus, and behavioral aspects of wellness have emerged in multiple studies in elementary schools (Biegel & Brown, 2012; Napoli, Krech & Holley, 2005; Semple, Lee, Rosa, & Miller, 2009; as cited in Strapp & Wolff, 2019). Improvements in stress levels of fourth and fifth graders were found after a 12-week study of a school-based yoga program in an urban setting (Mendelson, Greenberg, Dariotis, Gould, Rhoades, & Leaf, 2010). Executive functions significantly improved in second and third graders after an eight-week mindfulness awareness program (Flook et al., 2010). A five-week study found similar results; yoga interventions led to positive results on attention and social skills of second and third graders (Biegel & Brown, 2012).

Thought Patterns. According to Mendelson, et al. (2010), urban 4th and 5th graders, both male and female, participated in a 45-minute mindfulness program 4 times per week for 12 weeks, consisting of breathing techniques, yoga-based physical activity, and guided mindfulness practices. Results showed lower levels of rumination, intrusive thoughts, emotional arousal, impulsive action, and psychologic arousal following the program.

Time on task, Planning and Depth Perception, and Body Image. Improvements in a variety of other tasks have been found following yoga interventions. Peck, Kehle, Bray, and Theodore (2005) found that children in grades 1-3 who showed attention problems in the classroom had a large effect size between pre and post scores of time on task. In Serwacki and Cook-Cottone's literature review (2012), they found studies showing improvements in planning and execution times, and depth perception. Clance, Mitchell, and Engelman (1980) found that

yoga and awareness training for a group of third grade African American youth with low body dissatisfaction and physical coordination reported decreases in dissatisfaction with the body parts and processes that they had disliked.

Yoga in Schools

Schools are an ideal setting to promote health and well-being of children (Serwacki & Cook-Cottone, 2012). One study found positive effects for typically developing children across various dimensions. Yoga program participation was associated with decreased body dissatisfaction, anxiety, and negative behavior as well as increased self-concept and emotional balance (Serwacki & Cook-Cottone). Reductions in cognitive disturbances, such as rumination and intrusive thoughts, and decreased physical and emotional arousal and impulsivity following a mindfulness intervention were found in inner city children (Serwacki & Cook-Cottone).

While the empirical evidence is generally supportive, Serwacki and Cook-Cottone (2012) state that the “utility of using yoga instruction in educational settings is inconclusive” (p. 106). Based on the extensive literature review of Serwacki and Cook-Cottone (2012), the effects of school-based yoga programs appear to be beneficial for the most part, but methodological limitations such as lack of randomization, small samples, limited intervention details, and statistical ambiguities interfere with the ability to derive definite conclusions and recommendations. A later literature review by Butzer, Bury, Telles, and Khalsa (2016) suggests that providing yoga within the school curriculum might be an effective way to help students with self-regulation, mind-body awareness and physical fitness. This in turn could further develop other social-emotional learning (SEL) competencies and positive student outcomes such as improved behaviors, mental state, health, and performance (Butzer et al.).

How it can be delivered. Based on yoga interventions in the research literature, yoga interventions were delivered in a variety of ways; however, a few key approaches were identified for a school setting specifically. Yoga can be delivered (a) in physical education class, (b) as part of after-school programs, (c) as mindfulness incorporated into daily routine, (d) in small group sessions during the school day, and (e) in residential treatment program school. The results of the corresponding studies suggest that it did not seem to matter how the intervention was delivered.

Even so, more research is needed on yoga interventions in schools. With the addition of high-quality school-based research, yoga could become a well-accepted part of school curriculum (Butzer et al., 2016). A possibility would be to integrate yoga and meditation with SEL programs at the individual, group, and school-wide level (Butzer et al.). Another way to incorporate yoga would be to hold 30-minute small group sessions, for 8-12 weeks, for example.

Considerations in school-based yoga. Behavioral management strategies, such as reinforcement, are commonly used in a classroom setting. It is important to note that some common strategies used may not be beneficial when teaching yoga. One study found that giving stickers may detract from the calming effects of yoga (Stapp & Wolff, 2019). With children ages 3-5, a sticker was given if they were good listeners, even though most children listened well and did not need a sticker (Stapp & Wolff). If a person has positive experiences with an exercise, they are more likely to engage in that activity later, but if they view it as a chore with a reward, they will be less likely to practice that activity when the reward has stopped (Higgins & Trope, 1990, as cited in Stapp & Wolff). Intrinsic motivation will be more likely to increase when the focus is on enjoyment of the activity (Higgins & Trope, 1990, as cited in Stapp & Wolff).

One other consideration is that much of the school-based yoga research has focused on elementary aged students (Serwacki & Cook-Cottone, 2012). One study by Butzer, Khalsa, Taylor, and van Over (2015) looked at the effects on grade point average (GPA) of a 12-week school-based yoga intervention during physical education (PE) class with 9th and 10th grade students. Participants were 95 high school students who had registered for PE, and the PE class sections were group randomized to receive either a yoga intervention or their regular PE class condition. The yoga intervention took place for the entire third quarter and half of the fourth quarter of the school year, and quarterly GPA was collected at the end of the school year. Results of their study indicated that there was a significant interaction between group and quarter, which suggests that GPA differed between the yoga and control groups over time. Post hoc tests showed that while both groups experienced a drop in GPA over time, the control group had a significantly greater decline from quarter 1 to quarter 3 than the yoga group (Butzer et al.). The decline in quarter 4, after the yoga intervention had ended, was equivalent in both groups (Butzer et al.). These results indicate that yoga may have a protective effect on academic performance; however, it may not persist when yoga practice is discontinued (Butzer et al.).

In two pilot studies by Ramadoss and Bose (2010), one in an urban school and one in a juvenile justice center, they found that a Yoga-based program can produce positive transformation in vulnerable youth. Long-term outcomes of a program, if widely implemented, range from reductions in juvenile crime, violence and high school dropout rates, to improvements in education, public health, economic growth and community development (Ramadoss & Bose).

Impact of Yoga in Schools. Yoga in school settings has been shown to benefit children and adolescents (Ferreira-Vorkapic, Feitoza, Marchioro, Simoes, Kozasa, & Telles, 2015). A

yoga program can help children with self-esteem, confidence, positive attitudes, mental health, concentration, and reducing stress and anxiety (Khalsa, Butzer, Shorter, Reinhardt, & Cope, 2015). Yoga and breathing exercises are a tool that can be used by students at any time during their day and are easily accessible as an emotional regulation tool.

Future research needs

In reviewing the existing research on yoga interventions, I found that there was not a lot of information or studies on how a yoga intervention interacts with other interventions. Based on the literature, there is a need to analyze the interaction of a yoga intervention with other interventions. In one study of a yin yoga intervention, it did discuss adding a psychoeducational component, and that this was beneficial (Daukantaitė, 2018).

One intervention that may be used in conjunction with yoga is medication. Yoga has been used as an alternative to medication as it has low adverse effects. There is also a trend toward the use of yoga as an alternative medicine intervention to improve specific physical and mental health conditions (Kaley-Isley, Peterson, Fischer, Peterson, 2010).

There are other areas which would also benefit from further research in the future. A larger sample size would be beneficial in research with preschool-age children. Stronger methodology in all children's yoga research is needed to further support for the benefits of yoga in the classroom. A study on any potential benefits in sleep for children would also be beneficial. Lastly, an analysis of the types of yoga instruction and how they can be used with different populations and ages would impact the utility of yoga as an intervention.

Additional Considerations

Social Justice. Yoga is promising in its effectiveness across cultures. Overall, yoga is viewed as a culturally sensitive intervention. One area to note is language in that prompts may

not be fully understood if language is a barrier. This would likely be satisfactory for physical poses since the student can view the instructor's pose, but it is possible that when including breathing, psychoeducational information, and meditation guidance, that some of the essence of the information delivered could be lost. One study did find that yoga interventions in India showed the largest effectiveness in improving anxiety symptoms (Zoogman et al., 2019). They hypothesized that this could be because yoga is viewed as an important cultural staple in India. Butzer, Bury, Telles, and Khalsa note that while yoga is a large part of wellness in India, there are no systematic surveys published regarding the prevalence of yoga in Indian schools, so it is difficult to analyze how many of them use yoga as a part of their standard curriculum.

One study conducted in a juvenile justice center with primarily male and female African American participants between the ages of 12 and 17 found that the yoga program may decrease perceived stress and increase self-control (Ramadoss & Bose, 2010). The changes that Ramadoss and Bose observed were small (less than 2 points on scales with a potential 40-point range), but statistically significant.

Financial barriers are important to consider with yoga. Although it may be done free during the school day, it still may be more appealing and accepted by students of a higher socioeconomic status because their family may practice and accept it more. Yoga accessibility in general is an important factor to consider.

Implications in School Counseling Programming

Yoga appears to be an effective anxiety intervention for both clinical and subclinical levels of anxiety symptoms (Zoogman et al., 2019). Yoga impacts an individual across many facets. According to Bukar (2019), regular yoga practice improves physical fitness, enhances

balance, flexibility, and strength, facilitates socialization, assists in regulating emotions, influences mood, and possibly helps improve personal relationships. School counselors can utilize yoga in a variety of ways as described below.

As a key leader in a school building, it is important that a school counselor is aware of the ways that yoga can be an effective intervention. School counselors can also recommend yoga as an extracurricular activity to students and their families. For example, they can look for local options for community members or school personnel to share opportunities for yoga participating through a school newsletter. They can also recommend this intervention to administration and use data and research to advocate for this method of helping students. School counselors can also get training in yoga and implement it as a part of their comprehensive school counseling program in classroom curriculum delivery, small group or individual counseling sessions. Lastly, the school counselor can recommend yoga to students and parents who are reluctant to use medication as an alternative intervention. According to Bukar, Eberhardt, and Davidson (2019), health care providers can “encourage patients to utilize non-pharmacological ways of coping to reduce stress and promote an overall sense of well-being” (p.376). Consistent yoga practice could lead to the decrease of utilizing benzodiazepines as the primary intervention for anxiety, which may help patients who are at risk for addiction (Bukar, et al.). It is noted that further research is needed on this notion (Bukar et al.).

Conclusion

In conclusion, yoga has many positive effects on people of all ages and continues to show promise as a holistic classroom intervention or with a targeted small group of students. With its high level of accessibility, yoga can be incorporated in a classroom setting or adapted to fit the age level, needs of students and the school environment. With yoga’s wide array of benefits

reported in adults, it is likely that more benefits in children would also be found with additional research. School counselors can play a crucial role in advocating for and recommending the use of yoga in the classroom as a method to help reduce childhood stress and in turn, reduce physical and mental issues throughout the lifespan.

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Author's note

The body of research for yoga's potential is substantial, but there is a strong call for methodological rigor in school-based yoga research (Butzer et al., 2015). Overall, use of school-based yoga interventions in the future is promising. As a school counseling intern, I have taught yoga to a seventh grade physical education class. One observation I have made during this time is that taking physical education time away from some kids may not be beneficial. Yoga may be a more beneficial intervention when added to a physical education class for some students because when they typically enjoy PE class, so they might not hold a positive outlook on missing that with yoga as a replacement. Other students, who do not enjoy physical education class, may benefit from yoga taking the place of their class. When considering the delivery method of yoga to students, I have found that a half hour session is appropriate for middle school students and that incorporating a mix of mindfulness/breathing, physical postures, and a game, keeps the students the most engaged. Although it is noted above that accessibility can be a barrier for yoga practice, yoga could also be a cost effective medical intervention if enough research is available to provide this as a recommended treatment. Yoga is an exciting treatment option to explore as a future school counselor as I believe it can help students develop positive coping skills and self-talk as they go through challenging times of growth.