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East meets west in psychiatry: Yoga as an adjunct therapy for management of anxiety

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ABSTRACT

Purpose: Provide yoga for coping and symptom management in a locked, adult inpatient psychiatric unit.
Design: Hatha yoga was offered to inpatients with mood disorders and/or psychosis 3 times per week in this evidence-based practice change project. Impact on sleep was examined using recorded sleep hours. Anxiety symptoms were assessed using 6 of the 7 symptoms recorded on the Generalized Anxiety Disorders (GAD) 7. Sustainability of benefits was examined. A self-assessment was conducted at discharge to determine acquisition of new coping skills.
Results: No difference in sleep hours or interruptions was noted. A statistically significant increase in the total anxiety scores ($z = -1.9815$, $p = 0.02385$) and sustainability of benefits ($z = -2.0894$, $p = 0.03662$) between the first and second yoga class were observed. A positive change from baseline in sustainability of symptoms for "less anxiety" ($k = 0.108$) and "more relaxed" ($k = 0.083$) was found. There was a significant increase in utilization of yoga ($p = 0.0015$) and meditation ($p = 0.013$) as coping mechanisms at discharge.
Conclusions: Adults in an acute inpatient psychiatric unit who participated in yoga practice identified yoga and meditation as newly-acquired coping mechanisms and reported significant improvement in anxiety symptoms with sustained benefits ranging from half day to full day.

Introduction

Yoga is a multicomponent practice that unifies the mind and body by linking breath to movement, remaining present in the moment while holding postures of variable difficulty. Although the mechanism of the effects of yoga in the body are not well understood, the use of yoga among young adults have doubled between 2002 and 2012 (Clarke, Black, Stussman, Barnes, & Nahin, 2015) while publications regarding the practice of yoga have tripled over the last decade (Jeter, Slutsky, Singh, & Khalsa, 2015). This uptake in the practice of yoga could indicate increasing recognition of yoga as an invaluable holistic intervention in clinical practice encompassing the mind, body, and spirit, particularly in the field of mental health. A meta-analysis published by Cramer, Lauche, Langhorst, and Dobos (2013), reported low to moderate level evidence of short-term decreases in anxiety and depression severity in this patient population. A systematic review performed by Jeter et al. (2015) identified consistently positive results for reduction in depression when yoga was used for any medical condition. Additionally, there has been growing evidence of the effects of yoga among patients with psychosis. Visceglia and Lewis (2011) conducted an 8-week yoga therapy program wherein yoga was shown to have an effect in alleviating positive and negative symptoms of schizophrenia, paranoia, activation, depression, general psychopathology, and improvements in perceived quality of life in both psychological and physical domains. They also pointed out that all elements of the Positive and Negative Syndrome Scale (PANSS) improved significantly (positive syndrome, negative syndrome, general psychopathology, anergia, activation, paranoid/belligerence, depression), except for thought disorder. This improvement in symptomatology aligns with the results demonstrated by Duraiswamy, Thirthalli, Nagendra, and Gangadhar (2007) and Muckherjee, Kumar, Singh, and Singh (2008), particularly when yoga is combined with traditional western medicine. Patients with schizophrenia showed improvements in quality of life, social and occupational functioning, discipline, adaptive functioning and symptoms. These studies underscore the importance of utilizing antipsychotic medication when indicated, along with other non-pharmacological interventions like yoga. Yoga has also been shown to improve physical fitness and energy level with any form of asana practice (Shapiro & Cline, 2004). This is especially important in Psychiatry since patients with mental illness are at a significantly higher risk of physical complications when psychotropic medications are coupled with unhealthy lifestyle behaviors (Stanton & Happell, 2014). The introduction of yoga may decrease this risk. Additionally, yoga has been demonstrated to work as a stress reduction agent during inpatient psychiatric admissions (Lavey et al., 2005), improve social functioning (Varambally et al., 2012), modulate immune responses during stress

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(Arora & Bhattacharjee, 2008), reduce unnecessary procedures and the number of hospital visits (Sober, 2000), making it a cost-effective complementary therapy in psychiatric treatment (Shapiro et al., 2007). The aim of this evidence-based practice (EBP) change project was to investigate the effects of yoga, as a holistic approach in symptom management, in addition to standard treatments currently offered in an acute, locked, 18-bed adult inpatient psychiatric unit.

Materials and methods

This project was excused from IRB oversight as a low risk evidence-based practice (EBP) change by the Institutional Review Board (# 160674QI). This project was determined EBP and not research because of the evidence supporting this practice in this patient population. When implementing best practices tested by others, outcomes are measured to assure that research translates into the unique culture of the organization as planned. Monitoring change is important for sustainability of the new practice. (Fineout-Overholt, Williamson, Gallagher-Ford, Melnyk, & Stillwell, 2011; Melnyk & Fineout-Overholt, 2011). Measures of success for this EBP change project were: sleep hours, sleep interruptions, symptoms of anxiety, duration of benefit, dose response, and addition of yoga as a coping strategy. In this three-month feasibility pilot project, patients voluntarily participated in a one-hour class, offered three times per week. The classes were taught by two registered nurses and a volunteer certified yoga instructor.

Sleep hours and number of sleep interruptions

Yoga's effect on sleep was investigated by calculating the hours of sleep obtained from the observation rounds conducted every 15 min, identifying where a patient is and what the patient is doing at a given point in time within a 24-h period. The sum of the sleep hours recorded on observation rounds was calculated, defining day time sleep as 0800 to 2100 and night time sleep as 2125 to 0745. The number of sleep interruptions during night time sleep were also counted to identify patients who were getting good quality sleep. The total hours of sleep and interruptions among participants and nonparticipants, before and after yoga practice were compared.

Symptoms of anxiety

The anxiety questionnaire (Table 1) is a "yes/no" retrospective self-assessment administered after yoga practice, asking patients about 6 validated symptoms of anxiety: whether they felt less anxious, less worried, more relaxed, less restless, less irritable, and less afraid (Spitzer, Kroenke, Williams, & Löwe, 2006). This assessment tool was constructed to have a total possible score of 6, reflecting improvement of all 6 symptoms. Though higher scores are better, any score over 0 reflects symptom improvement. Data analysis was performed on results obtained from patients who attended at least two classes during their hospital stay (average length of stay is 10.5 days).

Sustainability questionnaire

The sustainability of the benefits initially reported on the anxiety questionnaire was assessed 24 h after the yoga class to determine if benefits lasted for 1 h, half a day, or full day (Table 2). Additional option for "not applicable/no change" was included.

Table 1
Anxiety questionnaire.

After yoga…	N/A	Yes	No
I feel less nervous, anxious, or on edge			
I am less worried			
I am more relaxed			
I am less restless I can sit still			
I feel less annoyed/irritable			
I am less afraid something awful might happen			

Table 2
Sustainability questionnaire.

After yoga…	N/A	No change	1 Hr	Half day	Full day
I feel less nervous, anxious, or on edge					
I am less worried					
I am more relaxed					
I am less restless I can sit still					
I feel less annoyed/irritable					
I am less afraid something awful might happen					

Coping skills assessment

A coping skills assessment tool developed by these authors was administered at the time of discharge to ascertain if yoga and meditation were identified as newly-acquired coping skills in managing their symptoms (Table 3). A distractor (colonoscopy) was included to objectively eliminate patients who were too ill to answer the questions correctly.

Results

A total of 55 patients who attended at least one yoga class had the following diagnoses: mood disorders (n = 6), mood with psychotic features (n = 20), and psychosis (n = 29). Thirty of these patients attended at least 2 classes: mood (n = 3), mood with psychotic features (n = 10), and psychosis (n = 17).

Sleep hours and number of sleep interruptions

Yoga had no effect on sleep (Fig. 1). There was no statistically significant difference of paired comparisons in sleep hours (two tailed $p = 0.4246$, $t = 0.8118$, $df = 25$) or sleep interruptions (two-tailed $p = 0.1078$, $t = 1.6679$, $df = 25$) among participants (n = 26) before and after yoga practice. In addition, no statistically significant difference was found looking at the same parameters, sleep hours (two tailed $p = 0.3536$, $t = 0.9354$, $df = 57$) and sleep interruptions (two tailed $p = 0.5647$, $t = 0.5793$, $df = 57$), when comparing participants (n = 26) and nonparticipants (n = 33). The sleep hours were normalized and analyzed using unpaired *t*-test. The same process was utilized in comparing sleep interruptions between the participants and nonparticipants.

There was a slight increase in sleep hours ($\bar{x} = 8.2$ SD = 1.5 to $\bar{x} = 8.5$ SD = 1.6) and a slight decrease in the number of sleep interruptions ($\bar{x} = 1.7$ SD = 1.8 to $\bar{x} = 1.0$ SD = 0.7) before and after yoga class but the same trend was seen among the nonparticipants (sleep hours: $\bar{x} = 8.0$ SD = 2.2 to $\bar{x} = 8.6$ SD = 1.5 and sleep interruptions: $\bar{x} = 1.7$

Table 3
Coping skills assessment tool.

What helps you relax?	Admission	Discharge
Medication		
Deep breathing/meditation		
Exercise		
Talking to others		
Listening to music		
Reading		
Being alone in room		
Colonoscopy		
Yoga		

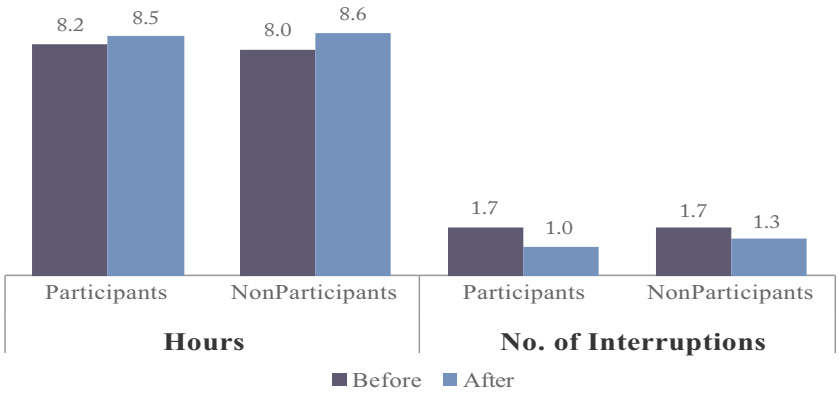

Fig. 1. Sleep hours and number of sleep interruptions before and after yoga class.
There was no statistically significant difference of paired comparisons in sleep hours (two tailed p = 0.4246, *t* = 0.8118, df = 25) or sleep interruptions (two-tailed p = 0.1078, *t* = 1.6679, df = 25) among participants (n = 26) before and after yoga practice using Paired and Unpaired *t*-test.

SD = 1.3 to $\bar{x}$ =1.3 SD = 1).

Anxiety assessment after first yoga class

Patients who participated in the yoga and meditation class reported improvement in symptoms of anxiety after their first yoga class (n = 55). The symptoms listed on questionnaire are shown on the x-axis (Fig. 2). The average % of participants reporting benefit was calculated accordingly and ranged from 47% of patients feeling "less afraid" to 76% feeling "more relaxed."

Total anxiety score: first yoga class versus second yoga class

The anxiety assessments of patients who participated in 2 yoga classes were compared

(n = 30), assigning "1" to symptoms where a patient answered "yes" and "0" for "no change or improvement." The sum of the symptoms (maximum score of 6) was calculated and averaged. The total anxiety score of the first and second yoga class were then compared and analyzed using Wilcoxon Signed Rank Test (Fig. 3). The results showed a statistically significant increase (z = −1.9815, two tailed p = 0.02) in the total anxiety score on their second class ($\bar{x}$ = 4.41 SD = 2.04) compared to their first class ($\bar{x}$ = 3.52 SD = 2.47). Sixty-five percent of patients reported a decrease in anxiety symptoms after their first class versus 91% after their second class.

Sustainability of benefits reported

Half of participants (n = 52) reported half day to full day benefit after the first yoga class for the symptoms "less anxiety," "less worry," and "more relaxed" (Fig. 4). Just under 50% reported feeling "less afraid" (43%) and feeling "less irritable" (49%). Several patients initially reported "no benefit" on the anxiety questionnaire but later reported benefit ranging from 1 h to full day on the sustainability questionnaire.

Reported sustainability: first class vs second class

The reported sustainability of the first class versus the second class were also compared and analyzed using Cohen's Kappa (n = 30). The y axis represents the first class while the x axis represents the second class (Fig. 5). In this assessment, a poor agreement is desired as it reflects a change from baseline. "Poor agreement" for symptoms of "less anxiety" (κ = 0.029, 95% CI -0.183 to 0.242) and "more relaxed" (κ = 0.083, 95% CI-0.129 to 0.294) were obtained indicating a positive statistically significant change between the classes. Additionally, when comparing the percent of participants reporting half day to full day benefit on the first class ($\bar{x}$ = 39.45% SD = 11.59%) versus the second class ($\bar{x}$ = 53.4% SD = 12.55%), a significant increase on the second class was noted (z = −2.0894, two tailed p = 0.03662) when the Wilcoxon Signed Rank Test was used (Fig. 3).

Coping skills assessment

There was a significant increase in the utilization of yoga (p = 0.0001) and meditation (p = 0.0002) at discharge versus prior to admission (n = 40) using McNemar's test of proportions (Fig. 6).

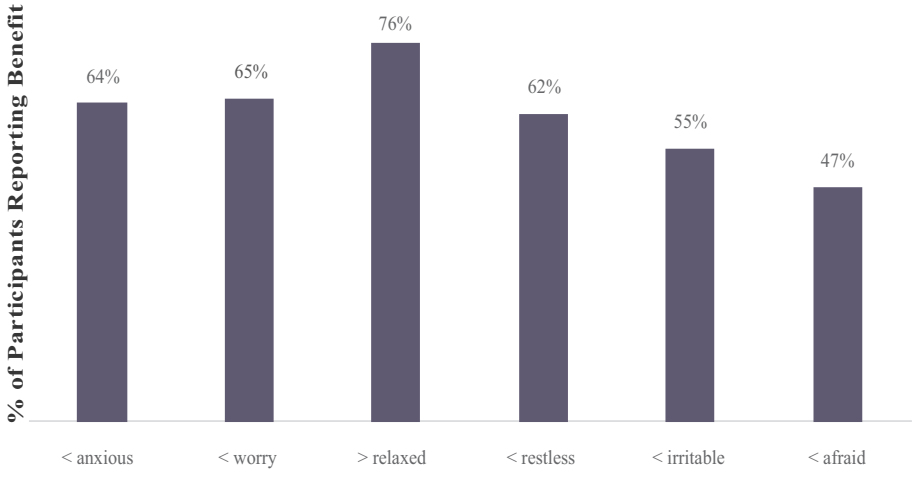

Fig. 2. Anxiety assessment after first class
Patients who participated in the yoga and meditation class reported improvement in anxiety after their 1st yoga class (n = 55).

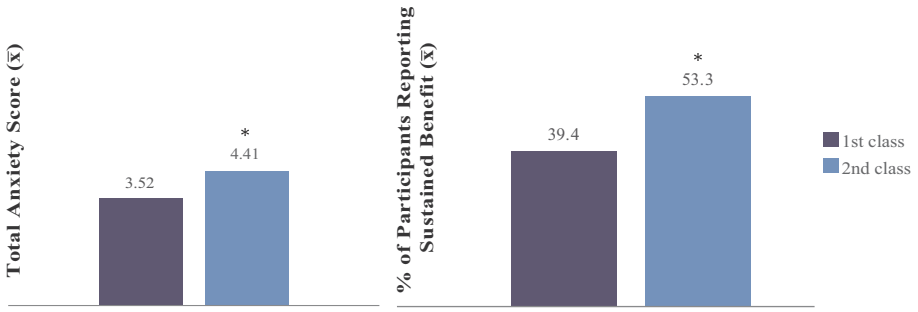

Fig. 3. Total anxiety score and sustainability: first yoga class versus second yoga class
There is a statistically significant increase ($z = -1.9815$, two tailed $p = 0.02$) in the total anxiety score ($n = 30$) on their 2nd class ($x = 4.41$ $SD = 2.04$) compared to their 1st class ($x = 3.52$ $SD = 2.47$) using Wilcoxon Signed Rank Test.

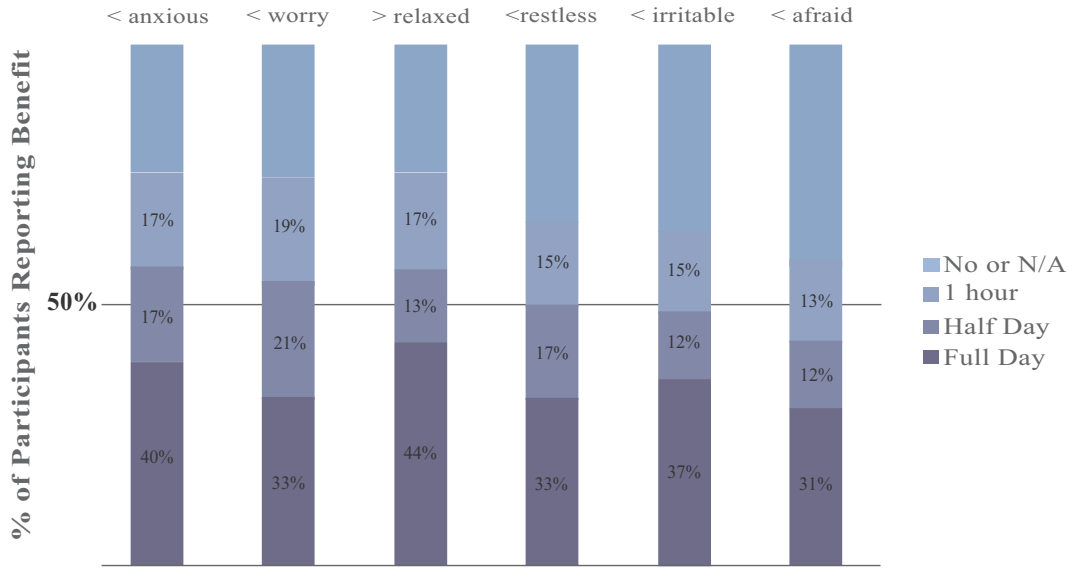

Fig. 4. Sustainability of reported benefits 24-hr after yoga class
Half of participants ($n = 52$) reported half day to full day benefit after the 1st yoga class for the symptoms less anxiety, less worry, and more relaxed.

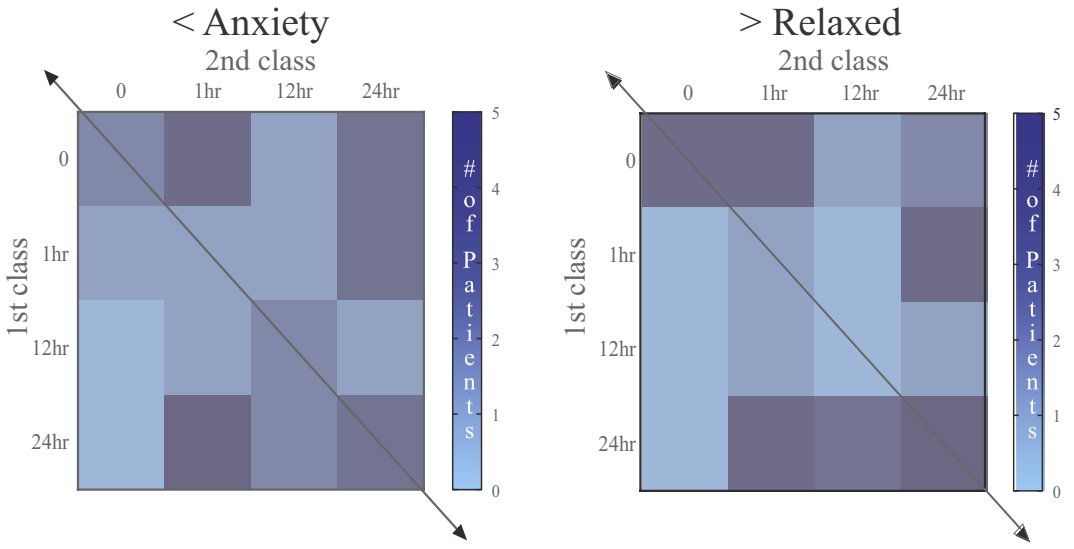

Fig. 5. Sustainability of reported benefits:
first class versus second class
"Poor agreement" for symptoms of "less anxiety" ($\kappa = 0.029$, 95% confidence interval from -0.183 to 0.242) and "more relaxed"($\kappa = 0.083$, 95% confidence interval from -0.129 to 0.294) were obtained indicating a positive change between the classes ($n = 30$) using Cohen's Kappa.

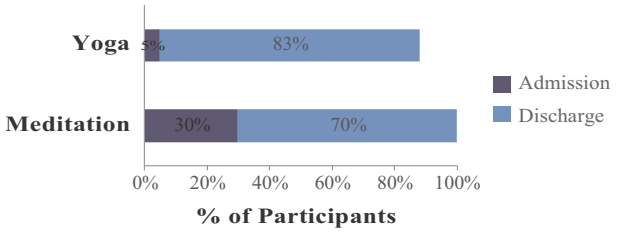

Fig. 6. Utilization of yoga and meditation as coping skills on admission versus prior to discharge
Significant increase in the utilization of yoga ($p = 0.0001$) and meditation ($p = 0.0002$) at discharge versus prior to admission ($n = 40$) using McNemar's test of proportions.

Discussion

The aim of this evidence-based change project was to provide patients a holistic approach to symptom management and to investigate the effects of yoga and meditation as an adjunct therapy to management of anxiety among patients with varying diagnoses in a locked, inpatient psychiatric setting. The benefits of yoga in decreasing anxiety have been widely reported (Vancampfort et al., 2011) but no reports to date have looked at the sustainability of benefits received, or the utilization of yoga and meditation as newly-acquired coping skills in an inpatient setting.

There was no improvement in night time sleep hours and interruptions among participants versus nonparticipants, before and after yoga class. This lack of improvement in sleep, although disappointing, is not surprising in an inpatient psychiatric setting. Rooms have multiple occupants, each with varying degrees of function. This could explain, in part, why there was no noticeable difference in sleep hours and interruption when comparing participants to nonparticipants. Furthermore, established protocols dictate the utilization of flash lights to perform nightly safety checks, which could disrupt sleep. It is also important to note that some patients have standing orders for sleep medication while others do not. In this pragmatic EBP change project, no treatment was changed because yoga was initiated. Consequently, sleep medications would have been administered if ordered routinely. Lastly, the inter-rater variability in recording sleep hours is a limitation of this project. These above-mentioned limitations could explain the inconsistency with what has been previously reported in a national survey where 55% of yoga users self-reported improved sleep (Stussman, Black, Barnes, Clarke, & Nahin, 2015).

Adults in an acute inpatient psychiatric unit who participated in yoga practice showed significant reduction in symptoms of anxiety after their first yoga class, ranging from 47% of patients feeling “less afraid” to 76% feeling “more relaxed” when looking at the 6 different symptoms. These results are consistent with published work on the alleviation of anxiety among yoga practitioners (Anderson, Mammen, Paul, Pletch, & Pulia, 2017). A significant increase in the total anxiety score was noted when comparing the first and the second class, suggesting a dose response to yoga in improving anxiety symptoms. The same trend is observed in sustainability of half day to full day benefits reported on the first class (39%) versus second class (54%), again suggesting dose response to yoga.

Forty-seven out of 121 questionnaires were initially filled out with “no benefit” on the anxiety questionnaire, but patients later reported benefit ranging from 1 h to full day on the sustainability questionnaire. It is unclear if these patients did not initially notice a change and later recognized a sustained benefit in anxiety symptoms over the course of the previous day. It is also possible that this discrepancy is simply due to patients' disorganization and could have been avoided if patients were interviewed instead of filling out questionnaires independently. However, this would incur a trade-off where the patients may be less forthcoming in providing authentic feedback. This interesting variance was realized during the data analysis when the patients in question had already been discharged. Moreover, the sustainability questionnaire was initially designed with the option of “no change” and “N/A” used interchangeably on some of the questionnaires. In hindsight, these options should have been differentiated. In effect, some patients checked “no change” for symptoms they did not have and would have otherwise been “N/A,” rendering the data less robust. As with the anxiety symptom questionnaire, the sustainability questionnaire would benefit from validation.

Patients identified yoga and meditation as coping skills they planned to utilize after discharge. Some patients did not participate during their hospitalization yet identified both as means to help manage their symptoms. The exact reason for this is unknown, but it is possible that these patients were positively influenced by the feedback from their peers.

Among this project's other limitations, the sample size was small, and because the project was quality improvement and not research, the intervention was not randomized. Therefore, there is no active or inactive control. Since providing patient assessment questionnaires both before and after yoga practice was deemed to be too cumbersome for this patient population, a retrospective pre-post assessment was utilized (Archibald, Trumpower, & MacDonald, 2014).

Patient Perspectives:

XXX [Blinded for review] serves many of the indigent population who otherwise would not have gained exposure to yoga and meditation. Their hospitalization provided a unique opportunity to explore the effects of yoga and meditation in alleviating their symptoms. Patients and their families have expressed positive feedback of the many benefits of yoga as part of their treatment. To follow we provide clinical vignettes regarding the response to implementing yoga into standard of practice.

A patient who had a history of assaultive behavior eagerly attended yoga, celebrating with hands up in the air every time he attended. Another patient constantly tormented by the voices he heard in his head described yoga as “the only time I get one hour of peace.” On one occasion, this patient had a notable increase in heart rate (110) and blood pressure (148/97) secondary to agitation prior to attending yoga. His vital signs were taken again after the yoga class and returned to baseline without the use of anxiolytics. Yoga was the only group activity he attended. A middle-aged woman diagnosed with Bipolar Disorder was admitted to the hospital restless, elevated, and pressured claimed she felt “less manic” every time she attended yoga. A mother, whose son suffered his first psychotic break and was introduced to yoga in the unit, saw yoga as an opportunity to reconnect with her son: “perhaps this is something we can do together as a family.” These are only a few of the stories of those whose lives were changed by the introduction of yoga. As further testimony to the success of the project, patients requested a referral list to locate yoga groups following discharge. A referral list for yoga practice in the general community was then prepared to be used in discharge planning and aftercare.

Conclusion

The results of this project show that yoga is an effective, adjunct therapy for management of anxiety, and benefits the patient as a whole. It is an essential tool that staff can offer, and patients can utilize in an inpatient psychiatric setting in symptom management. Given the positive program results, a contracted yoga instructor was hired at a salary of $50/h to continue providing yoga as standard of practice at XXX [Blinded for Review] NeuroBehavioral Medicine Unit, making yoga a cost-effective, holistic treatment modality that improves physical and mental well-being. The practice was also implemented at the Senior Behavioral Health Unit inpatient and outpatient due to the success of this project. It was not feasible to continue using on-duty nurses to perform the yoga classes after the conclusion of this EBP project. Yoga as an adjunct to traditional medical therapy was well-received, cost effective, and effective in reducing symptoms of anxiety in psychiatric

inpatients suffering from mood disorder and/or psychosis. This EBP project resulted in a sustainable change that is now a standard treatment offered in the inpatient psychiatric unit.

Implications for research and practice

Mental illness requires a holistic approach and nursing at its core is holistic (Cohen & Boni, 2018), taking into consideration the wholeness of the individual when providing care to attain higher degrees of satisfaction and improve patient outcomes (Cowling, 2018). As demonstrated in this project, a holistic modality such as yoga is an effective adjunct therapy to traditional treatment in inpatient psychiatry, addressing the physical, psychological, and spiritual needs of a patient to provide optimal care. Furthermore, yoga may appeal to patients who are reluctant to take medications, have incomplete success with psychopharmacologic interventions (Pitkanen, Hatonen, Kuosmanen, & Valimaki, 2009), and have refractory forms of schizophrenia (Pantelis & Lambert, 2003). As such yoga may fill a gap to adequately manage symptoms without resorting to polypharmacy. With the addition of yoga, which includes meditative practice, health care providers can encourage patients to utilize non-pharmacological ways of coping to reduce stress and promote an overall sense of well-being. Though not measured in this project, the consistent practice of yoga could lead to decreasing the utilization of benzodiazepines as the primary intervention for anxiety and agitation, which could in turn, inadvertently discourage benzodiazepene-seeking behaviors among patients who are already at risk for addiction. Future research is needed to explore this hypothesis.

Yoga benefits the person as a whole. Regular yoga practice improves physical fitness, facilitates socialization, enhances balance, flexibility, and strength, helps regulate emotions, influences mood, and potentially improves personal relationships. Future studies that look at the rate of recidivism with continued practice among patients who identified yoga as a coping skill for symptom management needs exploration. Additionally, a larger sample and a project design including administering sleep medications, only if needed, would be required to address whether yoga improved sleep or reduced reliance on sleep aids. It would be worthwhile to investigate if nightly meditation improves sleep. In this easily replicable project, we demonstrated that yoga is a feasible, cost-effective, sustainable, holistic modality which improves symptoms anxiety among inpatients with mood disorders with or without psychosis.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apnu.2019.04.007.

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