


The Impact of Adding Art Therapy to a Mindfulness Enhancement Training with a Medical Student

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Abstract

Healthcare professionals play an important role in the delivery of high-quality patient care. The medical students of today are the physicians of tomorrow, although medical student training is notably challenging. Increased rates of suicidal ideation and self-reported distress during medical school training have been identified in the literature. Mindfulness-based interventions have been explored with various populations, including medical students. Mindfulness-based art therapy interventions have also been found to be effective among various populations; however, no study has explored the impact of adding art to mindfulness enhancement training with medical students specifically. This is the first study to investigate the impact of adding art to mindfulness enhancement training with a medical student. Results from this study found mindfulness-based art therapy had a moderate effect on mindfulness scores. Mindfulness-based art therapy also demonstrated a slight, though not significant, increase in sense of coherence scores. Results indicated the medical student found mindfulness practice with art and without art equally helpful in promoting mindfulness. Materials identified as helpful in promoting mindfulness were chalk pastels, watercolor, graphite pencils, and tissue paper. Analysis of results

suggest mindfulness based-art therapy may be used to increase mindfulness and sense of coherence in medical students. Further research is necessary and this study presents implications for future research and practice in art therapy.

Keywords: art therapy, mindfulness, mindfulness-based art therapy, stress, medical student

Introduction

Uncertainty occludes the American health care system with proposed health care reform. Changes to health care have been met by sharp criticism from leading associations representing insurers, physicians, hospitals, and the elderly. The American Medical Association (2017) described proposed revisions to health care as "critically flawed" with potential to result in millions of uninsured Americans and dramatic cuts to Medicaid and other safety-net programs (p. 1). A recent review by the Congressional Budget Office (2017) suggested health care reform may result in a reduction of \$321 billion to federal deficits and an increase of 22 million uninsured Americans by 2026. Implications associated with the American health care system in a state of flux, coupled with the challenges of working within a managed care health system, add tension to an

already strained environment for today's physicians.

Medical students face increased rates of suicidal ideation and self-reported distress during training (Dyrbye et al., 2008; Dyrbye & Shanafelt, 2011; Greeson, Toohey, & Pearce, 2015). Mindfulness has been explored in numerous studies as a method to address these concerns (e.g., Dobie, Tucker, Ferrari, & Rogers, 2016; Greeson, Toohey, & Pearce, 2015; Slonim, Kienhuis, Benedetto, & Reece, 2015; Warnecke, Quinn, Ogden, Towle, & Nelson, 2011). The power of mindfulness lies within its application, which is broadly available for professionals and laypersons alike to discover and practice (Bishop et al., 2004; Brown & Ryan, 2003; Miller et al., 1995). Art is both applicable to and inherent within mindfulness (Rappaport, 2014). Combined, mindfulness and art therapy interventions have been studied in a variety of populations and have proven effective in subjective reports from participants as well as in neurological and physiological measurements (Ando & Ito, 2016; Kim & Ki, 2014; Monti et al., 2006). Further research is necessary to evaluate the impact of art making on mindfulness among medical students.

This study examines the impact of art making on mindfulness utilizing the principles of mindfulness based stress reduction and art therapy with medical students. When reviewing the scholarly literature related to art therapy and mindfulness, three themes emerged. The themes are: (1) inter-relatedness of the art therapy process and mindfulness, (2) populations exposed to art therapy and mindfulness, and (3) efficacy of mindfulness-based art therapy (MBAT) interventions. After the aforementioned themes are examined, the research questions will be detailed.

There are three essential aspects of mindfulness practice. First, mindfulness practice focuses on non-judgmental awareness of the present moment (Kabat-Zinn, 1994; Peterson, 2014). Second, a significant aspect of the practice of

mindfulness is attention to awareness through individual observation of body sensations, thoughts, and feeling tone (Kabat-Zinn, 1994; Peterson, 2014). Third, attitudinal foundations including "non-judging, trust, patience, non-striving, beginner's mind, acceptance, and letting be" are critical to mindfulness practice (Peterson, 2015, p. 79). In sum, attention to awareness in combination with these attitudinal foundations cultivate mindfulness. Art therapy both supports and interplays with these aspects of mindfulness.

The application of mindfulness to the arts is organic. Creating art is a kinesthetic and somatic event, offering an opportunity to practice non-judgmental attention to awareness while upholding the attitudinal foundations during the creative process. Rappaport (2014) identified mindfulness as "the process inherent within the arts" through "witnessing and immersion in the moment of the arts therapy experience" (p. 32.). Art therapy provides a fertile ground to practice mindfulness within the creative process. Given the essential features of mindfulness and the interconnection of mindfulness within the arts, numerous studies have explored the efficacy of mindfulness-based interventions with various populations.

The current body of literature exploring mindfulness practices in psychotherapy demonstrates utilizing this approach with clients yields positive outcomes (Brown, Marquis, & Guiffreda, 2013). Khoury et al.'s (2013) meta-analysis of mindfulness-based therapy (MBT), which included 209 studies and 12,145 participants with a variety of disorders, concluded that MBT was effective in reducing anxiety, depression, and stress. Hofmann et al.'s (2010) meta-analysis demonstrated improvements in depression and anxiety among populations with a variety of psychiatric and medical conditions, and found these positive effects were maintained through an average 27-week follow-up period. These meta-analytic reviews suggest that combining mindfulness-based practices with

psychotherapy may have a positive impact on the emotional health of clients experiencing a variety of psychological disorders and medical conditions. Remarkably, alleviation of distressing symptoms among clients is not limited to direct participation in MBT.

Clients benefit from therapists practicing mindfulness, even when clients are not aware of these practices. Grepmaier et al. (2007) found greater symptom reduction among clients working with therapists practicing meditation than those with therapists not practicing meditation. Khoury et al. (2013) observed therapists' experience with mindfulness-based practices impacted end of treatment clinical outcomes more than general clinical training substantiating earlier research by Pradhan et al. (2007). These studies suggest direct and indirect impacts of therapists' experience with mindfulness practice on clinical outcomes. When mindfulness practices are incorporated directly into psychotherapy, mindfulness-based stress reduction (MBSR) is one of the most widely used programs.

Mindfulness-based stress reduction (MBSR) is a standardized, multimodal group meditation program developed by Kabat-Zinn (1982, 1990) that has been used with diverse populations. Initially developed for individuals suffering from chronic pain, MBSR has since been applied as an intervention for individuals suffering from stress, emotional and psychological disorders, as well as individuals suffering from chronic medical diseases (Bolhmeijer, Prenger, Taal, & Cuijpers, 2009; Chiesa & Serretti, 2009; Grossman, Niemann, Schmidt, & Walach, 2004). Grossman, Niemann, Schmidt, and Walach's (2004) meta-analysis of the health benefits associated with MBSR found relatively strong effect sizes among very different populations suggesting MBSR has a positive impact on individuals coping with distress and disability from more serious medical disorders as well as in everyday life (p.39). MBSR's multi-model approach has proved effective in promoting positive

outcomes for various populations and is not limited to chronic conditions. MBSR with healthy people has also demonstrated positive outcomes.

Populations without clinical diagnoses or suffering from chronic medical conditions have been shown to benefit from participation in MBSR. Cheisa and Serretti's (2009) meta-analysis of MBSR with healthy people found significant positive, nonspecific effects on reducing stress levels among participants when compared with a waiting list. Irving, Dobkin, and Park's (2009) review of MBSR with health care professionals indicate participation in MBSR is beneficial for physicians in the domains of physical and mental health. These reviews suggest a broad range of populations that can benefit from MBSR. Mindfulness in combination with art therapy has also demonstrated positive outcomes among heterogeneous populations.

A wide variety of populations have been exposed to combined art therapy and mindfulness interventions. Ando and Ito (2016) investigated the impact of a mindfulness-based art therapy (MBAT) program with twenty Japanese college students. The effects of a creative art therapy program combined with walking and stretching meditation on adolescents suffering from depression and anxiety has also been explored (Kim & Ki, 2014; Kim, Kim, & Ki, 2014). The positive impacts of combining art therapy and mindfulness with adolescents and college student populations are demonstrated in these studies. Current literature indicates the efficacy of combining art therapy and mindfulness.

The efficacy of mindfulness combined with art therapy is important to research. Kim and Ki's (2014) study on the effect of creative art therapy with stretching and walking meditation found that this intervention provided improved emotional expression and decreased somatization in a neurasthenic adolescent. Kim, Kim, and Ki's (2014) study found significantly higher scores of subjective well-being among depressed and anxious adolescents

participating in an art therapy and breath meditation intervention. These studies suggest the combination of art therapy with mindfulness may promote emotional and physical wellness in adolescents. Further evidence for the effectiveness of mindfulness and art therapy interventions has been demonstrated through the collection of neurological responses.

Exciting current research explores the impact of mindfulness and art therapy on brain functioning among women diagnosed with breast cancer. Monti et al.'s (2012) study on the impact of an eight-week MBAT program with women diagnosed with breast cancer found significant increases in cerebral blood flow (CBF) in multiple brain areas during MBAT as indicated by functional magnetic resonance imaging (fMRI). Notably, Monti et al.'s (2012) study suggests subjects participating in MBAT had significant correlations between increased CBF in the left caudate and decreased SCL-90-R anxiety scores. Through fMRI scans, significant physiological and neurophysiological changes in response to an MBAT program have been demonstrated. Mindfulness and art therapy interventions have also been found to impact automated nervous system responses (ANS).

Further exploration on the impact of mindfulness-based art therapy indicates a physiological effect of this intervention. Ando and Ito's (2016) study on the impact of mindfulness-based art therapy with Japanese college students demonstrated changes in ANS responses which occurred differently for participants with different states of mental health. Specifically, individuals considered low-risk according to their responses to the General Health Questionnaire (GHQ) experienced greater increases in ANS activity compared with those considered high-risk participants (Ando & Ito, 2016). This research indicates MBAT interventions impacted physiological responses. Additional research is needed to explore the impact of the art process on mindfulness.

Current research has examined the impact of stress on medical students. Patients benefitting from professionals practicing mindfulness have also been identified. Interventions aimed at addressing medical student distress may provide benefits not only for medical professionals, but also their patients. Mindfulness-based interventions and art therapy have been utilized with various populations and present a feasible approach to improving self-care and well-being among medical students. There is an absence of research measuring the impact of incorporating art therapy into a mindfulness enhancement training program on mindfulness and coping.

Given the aforementioned gaps in the literature, the purpose of this study was to examine the impact of adding art therapy to treatment as usual (TAU) in a mindfulness enhancement training program with a medical student. Four research questions guided this study. First, what is the impact of adding an art therapy component to mindfulness enhancement training on mindfulness in a medical student? Second, what is the impact of adding an art therapy component to mindfulness enhancement training on coherence in a medical student? Third, how does the medical student rank satisfaction with different aspects of the intervention in mindfulness enhancement training and mindfulness-based art therapy? Fourth, what media did the medical student employ in mindfulness-based art therapy and how did the medical student rank satisfaction with employed media?

Method

Design

An ABAB single subject research design was employed to evaluate the impact of adding an art intervention to treatment as usual (TAU) in a mindfulness enhancement training for a medical student. For this study, mindfulness enhancement training was A and B was a mindfulness-enhancement training with art therapy utilizing mindfulness-based art therapy

(MBAT). In an ABAB research design, a baseline measurement is followed by an intervention (Long & Hollin, 1995). An intervention is presented and withdrawn over the course of four phases. Repetition strengthens internal validity in this design (Kazdin, 2003).

Continuous baseline data was collected from a participant over three sessions during the initial phase of mindfulness enhancement. Following the first three sessions, an art therapy intervention was introduced during three sessions of MBAT and continuous data was collected. Continuous data was then collected for a second baseline after the art therapy intervention was withdrawn for the final three sessions of mindfulness enhancement training. Data was collected for the final three sessions after the art therapy intervention was reintroduced. Quantitative questions seeking the participant's experience with mindfulness training and mindfulness-based art therapy was explored in a post-intervention questionnaire administered at the end of the final MBAT session in addition to single subject design.

Participant

The participant in this study was the first medical student recruited who met the following criteria: (1) enrolled in a medical school program, (2) no previous experience with art therapy or mindfulness enhancement training. Volunteers responded to a recruitment flyer sent out by email and were screened for eligibility. The first volunteer to meet criteria was selected as a participant. During an initial meeting with the participant, informed consent was obtained and demographic information was gathered. Participant A was a 22-year-old multi-race female medical student. The participant was given two \$25 VISA gift cards upon completion of the study.

Measures

Mindful Attention Awareness Scale Short (MAAS-S). Black, Sussman, Johnson, and Milam (2012) developed a short version of Brown and Ryan's (2003) 15-item Mindful Attention Awareness Scale

(MAAS). The original 15-item MAAS is a self-report measure intended to assess individual differences in attention to and awareness of present-moment experiences in daily life over time (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003). Items are scored on a six-point Likert-type scale ranging from 1 (almost always) to 6 (almost always). Higher scores indicate more mindfulness (Brown & Ryan, 2003). Black et al. (2012) reported a Cronbach's alpha at .89. The MAAS-S also demonstrated excellent convergent and discriminant validity (Black et al., 2012).

University of Tokyo Health Sociology Sense of Coherence Scale (SOC-3-UTHS). Togari, Yamazaki, Nakayama, and Shimizu (2007) developed a short three-item version of Antonovsky's (1987) Sense of Coherence Scale (SOC) for use in population surveys. The SOC is a self-report measure intended to assess an individual's capacity to respond to stress (Eriksson & Lindström, 2005). Antonovsky (1987) originally conceptualized the SOC within a foundation of salutogenic theory. Rather than view stress with a pathogenic orientation, Antonovsky's SOC explores "the ability for people to understand what happens around them, to what extent they were able to manage the situation on their own or through significant others in their social network, and the ability to find meaning in the situation" (Eriksson & Lindström, 2005, p. 460). Responses are rated on a seven-point Likert-type-scale ranging from 1 (almost always) to 7 (never). Togari and Yamasaki (2016) reported Cronbach's alpha coefficients between .80 and .84. A one-year stability coefficient among a young Japanese cohort was found to be .70 (Togari & Yamasaki, 2016).

Post-Intervention Questionnaire.

The primary investigator developed an eight-item satisfaction to assess the participant's experience with mindfulness training and mindfulness-based art therapy. Participant's satisfaction with mindfulness and mindfulness-based art therapy are evaluated by the first seven items and are scored on a five-point Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree). Item 8 identifies art materials utilized and participant satisfaction with art materials.

Intervention

Overview. Session length for mindfulness enhancement training and MBAT was 90 minutes. Twelve sessions were conducted in total.

Mindfulness Enhancement. The principles for MBSR outlined by Kabat-Zinn (1990) used during three sessions which comprised the mindfulness enhancement intervention.

Mindfulness Enhancement

Session 1. Session began with a five-minute seated meditation followed by a 20-minute introduction and orientation to the principles of mindfulness. A 45-minute body scan was then conducted with a 20-minute discussion of the body scan experience and outline of weekly practice following practice. The participant was instructed to practice at least 15 minutes of mindfulness each day as well as complete a pleasant events calendar in between the three mindfulness enhancement sessions.

Mindfulness Enhancement

Session 2. Session began with a five-minute seated meditation. A 25-minute discussion of the participant's experience meditating in between sessions followed by a review of the pleasant events calendar. A 30-minute walking meditation was introduced and practiced. Following the walking meditation, a 15-minute meditation position experiential and 15-minute discussion concluded the session. The participant was advised to continue meditating for at least 15 minutes each day and complete an unpleasant events calendar.

Mindfulness Enhancement

Session 3. A five-minute seated meditation began the session. Following the meditation, a 25-minute discussion explored the experience of the participant between session and the completed unpleasant events calendar. The medical student then completed a 40-minute seated breath as object of awareness experiential. A 10-minute movement meditation followed by a 10-minute discussion concluded the final 20 minutes of session three. Instructions for the participant to continue meditating for at least 15 minutes each day were provided.

Mindfulness Based Art Therapy

(MBAT). MBAT sessions included art therapy directives developed by Peterson (2009, 2014; personal communication, August 21, 2016). Each MBAT session included the following materials: various paper consistencies including smooth, rough, watercolor, and tissue paper along with oil pastels, acrylic paint, chalk pastels, graphite pencils, crayons, and charcoal. Also available were 18" x 24" white paper and tape.

MBAT Session 1. A 30-minute Mindful Exploration of Art Materials (MEAM) began the session (Peterson, 2009). Following the MEAM, a 45-minute Exploring the Mind Body Experience in the Here and Now was completed (Peterson, 2009). A 15-minute discussion concluded the session. The medical student was instructed to meditate for at least 15 minutes each day and complete a mandala after each meditation. The medical student was also instructed to bring their pleasant and unpleasant events log to the next session.

MBAT Session 2. The session began with a 10-minute discussion of the medical student's experience between session and sharing of mandalas. The Pleasant and Unpleasant/Stressful Event Pictures was then completed for 30 minutes, after which the medical student completed The Feeling Vocabulary in the Body directive for 35 minutes (Peterson, 2009). A 15-minute discussion concluded

the session. The medical student was instructed to again complete daily meditation and mandala practice.

MBAT Session 3. The session began with a 10-minute discussion of participant's experience over the last week and sharing mandalas. Exploring Mindfulness Meditation Practice directive was introduced followed by creating an Image of a Healing Place (Peterson, 2009). Both directives were 40 minutes in length. The medical student was advised to continue to meditate for 15 minutes each day and discontinue mandalas at the end of Phase One. At the end of Phase Two, the medical student was advised the study was over but she could continue to practice mindfulness and mindful art making if desired.

Therapist

The first author was an experienced art therapist with advanced training in both MBSR and MBAT. The art therapist completed an intervention fidelity checklist for mindfulness enhancement training sessions and MBAT sessions at the end of each respective session. Mindfulness training sessions maintained 100% fidelity to the principles of mindfulness. MBAT sessions also upheld 100% fidelity to principles and essential features of MBAT and mindfulness.

Data Analysis

Over the four phases of this study, scores from MAAS-S and SOC-3-UTHS were collected and graphed (Spriggs & Gast, 2010). A visual analysis of graphs was conducted to evaluate the impact of the intervention (Spriggs & Gast, 2010). In order to detail the magnitude of impact of the intervention, percentage of non-overlapping of all pairs was calculated (Parker & Vannest, 2009). A NAP online calculator was employed to compute NAP for each AB phase and all AB phases combined (Vannest, Parker, & Gonen, 2011). The post-intervention questionnaire collected participant satisfaction during the final MBAT session and was evaluated by the art therapist.

Results

Results of the medical student's SOC-3 scores and MAAS-S scores were collected at the end of each session and are represented in graphic form as shown in Figures 1 and 2. NAP scores for mindfulness in each AB phase included 1.00 comparing A1 to A2, 0.8889 comparing A1 to B1, 1.00 comparing B1 to A2, and 0.8889 comparing A2 to B2. The NAP score for mindfulness across all AB phases combined was 0.6944, indicating a medium effect size. NAP scores for sense of coherence over each AB phase included 0.2778 comparing A1 to A2, 0.6111 comparing A1 to B1, 0.3333 comparing B1 to A2, and 0.7222 comparing A2 to B2. The total sense of coherence across all AB phases combined NAP score was 0.6389, reflecting a small effect size for sense of coherence.

The first seven questions of the post-intervention questionnaire documented the medical student's satisfaction with aspects of mindfulness enhancement training and mindfulness-based art therapy. In response to the first statement, mindfulness practice without art was helpful, the medical student responded 2 (Agree). The medical student responded 2 (Agree) to the second statement, mindfulness practice with art was helpful. In response to the third statement, practicing mindfulness between sessions was helpful, the medical student responded 1 (Strongly Agree). The medical student responded 2 (Agree) to statement four, practicing mindfulness-based art between sessions was helpful. In response to statement five, discussion was helpful, the medical student reported 1 (Strongly Agree). The medical student responded 1 (Strongly Agree) in response to statement 6, the art therapist promoted mindfulness. In response to statement seven, the product promoted mindfulness, the medical student reported 3 (Neutral).

Media utilized by the participant during MBAT sessions was identified by the participant in the eighth question of the post-intervention questionnaire. Results are presented in Table 1. The participant

reported affirmative to using acrylic paint, watercolor paint, oil pastels, color pencils, graphite pencils, color markers, and tissue paper. Crayons were not used during mindfulness-based art therapy. In addition to identifying what materials were used and not used during mindfulness-based art therapy sessions, the participant identified her experience with each material used. The participant reported 3 (Neutral) to the statement using acrylic paint promoted mindfulness, using oil pastels promoted mindfulness, using colored pencils promoted mindfulness, and using colored markers promoted mindfulness. The participant reported 2 (Agree) with the statements using watercolor paint promoted mindfulness, using chalk pastels promoted mindfulness, using graphite pencils promoted mindfulness, and using tissue paper promoted mindfulness.

Discussion

This study is the first of its kind to explore the impact of adding art to mindfulness enhancement training with a medical student and was guided by four research questions. The first research question investigated the impact of adding an art therapy component to mindfulness enhancement training on mindfulness in a medical student. Examination of mindfulness NAP scores spanning all AB phases combined revealed a medium effect size. Increased mindfulness during MBAT phases is apparent upon visual analysis of the median mindfulness scores for each phase. The addition of art therapy to mindfulness enhancement training with a medical student contributed to a moderate increase in mindfulness. One possible explanation for this result is that MBAT did not have a pejorative effect on the medical student's upward trajectory of mindfulness. It may be the case that once introduced, principles of mindfulness could not be unlearned and MBAT did not detract from the medical student's experience of mindfulness. Kember (2016) and Cavanagh et al. (2013) studied brief online mindfulness interventions and found even brief

mindfulness interventions increased mindfulness. Furthermore, the medical student reported continuing to actively practicing mindfulness through guided meditations and nonjudgmental awareness of the present moment during examinations and challenging experiences during her day.

A second explanation for this result may be related to longer gaps in mindfulness enhancement training session meetings due to unforeseen circumstances. A one week gap occurred between mindfulness enhancement training Phase One Sessions Two and Three due to weather. Another week gap between MBAT Phase One Session Three and mindfulness enhancement training phase two session one occurred due to conflicting schedules of student and art therapist. Gaps in sessions may have impacted the medical student's training and overall experience of mindfulness during mindfulness enhancement training phases. Scores between interrupted sessions one and two demonstrate a very small drop in mindfulness, from 23 to 21. In addition, the second interruption occurred between phases, not impacting frequency of either MBAT phase one of mindfulness enhancement training Phase Two.

A third explanation for this result may be that MBAT fosters the principles of mindfulness through art making and facilitation of art directives by an art therapist. McNiff (2014) postulated the inter-relatedness of mindfulness and the art therapy process, suggesting focus on breath during meditation is mirrored by focus on movement and expression during art making. Further support for the inter-relatedness of mindfulness and art therapy which may result in increase in mindfulness during MBAT may be found in the Expressive Therapies Continuum (ETC) (Hinz, 2009; Kagin & Lusebrink, 1978). The ETC is a conceptual model employed by art therapists to classify media interactions and art therapy processes. Applying the Kinesthetic/Sensory Level (KS) during MBAT may focus the participant's attention to both physical and sensory experiences

and may be harnessed to further promote mindfulness. The KS was emphasized during the MEAM (Peterson, 2009). Moving up the ETC to the Perceptual/Affective Level (PA), Cognitive/Symbolic Level (CS), and Creative Level (C) may further promote the principles of mindfulness, increasing mindfulness for the participant. Examples of an integration of PA, CS, and C can be found in the medical student's completion of *The Feeling Vocabulary in the Body*, *Exploring Mindfulness Meditation Practice*, and *Image of a Healing Place* (Peterson, 2009).

Of the three explanations presented for the moderate increase in mindfulness found in this study, the most likely explanation is MBAT did not detract from the medical student's upward trajectory of mindfulness. This is likely the case because the student actively reported engaging in mindfulness enhancement training practice, paired with MBAT, and visual analysis of mindfulness scores indicated only a one-point increase between mindfulness enhancement training scores and MBAT scores.

The second research question guiding this study explored the impact of adding an art therapy component to mindfulness enhancement training on coherence in a medical student. Combined NAP scores across AB phases demonstrated a small effect size. Median scores for sense of coherence analyzed visually for each phase indicated a slight increase during MBAT. Three possible explanations for the slight increase in sense of coherence during MBAT are present. First, the impact of interruptions during mindfulness enhancement training may have impacted scores. Because phases one and two of MBAT did not have any interruptions in session meetings, the student may have experienced increased sense of coherence. Weather-related challenges and resulting displacement of the medical student presented during the first week of mindfulness training may have directly impacted the student's confidence in comprehensibility, manageability, and

meaning of external experiences beyond her control. However, SOC-3-UTHS scores between the first interruption do not indicate a significant change in score. In fact, the reported sense of coherence score of 15 remained stable between mindfulness enhancement training Phase One Sessions One and Two. The second interruption occurred at a natural stopping point between phases.

A second possibility for the slight increase in sense of coherence presented in this study is that MBAT may promote a slight increase in sense of coherence by moving the student through higher levels of the ETC (Kagan & Lusebrink, 1978). MBAT Sessions Two and Three employed art processes incorporating higher levels of the ETC including the Perceptual/Affective Level as well as the Cognitive/Symbolic and Creative Levels. Within these higher levels, the medical student was able to identify, symbolically represent, and discuss feelings, pleasant and unpleasant experiences, and the experience of mindfulness.

Meghani et al. (2018) identified a salutogenic effect of MBAT, specifically within the constructs of comprehensibility and meaning. Results from Meghani et al.'s (2018) study found no significant change in the construct of manageability. In the current study, it is possible that MBAT provided an opportunity to foster comprehensibility and meaning through the employment of art directives designed to promote order and understanding of life events. The medical student followed directions and reflected upon feelings and experiences during each MBAT directive. MBAT may have offered the medical student reinforcement of sense of coherence by engaging in higher levels of the ETC.

Lastly, a third possibility for the slight increase in sense of coherence is the role of discussion that accompanied art making. The student actively participated in discussion of artwork and verbally processing thoughts, feelings, challenges, and experiences through the lens of

mindfulness as came up from the art work. Discussion of artwork in MBAT may have provided additional promotion of sense of coherence. Dobkin and Zhao (2011) noted the reported importance of large group discussion as one of several aspects that may attribute to benefits observed in MBSR, including increased sense of coherence. Although this study included one participant rather than a group, discussion between art therapist and the medical student was reported to be very important to the participant. Of the three explanations, it is likely that MBAT promoted a slight, though not significant, increase in sense of coherence by advancing the student along the ETC. Discussion also occurred during mindfulness enhancement training; however, visual analysis indicated a slight drop in median sense of coherence scores.

The third question guiding this study explored how the medical student ranked satisfaction with different aspects of the intervention during mindfulness enhancement training and mindfulness-based art therapy. Overall, the participant's responses indicated mindfulness practice with art and without art were both helpful, as was practicing mindfulness with art between sessions. Practicing mindfulness between sessions and discussion were strongly agreed to be helpful, and the art therapist was strongly agreed to promote mindfulness. A neutral response was provided for the product being helpful in promoting mindfulness. One explanation for these results may be the therapeutic alliance built between the art therapist and medical student. Bordin (1979) defined the therapeutic alliance as an agreement on goals of therapy, tasks of therapy, and the positive bond between therapist and client. Results from Goldberg, Davis, and Hoyt's (2013) analysis of the effect of the therapeutic relationship on outcomes of a mindfulness-based smoking cessation intervention suggested therapeutic alliance measured midtreatment predicted improvement in mindfulness scores. It may be that the therapeutic relationship created by the medical student and art therapist

fostered discussion during MBAT and mindfulness enhancement training, thus promoting medical student satisfaction.

Another explanation for the medical student's reported satisfaction may be the result of repetition of practice. Mindfulness practice was emphasized in both mindfulness enhancement training and MBAT sessions, with discussion in each revolving around the experiences of practice. Though the product created during MBAT sessions represented the experience and feelings associated to practice by the medical student, the product itself was reported to be neither helpful nor unhelpful in promoting mindfulness. However, Ribeiro, Atchley, and Oken (2018) highlight conflicting results found in the literature pertaining to optimal dosing of practice and the potential for effects to be due to other rationale rather than practice time. Thus, given the former and latter explanations for the medical student's reported satisfaction with elements of the intervention the most likely explanation is the former.

The fourth question explored in this study was which media type did the medical student employ in mindfulness-based art therapy, and what was their experience with media used? The medical student reported using all materials but crayons. Watercolor, chalk pastel, graphite pencil, and tissue paper were agreed to being helpful in promoting mindfulness. Acrylic, oil pastel, colored pencil, and colored marker were reported neutral in being helpful in promoting mindfulness. These results indicate the medical student found watercolor, chalk pastel, graphite pencil, and tissue paper helpful in promoting mindfulness of all materials used.

Art therapists conceptualize art materials along a continuum of fluid to resistive and incorporate this continuum into considerations for the ETC (Hinz, 2006, 2009; Kagin & Lusebrink, 1978). Watercolors and acrylic paint comprise the more fluid end of the continuum, providing users with a more affective experience. Graphite pencils and colored pencils are

found on the resistive end of the continuum and provide users with a more cognitive experience. The medical student identified some fluid materials to be helpful in promoting mindfulness. These included watercolor and chalk pastel. Graphite pencil was also identified as helpful in promoting mindfulness and can be found on the opposite end of the continuum.

One explanation for the medical student's media choice is preference of material and potential positive association as a connection to mindfulness. The medical student reported familiarity with art materials and a history of art making during MBAT. During the MEAM (Peterson, 2009), the student engaged in all materials and noted the differences in sensory experiences when using art media on tissue paper. The student also acknowledged positive associations with watercolor and chalk pastel. The most frequent materials used by the student during MBAT sessions were chalk pastel, oil pastel, and colored marker. Frequency of materials used does not align with the report of materials helpful in promoting mindfulness; however, the medical student may have associated pleasant experience of material usage to promotion of mindfulness. Acrylic paint provided to the medical student was observed by the medical student to be different than acrylic paint used in the past, and more challenging to mix due to viscosity.

A second explanation for the medical student's experience with the media may be the connection of media use with prescribed art directives during MBAT sessions. Chalk pastel was used in both phases of the Pleasant and Unpleasant/Stressful Event Pictures (Peterson, 2009). Watercolor and acrylic paint were used twice over the course of MBAT, first during the first phase of Exploring Mindfulness Meditation Practice and next during the second phase of Pleasant and Unpleasant/Stressful Event Pictures (Peterson, 2009). Graphite pencil was during the first phase of The Feeling Vocabulary in the Body (Peterson, 2009).

All materials were used during both phases of the MEAM (Peterson, 2009). It is likely that that of the two explanations presented, the most plausible explanation is the medical student's preference for art materials because of the positive association described during the MEAM (Peterson, 2009).

Results from this study must be considered in relation to three limitations. First, the nature of an ABAB single-subject research design with one participant means generalizability of results across all medical students is limited. Replication aims to increase reliability within the ABAB design. Second, multiple treatment effects are possible due to the exposure of the medical student to two treatments: mindfulness enhancement training and MBAT. Third, it should be noted that the study took place during the first half of the semester and regular schedule of weekly sessions were interrupted on two occasions. Depending on the medical student's experience with her external environment, including course work, social life, and examinations, the semester may have presented a gradual decrease in stress or increase in stress, impacting MAAS and SOC-3-UTHS scores.

The obtained results suggest three implications for future research. First, continued research is necessary in the field of art therapy and specifically in applications of art therapy to mindfulness and sense of coherence. The potential use for single-subject research design in art therapy research is copious. Due to the threats to internal and external validity presented in this study, a multiple baseline design may be considered for future studies. Furthermore, qualitative research exploring the experience of participants in MBAT and with specific art materials will provide deeper insight into the role of art in promoting mindfulness and sense of coherence. Expanding research to a wider range of health care professionals, not just medical students, is also needed. Researching MBAT with healthcare professionals will promote greater understanding of the impact of MBAT for

various populations and potentially promote well-being that can impact healthcare professionals and their patients.

The second implication involves studying the impact of the therapeutic alliance in art therapy. The medical student strongly agreed that the art therapist, discussion, and mindfulness practice were helpful in promoting mindfulness. The therapeutic alliance may have increased the medical student's engagement in sessions. One question presented from this study is as follows: What impact does art making have in building a therapeutic alliance? Future research is suggested to explore the impact of therapeutic alliance on the experience of the participant in art therapy as well as the impact of art making on the therapeutic alliance. Research into applications of the ETC to MBAT is a stimulating third implication for future research in art therapy presented by this study. Given the prominent role the ETC plays in art therapist's conceptualization of media and processes within art therapy, it may be plausible that utilization of various levels of the ETC can amplify mindfulness and sense of coherence not only during MBAT but in art therapy practice in general.

Analysis of results from this study call attention to three important implications for future practice. These include application of MBAT with clients, the role of the ETC in supporting mindfulness and sense of coherence, and the role of the therapeutic alliance. First, application of MBAT to work with clients should be considered. Utilizing a salutogenic approach to art therapy with clients, increasing client comprehensibility, manageability, and meaning may be helpful in attaining treatment goals. Thus, art therapists can consider incorporating MBAT into work with clients to promote mindfulness and sense of coherence. A second exciting implication for the practice of art therapy relates to the role of the ETC. Art therapists regularly apply the ETC to work with clients; however, this study suggests considerations for the ETC may be applied to promote mindfulness and

sense of coherence among clients. Consideration of client preference for materials is further supported by this study. A client may associate materials as helpful in promoting mindfulness that do not directly align with a certain region along the continuum from fluid to rigid. Continued self-reflection of personal preference and art therapist engagement with client in exploring materials is further supported by this study. The third implication for art therapy practice presented in this study is the role of the therapeutic alliance in art therapy. The therapeutic alliance emphasizes the role of aligning goal, task, and bond between therapist and client (Bordin, 1979). The therapeutic task in art therapy is typically an art task. Art therapists should consider the therapeutic alliance in art therapy, and specifically when applying MBAT, to further support a salutogenic effect for the client.

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Table 1*Materials Used During MBAT*

Material	Used	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Acrylic Paint	Yes			X		
Watercolor Paint	Yes		X			
Oil Pastels	Yes			X		
Chalk Pastels	Yes		X			
Colored Pencils	Yes			X		
Graphite Pencils	Yes		X			
Crayons	No					
Color Markers	Yes			X		
Tissue Paper	Yes		X			

Figure 1

This figure shows MAAS-S scores across mindfulness enhancement training phases and MBAT phases. Presented are the medical student's mindfulness scores during each phase and includes a median line.

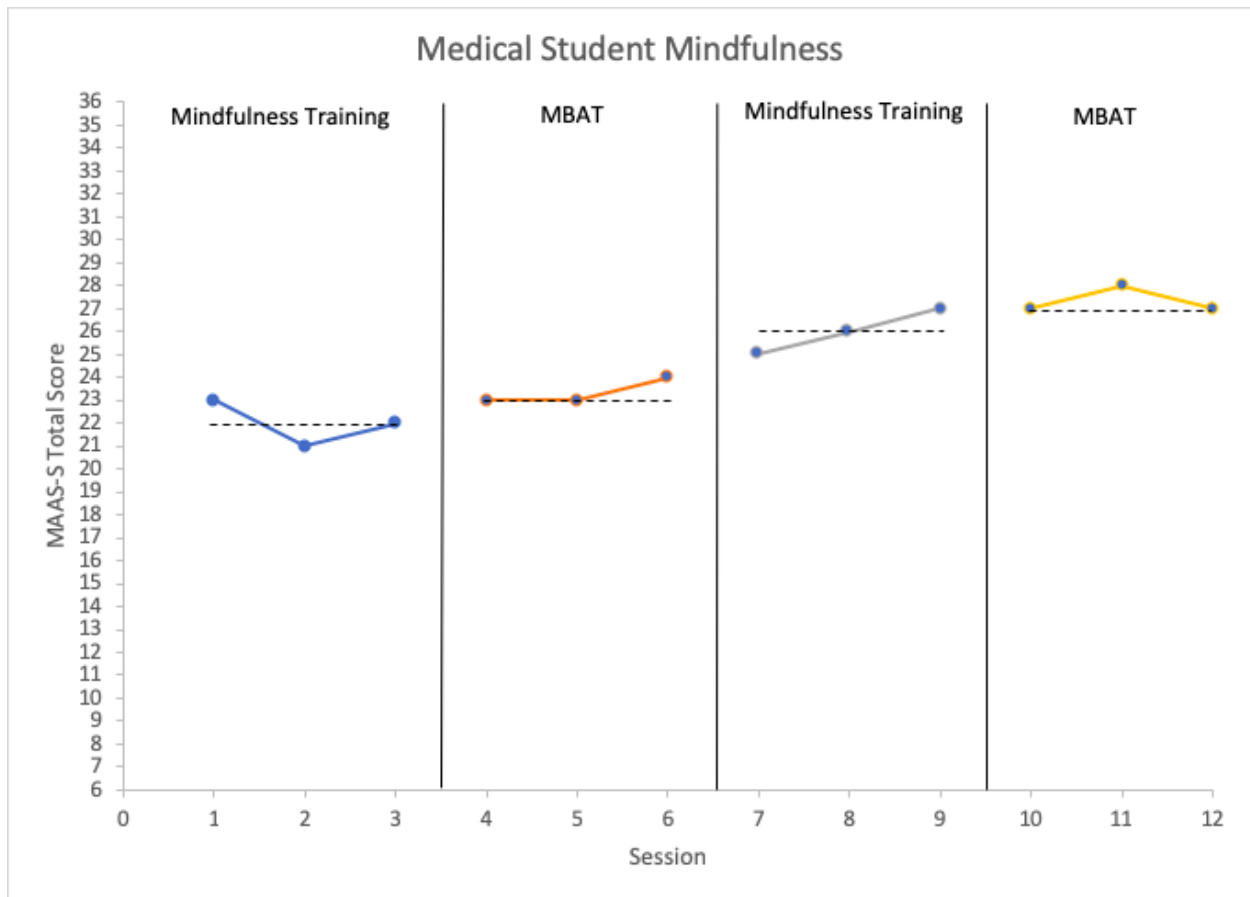


Figure 2

This figure shows sense of coherence scores across all phases of mindfulness enhancement training and MBAT. The medical student's SOC-3-UTHS responses for each phase of treatment along with the median score line for each phase are presented.

