

The Following is Mary Holman-Anderson's "Review of Literature".



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Review of Literature, Analysis, Reflections

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Introduction to process, article choice, and order of presentation

Because the therapeutic approach in which I am most interested is an emerging field, I found taking a divergent thinking process to be the most beneficial approach in order to begin a review of the current literature applicable to my topic. Divergent thinking explores seeming disparate ideas and pieces of information, then, using a funneling and filtering processes (convergent thinking), distills those disparate ideas into a structured, cohesive new whole—synthesis, if you will. Part of the goal of any research undertaking, including a review of literature, is to solve or more deeply understand a problem. If one simply follows one track, one will only find what has been discovered on that one track and will find only one solution—one that has already been found. But if one follows a more exploratory model—many paths, and tracks the paths that lead to each of those paths (reference sections from one article lead to information from many articles), the connectedness of the ideas begins to emerge, perhaps in a new light. That is not to say that I have created something new and earth shattering here, but as I began to look in new areas for research that related to my original topic (but with a broader lens), I found that others, too, are engaging in this thinking. As a result, this review is the synthesis of over 20 articles, some of which will be reviewed in more detail than others (in order to stay within the length guidelines of the assignment) but without culling those that helped build the bridges in my thinking which has resulted in future direction of my work.

The focus for this review of literature is the use of Mindfulness Based Cognitive Therapy (MBCT) and Yoga Therapy (including asana, mantra and meditation) as therapeutic intervention or complementary therapy for children with disabilities, particularly those on the autism spectrum (ASD) and their families and caregivers. The “story” told by its contents is one of emerging awareness and represents a broadening of my own thinking as well as the thinking of some authors by moving from examining the effects of these approaches to autism per se, into including research that explores the effect of these interventions on the many specific neurological, cognitive, and behavioral characteristics of autism as well as some of the conditions comorbid with autism. The "story" also seeks to highlight the need to build some bridges—between Eastern and Western thought, between complementary/alternative wellness-centered approaches and the modern medical model and providers, between mental health services and public schools, and, perhaps most importantly, between children on the autism spectrum and their parents, families and caregivers.

For these reason, this review begins with the article that began this divergent thinking process approach, moves through some of the latest research on the efficacy of these interventions, and opens the application of all of the information that follows to use with not only children diagnosed with ASD but also their families and caregivers. We then look at the need for early intervention, review a personal account that highlights some of the potentials but realistically discusses the challenges of working this population. The next articles offer some models for actual treatment, discuss the need for program standardization and the standardization of counselor education requirements for therapists who wish to engage in these therapeutic approaches as well as offer a model for this training. We then move through some approaches to group work for this and similar populations, begin to explore the potential for linking these approaches with established healthcare providers and more traditionally accepted mental health therapies (CBT, ACT) then move into a look at the applicability of this work to a school setting. We then broaden out, or perhaps more “get in the weeds” of a broader lens as discussed above, to look at studies involving therapeutic meditation and yoga as they impact related topics such as Alpha rhythm modulation and the relation of those issues to the symptomology of ASD such as imitation, working memory, language skills, depression, anxiety, stimming and attention focus, as well as comorbidities with physical illness. Then we examine the

application of these interventions with other populations, some of whom share some of the symptoms of those in the autistic community. The goal is to take both a broad, creative and narrow, focused look at the literature rather than attempt to over generalize as we recognize the need for more research, but perhaps also realize that related studies are being done that are applicable to the ASD population, but we are not accessing them as such. The “story” rounds out with recognition of the need to not overwhelm a largely Western-thinking population with Eastern philosophies, but suggests that these approaches have the potential build one bridge to help increase the probability of positive outcomes for this population.

Research as a Guide to Counselor Efficacy

As the American Counseling Association Code of Ethics (2005) highlights in numerous sections, ethical practice is largely based upon the use of treatment approaches, therapies and interventions that have a solid basis in evidence provided by sound, valid, research studies that employ data-based problem solving (Sheperis, Young & Daniels, 2010). This will require a mix of quantitative, qualitative and mixed methods approaches as well as efforts at program evaluation than informs ongoing and future practice. All of these approaches proved to be important as I sought to begin to address my exploration of the studies conducted in the area of MBCT and Yoga Therapy. Quantitative data was often used in a pre-test/post-test model, but as also used to identify the necessary components of author-created surveys or interviews. In articles involving phenomenon, and relationships, this usually only provided part of the needs of the study, the other provided through the use of qualitative methods as well (mixed Methodology Model). However, in some cases, such as those studies in brain function, quantitative data on its own was the best and most objective and defensible approach. To discover and explore issues more related to quality than quantity, researchers tended to use qualitative data collection methods such as interviews and archival data, but most needed or wanted (for the sake of their work being considered “hard science”) to employ quantitative methods as well and at times this seemed almost forced. Meta-analysis also proved an important method as authors began to look at existing data in new ways.

Qualitative methods involve gathering data through a process that translates into a numeric system that can be evaluated through the use of statistics that perform data analysis. Some of the quantitative methods used most frequently were standardized tests to determine either the behavioral baseline of cognitive functioning abilities of study participants and then as post test after intervention while others focused on magnetoencephalography (MEG), electroencephalogram (EEG), positron emission tomography (PET) and Magnetic resonance Imaging (MRI) baseline and follow up data. Common statistics used to analyze these data are as simple as mean, median and mode and standard deviations or others that measure inter rater reliability (occurrence/nonoccurrence or kappa) or instrument (split half) reliability like the Spearman-Brown R (Sheperis, Young & Daniels, 2010) or those that perform explanative analysis like MANCOVA within groups and ANOVA between groups.

Qualitative data was largely gathered through interviews, informal and formal, and focus group discussion. In some cases this data is coded in order to be able to perform analysis only applicable to numeric values. In others studies, interview data was used to inform the content of author-created questionnaires and surveys.

Because of the scope of these articles, particulars concerning the nature of the methodology and data analysis methods used will be included in the discussion of each article for the sake of clarity and cohesion.

Reviews of Literature that Guided Creative Process

The article that has the broadest significance in this process, “Meditation as a Potential Therapy for Autism: A Review” (Sequeira & Ahmed, 2011) leads this discussion because of its depth and rich detail and the authors decision to include a detailed discussion of the brain function and brain development relevant to discussion of autism, the molecular mechanisms of autism including structural abnormalities and at what age they occur, as well as details about the death of inhibitory neurons that, combined, lead to the hyperplasticity, hyperperception, hypermemory, hyperattention and hyperemotionality (Sequeira &

Ahmed, 2011) often found in people with ASD. Additionally, this article provides specific explanation of how various steps in the meditative process on specific brain waves, affect interhemispheric synchronicity and hormone secretion. While the focus of this article is autism, the authors also take opportunities to broaden out the explanations to include other groups that might benefit from these various effects. Not least, the easily accessible reference list (coded by a system of numbers rather than the constant interruption of parenthetical documentation) proved invaluable as a tool by which studies that helped clarify some of these theories and findings could be accessed.

Although the articles discussed in Richard Hastings, “Mindfulness and Acceptance in Developmental Disabilities” (2013) were not as easily accessed as those in Sequeira and Ahmed, (2011) review, they represented some newer work in the same area but with a different angle. In a special issue of the journal, *Mindfulness* (2013), editors Hastings and Manikam have brought together articles from a number of practitioners and researchers in the United Kingdom who explore the effects of mindfulness interventions on parents, caregivers, and individuals with intellectual disabilities as well as their perspective on mindfulness interventions (2013).

Studies Focused on Parent Involvement and Outlook

One of those articles, “Comparative Effects of Mindfulness and Skills-Based Parent Training Programs for Parents of Children with Autism: Feasibility and Preliminary Outcome Data” (Ferraioli & Harris, 2012) takes a close look at the dynamics and interworkings of children on the autism spectrum and their parents and caregivers and compared those dynamics to homes of typically developing children and those with children with chronic illness or other developmental disabilities. The study, using quantitative methods, found that parents of children with ASD children report higher levels of stress than those with children with other disabilities and health challenges, as well as an inverse relationship between parental stress and treatment gains in children. Fifteen parents of children with autism were pre-tested then matched on a measure of parental stress then, dependent on those outcomes, were randomized into one of two treatment groups. One group received didactic, discussion, role play and homework intervention, the other also received mindfulness-based intervention. After a post-test and three-month follow-up test, only the mindfulness group demonstrated statistically significant improvement on both outcome measures following treatment.

The second article in *Mindfulness* (2013), Mindful Parenting Decreases Aggression, Noncompliance, and Self-Injury in Children With Autism, Singh et al., 2006 was the first that I found that, instead of looking at the “big picture” of Autism, began looking at specific problematic behaviors, in this case, aggression, non-compliance and self-injury. The authors used meta-analysis to explore techniques used with children with intellectual and developmental disabilities over a scope of thirty years, yielding over 60 different techniques. The article tracks the shift to a positive behavior support philosophy in the 90s and the shift from institutionalized care to parent care giving. Here, the authors point out work that indicates that parents, now the primary caregivers, would benefit from a comprehensive approach to behavioral interventions, with one of the more recent approaches to intervention actually focusing on the parenting style rather than just on the child’s behaviors—that approach being “mindfulness” (Singh et al., 2006).

We will look closely at the next section of the article closely as it breaks ground on a new approach to behavioral change in autism. The goal of the quantitative component of this study was to determine whether parents of ASD children could reduce their child’s negative behaviors (the three listed above) by changing their own behavior when they interacted with their child. The authors also sought to better understand the relationship between mindful parenting practices and self-reported parental satisfaction with their own parenting skills and their interactions with their children. After collecting cognitive functioning data on each child, the authors proceeded with a study group of three parent-child dyads. The authors collected behavioral data through event recording of the target behaviors by the mothers. Fathers served as reliability observers. The reliability result was 96%. Additionally, each mother completed three instruments” the Subjective Units of Parenting Satisfaction (SUPS), the Subjective Units of Interaction Satisfaction (SUIS) and the Subjective Units of Mindfulness (SUUM). A multiple baseline of the three

parent-child dyads was run prior to any intervention, followed by additional baselines at week 5, 12 and 15(Singh et al., 2006).

Formal training in mindful parenting using one-on-one training by the senior investigator, a specialist in mindfulness interventions, as well as a text on mindful parenting ran a training phase course of 12 weeks (24 hours). At that point, the practice phase of 52 weeks began, and parents then took the post-tests. Aggressive behaviors showed an mean decrease of 88%; non compliance behaviors showed a mean 68% decrease, and self-injurious behaviors decreased at a mean of 68%. Mother's self-satisfaction increased from 15 to 40% across the three dyads, and mother rated quality of interaction with their children increased from 55% to 87% across the three dyads(Singh et al., 2006).

The researchers assert that these findings support the hypothesis that mindful parenting can decrease negative behaviors and increase parental satisfaction with parenting skills and quality of interactions with their children. While recognizing that methodology in this area is not well-established, and the collection of behavior data by event recoding parents (or any observer) can be somewhat subjective, they were satisfied that, with mindfulness, although changes are slower to emerge, they represent the formation of new neural networks available to the children (a finding similar to another study to be considered later on the topic of Alpha Wave modulation) and signify more internalized changes that signify change not only to the behaviors but to the very nature of the individual (Singh et al., 2006).

In a study that used both qualitative and quantitative methods (mixed method) to explore another family aspect of treating children with disabilities--that nature of hope and stress in the family dynamics of ASD children and children on the Fetal Alcohol Disorder Spectrum (FASD); "'I'm hoping, I'm hoping...'" Thoughts About the Future from Families of Children with Autism or Fetal Alcohol Spectrum Disorder in Ontario," Watson, Hays, Radford-Paz and Coons (2013) examine these particular disorders because they are both spectrum disorders with other commonalities such as frequent comorbidity with other mental health challenges and physical health challenges.

The authors used two psychometric instruments to gather quantitative data: the Parenting Stress Index (a subscore of 31 of the 52 items contained on the "Questionnaire on Resources and Stress"—QRS-F and the Hope Scale (an 8-point Likert-type scale). Interview questions used to gather qualitative data were semi-structured questions asked during 45-minute-to-three-hour interviews, with follow-up questions being asked and answered through email correspondence(Watson, Hays, Radford-Paz & Coons, 2013). The analysis for the Hope scale was done using Chronbach's Alpha Coefficient. The Kuder-Richardson Coefficient and t tests (to compare hope between the FASD and Autism groups) were used to analyze the QRS-F survey. Interpretive phenomenological analysis was performed on the interview data (Watson, Hays, Radford-Paz & Coons, 2013).

While the surveys revealed very similar measures of stress and hope, the interview data revealed the deeper issues including how much the nature of stress differs in families with FASD children and those with autistic children as well as the very different "hope outlook" of those two groups (one of the beauties of the mixed methods approach) (Watson, Hays, Radford-Paz & Coons, 2013). While the qualitative data would not have been possible without the foundation for focus being laid by the findings of the quantitative data (and some of the details of that data being teased out to look at nuances within that data), it was the collection of the qualitative data that gave deeper and more thorough meaning to the analysis of the surveys and that revealed the many differences between the groups and the layers of challenge that these families face as they look into the futures of their children.

In addition to including this study as a resource on the family dynamic component of autism, it was included as it measured the nature of hope in the outlook of these parents and that impact on their children. As pointed out in a previous article, an inverse relationship between parent stress and child treatment outcomes exists (Ferraioli & Harris, 2012). Additionally, this article points out that a positive relationship exists between parent hope outlook and children's treatment outcomes (Watson, Hays, Radford-Paz & Coons, 2013).

Meta-Analysis of Early Intensive Behavioral Intervention for Children with Autism” (Eldevik et al., 2009), an article that I considered for an earlier assignment, is relevant here as it highlights the importance of proactive parents to find early intervention and it addressed the importance of timely intervention as recommended by some of the information offered by Sequeira & Ahmed (2011) regarding, in detail, the nature of brain development in children on the autism spectrum. Sequeira & Ahmed (2011) reported that children who develop ASD have been observed as having an overgrowth of the corpus callosum and temporal lobe prior to age two. This “initial phase of brain enlargement is followed by both arrested growth then accelerated thinning of the cortex in areas involved in cognition and the formation of emotional memory...” and leads to other issues of “early growth and later regression shown in the amygdala, the structure responsible for adding emotional memory to experiences” (Sequeira & Ahmed, 2011). With the purpose of filling a void in research on this topic and improving upon previous work done in this area by identifying a research-supported model (Early Intervention Behavioral Intervention--EIBI) to more clearly inform “early intervention” models, the authors began with an extensive, broad search for studies, which resulted in 2,150 potential articles for their use. After using a careful selection process to further narrow the 2,150 papers to 9. After obtaining the original data from the authors of each of the nine remaining studies, Eldevik et al. (2009) created a sample group of 297 children; 153 in the EIBI groups, 105 in control groups, and 39 in comparison (eclectic interventions rather than EIBI) groups. The authors then conducted a micro-analysis on the original data in order to measure outcomes relating to changes in intellectual functioning and changes in adaptive behaviors. Although the authors themselves note the challenges presented and the possible weaknesses that resulted from them (a relatively small number of studies used, the overall dearth of studies in this area, other variables that may affect the effectiveness of EIBI versus eclectic interventions such as the expertise of those delivering them, and the possible interface between the two outcomes that they chose to study—intellectual functioning and adaptive behaviors), their attention to detail and the resulting findings not only tell us something significant—that early intervention is key to successful treatment outcomes with ASD children and that EIBI is the only “proven” systematic treatment approach for early intervention for autism.

Although not a study or peer-reviewed article, I include an article from the NESCA website, (NESCA is a private pediatric neuropsychology group practice in Newton, Massachusetts) and another from The International Journal of Yoga Therapy because they remind us that science and research are, at their heart, vehicles to inform clinical practice with not only research participants, but real people. Massachusetts and Oregon are leading the country in practicing mental health professionals who employ MBCT and Yoga therapy as therapeutic approaches or complementary interventions. Hannah Gould, author of “Yoga and Autism; A Rewarding and challenging assignment,” (Gould, 2010) offers a personal glimpse into her practice with one “subject,” a young man in his teens who is on the autism spectrum. Her discussion highlights the complication that arises when the common comorbidity of gastrointestinal illness arises in the life of a person with ASD. Additionally she offers a “boots on the ground” look at the match of a therapy (yoga and meditation) that is not heavily reliant on verbal cues and feedback with a non-verbal ASD person as well as a certain insight into a possible model for delivery of this intervention in a variety of settings. She also captures the human element that researchers sometimes tend to lose sight of when focused on statistical outcomes.

In her article, “Yoga Therapy for Children on the Autism Spectrum,” Jennie Ehleringer (2010) writes to an audience of yoga instructors, therapists and counselors who may lack experience working with ASD children. She offers a detailed best-practices approach to create a model of instruction based on her own experience. Again, this lacks the strength of peer review, but represents real people doing real work and utilizes the author’s special education background as well as the work of other practitioners to create structure in an area where there is to date, very little to be found. She also offers additional resources as well as trainings that might be beneficial to those who seek to offer this type of intervention in a clinical or school setting; the standardization of training for yoga therapy practitioners is another issue that warrants further study.

In their article “Clinical Group Supervision in Yoga Therapy: Model, Effects, and Lessons Learned,” Forbes, Horii, C. V., Earls, Mashek, & Akhtar (2012) address the need for standardized training for those who deliver group services in Yoga Therapy. Although practitioners who wish to practice MBCT have a

definite model to follow through courses designed based on John Teasdale's original work (<http://www.umassmed.edu/cfm/>), the Yoga Therapy community had not yet established a training model to address group delivery. This action-based research article documents the "theoretical framework learning and process themes, and analysis of inaugural group supervision" training needs (Forbes, Horii, C. V., Earls, Mashek, & Akhtar, 2012), adding to work previously done by the International Association of Yoga Therapists (IYAT) for practitioners wishing to conduct one-on-one yoga therapy. Using a series of surveys with a sample of 10 trained participants yoga, the researchers used surveys to collect data on the needs and expectations of such a training program according to the participants. The training was then modeled to reflect this and other data on best practices (Rybak & Deuskar, 2010), and the participants participated in the newly developed 18-month (45 direct group supervision hours) training program, then completed a post-survey and a final interview in the interest of refining the group delivery model (Forbes, Horii, C. V., Earls, Mashek, & Akhtar (2012). This article includes appendices with the surveys designed to collect data as well as documents that resulted from this work.

Building Bridges

The next group of articles looks at the need to build bridges that connect the unfamiliar territory of Yoga Therapy with established institutions: managed medical and mental health care, traditional mental health treatment models and educational entities. In their important article "Building Bridges for Yoga Therapy Research: The Aetna, Inc. Mind-Body Pilot Study on Chronic and High Stress" (Kusnick, Kraftow and Hilliker, 2012), the authors report the "first formal recognition of the potential role of yoga therapy in modern healthcare by an insurance company," (Kusnick, Kraftow and Hilliker, 2012) and begin the important process of bringing an Eastern practice and Western medicine, particularly under the lens of managed care, to the table to talk. Through an unpredictable turn of events, Desikachar-trained yoga expert Gary Kraftsow was invited by Dr. Karen Sherman (UW) to develop a yoga intervention for low back pain, funded by the National Institutes of Health, which led to opportunities for Kraftow to also design interventions for anxiety disorder and other mental health applications. Kraftow then met Mark Bertolini, then CEO and chairman of Aetna, Inc (managed health care giant) who proposed that Kraftow design a workplace stress management program and empirically test its effectiveness in partnership with Aetna, e-mindful, and Duke University (Kusnick, Kraftow and Hilliker, 2012). While the articles does not outline the details of the research, it refers to the study as "successful" and points out the potential for partnerships between the yoga therapy community, academic institutions and modern healthcare systems—a vital next step in the development of Yoga Therapy as an accepted practice. In his article about yoga therapy's role in medical rehabilitation (Taylor, 2012), Dr. Matthew Taylor, Yoga Therapist, supports the viability of these partnerships, pointing out that 40% of the members of the International Association of Yoga Therapists (IYAT) are professionals with specializations in one or more fields of Western medicine.

Another bridge to be built is within the community of mental health practitioners. The divide between psychiatrists, PhD psychology providers and Master's level Licensed Professional Counselor providers had been widely discussed. It is also important to note the resistance of many mental health providers to new interventions. However, when need arises, people become more open-minded, and new interventions that support or prepare clients for successful outcomes and treatment approaches that take a more spiritual approach to mental health (Young, J., Wiggins-Frame, M., & Cashwell, C. S. (2007) become more accepted, if they show evidence for filling that need. In her article, "Bridging the Practices of Yoga Therapy and Behavioral Health Service Delivery for Adolescents," Michelle Walsh begins with the process of forming a collaboration between Cognitive Behavioral Therapy and Yoga Therapy. Recognizing the common issue of CBT and 12-step programs (both rooted in talk therapy) not always being developmentally appropriate or easily accessible for children and adolescents, she discusses a model that she created for the Massachusetts Department of Public Health (MDPH) to answer this need for interventions that can engage children and adolescents. The goal of her work with the MDPH was to brave the skepticism of mental health and substance use disorder professionals to achieve a systems-level change and implement the strategies of Yoga Therapy across the MDPH state-funded system of care for those who could not afford complementary alternative mental health care by illustrating how the techniques of yoga therapy deepened adolescents' ability to access and apply the skills taught through the more traditional mental approach of CBT (a therapeutic approach also traditionally used with ASD clients) (Walsh, 2012).

“Finding the points of intersection and communicating the value of yoga in a nonsectarian way was crucial to the success of this process” (Walsh, 2012). Although details of the process and its evaluation were not included in this article, the author described the process as “successful” after a three-year process of integration and encourages the community of yoga therapists and those who understand the benefits of this intervention to continue adding to the canon of studies to further this process of acceptance of Yoga Therapy (Walsh, 2012).

One way for this to happen is for therapists who employ yoga and mindfulness into their practice to begin nurturing a more public presence, and the public schools may be a good place to start. In their article “Efficacy of the Get Ready to Learn Yoga Program Among Children with Autism Spectrum Disorders: A Pretest-Posttest Control Group Design,” Patten-Koenig, Reen and Garg begin to evaluate one bridge with the school setting and add to the collection of quantitative studies that will support Yoga Therapy as an evidence-based therapeutic approach. This program evaluation study uses a convenience sample drawn from a large urban public school, and, after collecting all of the necessary board approvals and parent consents, the researchers recruited the members of four classes (24 students) as the treatment group who received yoga instruction for 16 weeks and four classes of students (24 students) for the control group, who engaged in their standard morning routine for 16 weeks. The Vineland Adaptive Behavioral Scale – II (VBS 2) was completed on each child as a pretest to establish cognitive functioning of each participant prior to intervention and confirm that the groups were comparable in adaptive functioning. Additionally, the researchers ensured that the diversity of the students so the findings would be generalizable to a larger population of ASD students (Patten-Koenig, Reen and Garg, 2012).

The authors used the Aberrant Behavior Checklist (ABC) – Community to assess challenging behaviors as a pretest and posttest completed by the children’s teachers and parents. Participating teachers were given a two-and-a-half hour inservice on a standardized yoga program and supervised by the authors (occupational therapists) and yoga therapists for the first three days through classroom observation and then at intervals throughout the 16 weeks to ensure fidelity to the yoga model. After the ABC posttest, the researchers conducted an ANOVA to compare the difference between groups. Using Cohen’s *d* value, they found a moderate effect for the total behavior scores with scores approaching statistical significance on the hyperactivity/noncompliance scale in the treatment group, while there were no changes in the scales of the control group (Patten-Koenig, Reen and Garg, 2012). Two possible limitations of the research include the authors’ observation of the possibility of observer bias, as the teachers doing the pre and post tests were not blind to the intervention (Patten-Koenig, Reen and Garg, 2012) and another limitation that I note—that this included yoga movement only intervention (asana) and not meditation or mindfulness yoga intervention, an omission that has been discussed in other studies as lowering positive outcomes. However, this study does show both a moderate positive outcome and create a model for future researchers using these scales and methods.

Another study that used similar methods as Patten-Koenig, Reen and Garg (2012), by Rosenblatt, et al. (2011) used the Behavioral Assessment System for Children, second edition (BASC 2), which measures some of the core features of autism, and the ABC Checklist (used by the above authors) in a non-school setting. These authors included breathing techniques, asana postures, music, dance and yoga/meditation/relaxation in their model as interventions for a study group of 24 ASD children. After the post test, the researchers found “robust changes” on the BASC- 2 with “unexpected findings:” that the ‘Atypicality’ (a core feature of autism) Scale scores and Depression Scale scores (another core feature of autism) of the BASC2 reflected changes of statistical significance for 5-12 year-old children (Patten-Koenig, Reen and Garg, 2012). The article also points to the results as indication that patients with ASD may have a greater receptivity to the program’s focus on movement and sound (as it is easy to follow for non-verbal ASD children) and plan to explore modification that will make this approach more accessible to children under five and over 12 years of age. The real “take away” from this article is the seemingly small but significant shift away from using measures that only look at autism through an overarching lens (as if all people on the autism spectrum share an entire set of characteristics) to instruments and approaches that begin to “tease apart” the core features of autism and look at yoga interventions as they are able to impact those sub-characteristic of this very complex mental health challenge.

Approaching Research into Autism through a Core-Features Lens

Following that strand of thought, we will look at articles that may or may not address specifically “autism” but address some of the core features of autism and some of the common comorbidities. Peck, Kehle, Bray and Theodore (2005) began looking at yoga as an intervention for children with attention problems (also a core feature of autism) long ten years ago. Using a quantitative model, the authors selected a sample of ten elementary school student with attention problems (not diagnosed with ADHD) across first, second, and third grades on the recommendation of the school psychologist as having documented attention problems. A multiple baseline was created for the three grade levels with a follow-up phase that included ten children and composite controls. Time on Task was deemed the dependent variable (determined by coded observations of two observers who displayed an interrater reliability of 91%) using the Behavioral Observation Form (BOF, 1993) and the school-psychologist-led yoga intervention was the independent variable. Additionally, the students completed a social validity questionnaire based on Bray and Kehle’s 1996 index instrument to measure how much the children liked engaging in the yoga fitness exercises (mainly postures—Giam’s Yoga Fitness for Kids DVD—were included in the practice—but some attention to breath and guided relaxation were also included).

The social validity scores of all three grades were high—the children liked the yoga activity. Using a Cohen’s effect of .20 equals small, .50 equals moderate and .80 equals large effect, the researchers found that the effect sizes for each grade level group ranged from moderate to large upon completion of the intervention and remained moderate at follow up.

Anxiety and depression are also common core features (or more specifically, comorbidities) of autism. Edenfield and Saeed (2012) compiled a review of literature on this topic that may serve well for use in future micro-analysis that shifts the focus of analysis of the data to these conditions as they apply people on the ASD spectrum. Another review of literature that focuses on yoga as a complementary treatment for depression and anxiety (Forfylvow, 2011) examines clinical findings on breath work, physical postures, and meditation, all of which indicate positive outcomes at impressive rates and may serve the same purpose.

Taking this focus on core features of autism to another level, two articles that examine the effect of mindfulness, yoga and meditation on brain function, neuroplasticity and hormone release centers offer the most convincing, quantitative, objective outcomes to date. Although the others of neither article chose autism per se as their focus, they did choose to study characteristics that are included in the core features of autism. The first, “Mindfulness Starts With the Body; Somatosensory Attention and Top-Down Modulation of Cortical Alpha Rhythms in Mindfulness Meditation” (Kerr, Sacchet, Lazar, Moore & Jones, 2013) looks issues of neural networks, amygdale response, rumination, spatial attention, metacognitive abilities and self-processing in the mid-line cortical areas (all connected to the core features of autism) in the light of mindfulness and meditation interventions and through the lens of the effect of those practices on alpha rhythms modulation. The research offers evidence that mindfulness and meditation enhance top-down alpha modulation for positive outcomes in body awareness, attention, cognition, managing chronic pain, regulating emotions, and preventing depression. The authors further hypothesize the generalizability of these finding to other sensory modalities. Similar findings on depression, ADHD and cognitive functioning were found by Balasubramaniam, Telles and Doraiswamy (2013) in their article “Yoga on our Minds: A Systematic Review of Yoga for Neuropsychiatric Disorders.”

Related Articles

Another study that considered one of the core features of autism, body awareness (or lack thereof) is considered in “The Relationship of Yoga, Body Awareness, And Body Responsiveness To Self-Objectification And Disordered Eating” (Daubenmier, J., 2005). Again, this research was not conducted with a sample of people on the autism spectrum, but the results yielded a Univariate analysis that study participants reported significantly more body awareness, responsiveness and satisfaction than did the groups that participated in regular exercise or the baseline comparison groups (Daubenmier, J., 2005). Body awareness is also a core feature of autism.

A qualitative, “Invisibility and Insubstantiality in an Anorexic Adolescent: Phenomenology and Dynamics” (Brady, 2011) is another example of “real life” application of research-based interventions with adolescents. Although it does not address either yoga therapy or autism, it is included because it provides a solid qualitative model for working with adolescents and also has a unique single-subject approach that draws our attention to the fact that although many disorders and diagnosis have much in common, we must also take the time to recognize that each person is uniquely individual and that practitioners should not “lump” people together under a diagnostic heading and assume that all characteristics of a disorder are present or that they all stem from the same beginnings. This article made me reflect that children with whom I have worked as a teacher and program administrator who may have shared core characteristics (or may not) but reminds me that etiology of peripheral symptoms and comorbidities may stem from other factors in their lives such as attachment issues, dysfunctional family members (beyond the normal stress experiences by most ASD caregivers) or other issues that are not instantly recognizable. The edict ‘do not assume’ rings true and clear and was the secret to Brady’s successful treatment of this young woman. This is yet another thing to keep in mind as I continue my work in education and when I move into the world of mental health practice.

The last article in this review, “YogaHome: Teaching and Research Challenges in a Yoga Program with Homeless Adults” (Davis-Berman & Farkas, 2012) helps anyone working with people on the autism spectrum take a “long view” by reminding us that successful outcomes for ASD clients are not the norm at this time, with only 15% of autistic people successful holding jobs (<http://www.autismdailynewscast.com/are-people-with-autism-at-a-higher-risk-for-homelessness/6784/laurel-joss/>). The issue of homelessness and autism have a significant overlap, with one study by Professor Colin Pritchard at Bournemouth University reporting that that 9 out of the 14 “entrenched rough sleepers” in his sample “could be categorized along the adult autistic spectrum and 7 of the 14 had been formally diagnosed with an autism spectrum disorder” (<http://www.autismdailynewscast.com/are-people-with-autism-at-a-higher-risk-for-homelessness/6784/laurel-joss/>). Additionally, the challenges faced by Davis-Berman and Faraks (2012) in the course of their attempt to use quantitative methods in their research highlights that qualitative methods also have value and, in some cases, are simply more possible to use and more fruitful in terms of drawing meaningful data. Although the authors had to abandon their original pre-test/post-test design because of characteristics common in the homeless population, the interviews that they conducted with the people who stayed in the program will continue to add to the depth of this ongoing study. The authors themselves point out that the greatest impact of the study may be the affect that it has had on them as researchers, reminding them (and us) to constantly challenge one’s own assumptions (Davis-Berman and Faraks 2012). As a future practitioner, this article reminds me of *one* fate possible for the children with whom I hope to work in my future practice, thus underscoring the need for responsible research and informed clinical interventions to ensure that this is only *one* potential outcome. Reading this also gives me conviction that, in ten or fifteen years, statistics like those reported by Pritchard, above, can only change if our approaches to treatment and intervention for people on the autism spectrum also change.

Application to Future practice, Observations, Trends and Ethical and Legal Considerations

This assignment has gone long, and I have embedded much information about how this information will inform my future practice, cultural implications, limitations of research, and legal and ethical considerations as I have reviewed particular articles, but I will highlight some particular points of interest here. The emerging research into brain function, neurology and hormone function holds much promise when it comes to understanding the underlying physiological drivers of many core features of autism. I look forward to learning more and perhaps collaborating to conduct research in the manner of those articles. To do this, I will need to learn much more than I know of the details of the brain, etc. Additionally, the research for this review has helped me better understand the training that I will need beyond my LPC certification. I am already a certified yoga teacher, but gaining more in-depth training, specifically in Yoga Therapy and the eight week Mindfulness Based Cognitive Therapy model, will be necessary. The legal and ethical implications of working with a population of disabled minors seems fraught with possible pitfalls. For this reason, careful attention to obtaining board approval for research, parent permission, and ensuring client and/or guardian understanding of the nature of the research and interventions will be paramount to

staying on the right side of the ACA Code of Ethics (2005), but it is possible to do this work well, legally, and ethically. From a clinical standpoint, the same foibles present themselves, but the need to continue conducting research based on clinical applications is paramount. The completion of quality research (which is constantly repeated by the authors of the studies that have been reviewed here) will be the single most important guiding factor going forward. New interventions need strong evidence to be considered ethical clinical practice. This, too, will be my goal.

It was tempting to order the articles reviewed in chronological order, as that would have shown a trend in how much ground has been covered in research focused on this emerging therapeutic approach over that past ten years, but it was not the best choice for the logical procession of this paper. The quality, depth and breadth of studies over the past decade speaks to the recognition of the medical and mental health community of the need for new models-- wellness models that provide better, more affordable treatment options to clients. The type of research being done also points to a broader scope of Yoga Therapy applications and a deeper understanding of the nature of autism and its physiological characteristics.

Along with the trend of authors repeatedly highlighting the need for more research, I was surprised to find that Qualitative or even Mixed Methods methodology was difficult to find. I understand the industry prejudice against qualitative (soft) data collection, but I also think people are missing a depth and richness of opportunity by not including qualitative methods in at least a Mixed Methods approach. In the future, I plan to use a Mixed Methods approach to deepen research in the areas that I have pointed out are of particular interest to me as a researcher. I heartily recommend future collaboration between the medical community and the mental health community to join forces to better understand how a deeper understanding of autism from a structural/molecular/hormonal standpoint can inform best practices on the part of both medical doctors and mental health care providers. So often people think in "silos" and only believe in the value of linear thinking. Taking the time and opportunity to think divergently enough consider the deep connectivity between medical science research potential and mental health application and interventions would be time well spent.

Much information concerning my learning experience has been interwoven into the discussion of the various articles above and was presented in my introduction many pages ago, but it seemed necessary to explain that process before walking through the articles. I think that I will find it difficult to properly explain the profound effect that this course and the opportunities provided by the well-designed and thoughtful assignments have had on my learning and my plans as a future counselor (and on my upcoming practicum). I would like to note that this has not always been the case. Many courses are so heavily focused on work to prepare those who plan to become school counselors that I have at times felt that the Mental Health students were an afterthought. Not so with this course. The freedom to find our own articles or choose from a list of quality articles led to a process that seemed to unfold before me as I dove more and more deeply into the "weeds" of research that impacts the population of children with whom I plan to work. This resulted in a deep synthesis as I came to realize that, as we come to better understand the underlying nature/mechanisms of autism from a cognitive and neurological standpoint, much research being done and respected in the areas of neuroscience and brain function can, with very small effort and without over-generalization, become research that may open up many avenues of treatment for ASD clients and also garner support for yoga, mindfulness and meditation as evidence-based interventions for people on the autism spectrum. I feel much more prepared as a consumer of research, and, barring some gaps in my knowledge of what statistic to best use for what purpose, I feel much more prepared as a future researcher. Most of all, I feel hopeful--hopeful for children on the autism spectrum; hopeful that I may be able to bring something new to the table with a practice that includes all (willing) family members, and hopeful that this emerging intervention that I believe will be so beneficial to so many will soon become an respected, accepted, solid, evidence-based treatment option or complementary intervention option.

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