

Mental Health Benefits of a Service-Learning Group Drumming Between College Students and Children with Autism Spectrum Disorder

Lyn Gorbett Litchke
Ricardo Dorman
Trason Aaron Willemin
Ting Liu

Texas State University

Introduction

The prevalence of mental health problems among college students is on the rise, thus placing an increased demand on college counseling centers to address the growing number of students seeking treatment (Holland & Wheeler, 2016). College students report experiencing a considerable degree of stress. The American College Health Association's National College Health Assessment (NCHA) found that 53% of students reported feeling either "more than average" or "tremendous" levels of stress in the last 12 months. About one-third of U.S. college students had difficulty functioning in the last 12 months due to depression, and almost half said they felt overwhelming anxiety in the last year, according to the 2013 NCHA, which examined data from 125,000 students from more than 150 colleges and universities (American College Health Association, 2015).

Given that many counseling centers find it difficult to meet the high demand for mental health services (Gallagher, 2014; Simon, 2017), alternative ways of delivering services to students are needed. University counseling centers are employing new ways to meet these demands by offering not only traditional individual and group counseling, but also newer online counseling opportunities (Gallagher, 2014; Nguyen-Feng, Greer, & Frazier, 2017) and alternative experiential treatment options (Morgan, 2017). However, even with more options, there are still increasing numbers of students who struggle with seeking treatment for their mental health issues due to stigma associated with seeking help (Holland & Wheeler, 2016).

Abstract

Growing numbers of universities are developing service-learning community music-making interventions. However, there has been little research into their efficacy and effect on overall mental health for students. This study explored whether 4-weeks of dyadic group drumming could improve depression, anxiety, stress, social resilience, and enjoyment among 19 college students partnered with children with Autism Spectrum Disorder (ASD). A paired sample t-test revealed significant findings on two subscales of the Perceived Stress Scale: 1) handling unexpected events, $t(18) = 2.535$, $p = .021$ and 2) controlling important life experiences, $t(18) = 2.364$, $p = .030$. Documented expressions by the students in the summative reflection noted: expressed joyfulness in the experience with their child and musicality of program; personal growth; stress reduction; and professional impact on their future careers. Overall, these findings indicate that a service-learning group drumming experience between college students and children with ASD leads to enhanced psychological states. Perhaps adding service-learning projects of this nature to college courses can alleviate the growing number of mental health issues faced by today's college students. It may also provide universities with unique opportunities to offer complementary service-learning as an additional form of non-stigmatizing therapy, lessening the demand on counseling services.

One option that can help in reducing the stigma of seeking out mental health treatment may be found in service-learning, where as part of a college course students serve others in the community (Haddack, et. al., 2013). Randy Moffett stated that, "Many people confuse service-learning with volunteerism, but in reality there is a strong academic component involved with service-learning." (as cited in Moulton & Moulton, 2013). Nevertheless, volunteering and service-learning seek to balance the benefits to the student and the community partners. Research shows that helping others can aid in wellness and recovery. Known as "the caring cure," Jenkinson, et al. (2013) reviewed 40 studies from the past 20 years on the link between volunteering and health, and found that volunteering is associated with lower depression, increased well-being, and a 22% reduction in risk of dying early. Researchers need to continue to explore innovative ways to expand services and work with faculty to incorporate aspects of mental wellness in the classroom by adding a service-learning component. Yet, little is known about the benefits that college students derive from their experience within the context of service-learning (Novotney, 2014).

Another, intervention that has demonstrated improvement in symptoms and reduced severity of conditions related to mental health is music, in particular group drumming (Fancourt et al., 2014). More specifically, after six-weeks of group drumming, results showed significant improvements in depression, social resilience and mental wellbeing among participants. In addition, at-risk adolescents who engaged in a drum circle reported feeling better about themselves and that the group helped them to feel more open. Half of the students reported that the group might have helped them with stress, anger and lack of motivation, as well as self-confidence (Snow & D'Amico, 2010). This type of alternative experiential intervention may enhance treatment seeking and engagement among college students Pederelli, et al., (2015). Interventions that enhance recovery, such as group drumming, can alleviate chronic stress, promote positive mental health and coping, and interrupt negative long-term health deficits (Joseph & Linley, 2008).

There is scarce research specific to group drumming in the context of service-learning aimed at enhancing the mental health and wellbeing of college students. Thus, the goal of the present study was to assess the efficacy of four-weeks of dyadic group drumming as a form of service-learning between college students paired with children diagnosed with Autism Spectrum Disorder (ASD) as part of a summer college course. We hypothesized that by helping others, college students would experience a reduction in perception of anxiety, depression and stress, while improving resiliency and enjoyment.

Method

Participants

A total of nineteen students participated in the study. Fourteen students were enrolled in a summer graduate Recreation Therapy (RT) course. Ten of those students were RT majors, two were Recreation Administration majors, and two were Honors College students. The five remaining students were undergraduate RT students enrolled in an independent study course. Of the nineteen students, thirteen were females and six were

males. Participants varied in age ranging from 19-42 years of age ($M = 27.4$ years). There were two African American students, seven Hispanic students, and ten students were Caucasian. Participants were given a detailed description of the study before being asked to sign an informed consent approved by the Institutional Review Board. To be eligible for this study, participants needed to attend a minimum of six of the eight drumming sessions over the four-week period. Participants completed five pre and post self-assessments and a final reflection note to document any changes with the intervention.

Procedures

The primary investigator (PI) utilized assistance from fourteen Graduate Student Mentors (GSMs), and five Undergraduate Camp Counselors (CCs) all of which were college students who volunteered for the study. All GSMs and CCs attended an eight-hour orientation on strategies for working with children with ASD and the dyadic group drumming protocol. The PI trained the GSMs in program planning and implementation, therapeutic best practice approaches towards facilitating recreation programming with participant with ASD, as well as instruction on collecting data with the instruments used in this study. GSMs collected periodic data from child observations in both a pre-test–post-test all eight sessions, as well as session-specific collection of child data before and after each drumming intervention session. The PI facilitated the sessions with two GSMs all certified Drumtastic® Instructors. Drumtastic® is an evidence-based “All inclusive-no participant left behind” program that applies fitness, drumming, music and educational concepts designed to improve social, emotional, physical, and cognitive health, and well-being (Drums Alive, 2017).

All nineteen participants were assigned one child each with ASD to be their drumming partner. The Drumtastic® took place twice a week for one-hour for a total eight sessions at a four-week camp for children with ASD. The roles of the GSMs and CCs were to monitor behavior, enhance socialization skills, foster teamwork, and create a positive sense of social and emotional wellbeing without discouraging participation in individual or group activity. GSMs and CCs also assisted in the movement, drumming, and rhythmical model by assessing proper body mechanics and rhythmic timing.

The primary intervention was comprised of three main areas of the Drumtastic® curriculum. The first area focused on implementation of the multi-modular protocols that combined physical education, fitness, drumming, music education, mindfulness, and relaxation strategies. Next, we accelerated learning through movement and rhythm exercises that supported and reinforced “Motor and Sensory Memory” through targeted and continuous incorporation of multi-sensory inputs (Sight, Sound, Smell, Touch, Emotion) to elicit immediate and measurable auditory, visual and physical feedback. Finally, we facilitated engagement of productive physical and cognitive activities to improve executive functioning and provide neural plasticity.

Drums Alive® (2017) provided each participant with an exercise stability ball (also referred to as a “drum”), a large bucket to hold the ball in place during the exercises;

and two pair of drumsticks (one set adorned with scarfs and one without). Drums were placed throughout the room in a four person “+” pod formation to accommodate all the participants and their GSMs and CCs to create a dyadic within-group drumming experience. Dyadic drumming involves the biological concept of rhythmic entrainment, whereby two rhythmic processes interact with each other in such a way that they adjust towards and eventually “lock in” to a common phase and/or periodicity (Trost et al., 2014).

Each one-hour Drumtastic® session consisted of seven sections. Section one was a five-minute warm-up that included fine motor dexterity exercises using drumsticks while children, GSMs, and CCs lightly bounced as they were seated on their exercise ball. Section two, consisted of ten-minutes of drumming and movement exercises on the large balls while simultaneously singing familiar songs and chants. The third section involved ten-minutes of cognitive and rhythmical clapping games using the various drum equipment and visual cue cards. The fourth section was a five-minute break for recovery with participants choosing from three resting positions. The fifth section was fifteen-minutes of drum and dance choreography set to music that was selected by the children. The sixth section was ten-minutes of yoga relaxation exercise including deep breathing and receiving a carefully monitored massage using lavender scented oil. Section seven, the final section, was a cool down period of five-minutes rhythmical Kirtan Krya chanting and positive affirmations statements.

Instruments

Our primary mental health outcomes were measured pre and post the four-weeks of Drumtastic® intervention. First, the Hospital Anxiety and Depression Scale (HADS) screened for multiple forms of depression and anxiety (Bjelland, Dahl, Haug &, Neckelman, 2002). Results were interpreted into three categories: Normal = 0-7; Borderline abnormal = 8-10; Abnormal = 11 - 21. The scale consisted of fourteen questions measuring symptoms of anxiety and depression based on the respondent’s feelings over the previous week.

Second, the Perceived Stress Scale (PSS) created in 1983, measured individual perceived stress levels and social function over the last month (Fancourt, et al., 2016). The PSS consisted of ten questions, each question used a five choice Likert Scale beginning with Never (0), almost never (1), seldom (2), fairly often (3) to very often (4). The PSS results were categorized into low = 0-13; moderate = 14-26; high = 27-40.

For our third outcome measure, the Connor Davis Resilience Scale (CDR) measured the resiliency of the participant under a variety of stressors (Fancourt, et al., 2016). Participants indicated which statement pertains to them in five categories ranging from not true at all to nearly true all the time. For example, statements such as, “ability to adapt to changes in one’s life,” to “overcoming obstacles that arise when trying to obtain goals.”

Fourth, the Physical Activity Enjoyment Scale (PACES) measured the level of enjoyment of a physical activity (e.g. dyadic group drumming) through eighteen questions on a bipolar seven-point scale. PACES was completed after the first Drumtastic® session and after the last intervention to determine level of enjoyment reached (Kendzierski & DeCarlo, 1991).

Finally, one of the methods recommended for service-learning projects in higher education is to assess effectiveness through the use of reflective writing (Moulton, & Moulton, 2013). Thus, participants were instructed to write a final reflection at the end of the eight Drumtastic® sessions based on their entire experience as it related to personal growth, changes in regard to mental health, and gaining professional experience in the field.

Data Analysis

Descriptive statistics were used to analyze college students performance on CDR, HADS, PSS, and PACES overall scores before and after the eight-session of intervention. A Likert Scale was used to measure all raw scores from each instrument measured. Paired sample t-tests were conducted on the CDR, HADS, PSS, and PACES scores to examine the significant differences between pre-and post-tests. Results were considered significant when alpha value was less than .05. Effect sizes (ES) was calculated for practical significance using Cohen's *d* (Cohen, 1988).

Results

Descriptive statistics showed that college students had higher overall scores on the post-test when compared to their pre-test scores on CDR, HADS-Anxiety category, PACES, and on the PSS total/subscales. The PSS total scores showed 8 out of 19 college students self-reported moderate stress levels pre and post. One additional student diagnosed with PTSD had high levels of perceived stress that was reduced to moderate post drumming. According to the HADS, the majority of students remained in the normal range pre and post.

The paired sample t-test revealed that college students scored significantly lower on the PSS post-test in subcategories of Unexpected, $t(18) = 2.535$, $p=.021$ and Important, $t(18) = 2.364$, $p=.030$ when compared to their pre-test scores. College students decreased 28.6% in Unexpected and 37.5% in Important in their post-test (see Figure 1). The effect sizes (ES) describing the college students pre-test and post-test differences were large on Unexpected (ES = .58) and Important (ES = .59). The moderate ES results indicate that the true effect of the pre-test and post-test differences in the populations may be moderate. These findings indicated that drumming activities improved college students' stress level related to being upset about something happening unexpectedly in their lives, and in the inability to control important things in their lives after eight-weeks of intervention.

Twelve of the nineteen students completed the reflection assignment. Nine of the participants spoke of "joy" experienced with their child camper and musicality of program. Four made statements about personal growth. Three shared reduction in

stress and one participant with Post Traumatic Stress Disorder (PTSD) shared a reduction in anxiety. Four spoke of the professional impact of the service-learning on their future careers.

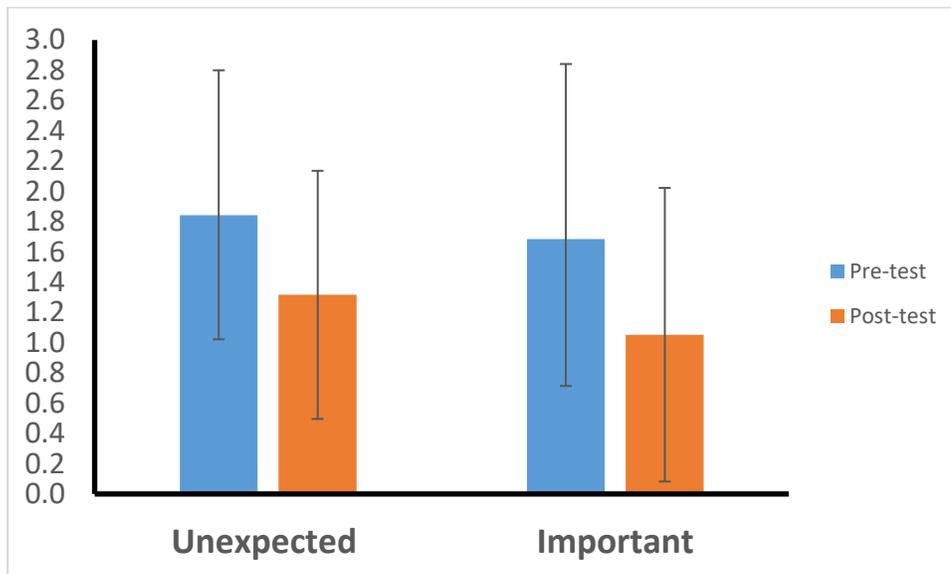


Figure 1. Perceived Stress Scale two Subscales. College students scored significantly lower on Unexpected and Important after the eight-week intervention.

Discussion

This study explored whether a dyadic group drumming service-learning intervention could improve mental health over four-weeks in college students when paired with a child with ASD. We hypothesized that across the four-week intervention there would be a decrease in symptoms of stress levels, depression and anxiety, and improvements in social resilience and overall enjoyment of the experience. This was demonstrated by overall higher scores in the post-test when compared to pre-test scores on CDR, HADS-Anxiety category, PACES, PSS total score/subscales. Furthermore, significant improvements were found on PSS subscales of control over important life factors and ability to handle unexpected life events. In addition, reflective statements provided evidence of a joyful experience that impacted personal growth, positive mental health outcomes, and professional development.

Our findings are comparable with previous service-learning studies involving the impact on stress. Haddock et al. (2013) found that college student mentors paired with at-risk youth mentees in a service-learning college course reported having increased confidence in their ability to manage challenges and stressful situations. We also found an improvement in confidence, optimism, coping skills in overcoming stressful situations. Reflective statements indicated reduction in stress by the college students. For example, "It provided stress relief." "I also felt a decrease in my stress levels during the Drumtastics® intervention."

Furthermore, our results are consistent with other researchers with regard to stress reduction and the impact of group drumming (Blankett & Payne, 2005; Snow & D'Amico, 2010; Winkelman, 2003). More specifically, Winkelman (2003) reported that drumming helped participants with substance abuse disorders calm down and deal with their high-stress lives. In addition, Snow and D'Amico (2010) found that a majority of at-risk high school students reported that the group drumming may have helped them with stress, anger and lack of motivation, as well as self-confidence. Finally, Blankett and Payne (2005) results coincided with ours, in that after seven-weeks of one-hour sessions of *HealthRhythms* drumming, participants in a substance use program considered the intervention to be particularly useful for stress reduction, emotional release, and provided a positive social group experience. Measuring perceived stress was vital to our study since students' perceptions of stress could affect their involvement and ability to interact successfully with their child with ASD. Furthermore, higher levels of stress are associated with avoidance coping strategies and increased students' depression which can often lead to decreased use of counseling services (Dyson & Renk, 2006). Overall, drumming has a positive impact on stress reduction, therefore this type of innovative service-learning may aid in providing a complementary experiential treatment option for university counseling centers.

A second positive finding of our study was that social resilience and anxiety showed a trend for improvement after eight 60-minute sessions over four-weeks. Our dyadic group drumming protocol and findings are similar to a recent study by Fancourt et al. (2016), who found that after six-weeks of group drumming there were significant increases in social resilience and a decrease in depression. More importantly, after ten weeks, there were significant improvements in social resilience and depression, and anxiety achieved significance. Moreover, all three variables remained significant at three-month follow up. Indicating that ten 90-minute sessions of group drumming involving call and response, rhythmic patterning and free improvisation techniques can have a lasting impact on mental well-being. Perhaps, group drumming should be considered by university counseling centers as a viable supplement for supporting college students' mental health status. In our study, social resilience and anxiety did not reach significance yet trended for the positive, with no decrease in depression. Perhaps it was that our study was shorter in duration, session length, and total number of sessions.

Enjoyment of the dyadic group drumming partnership in our study did show promising results according to the PACES and written participant reflections. Researchers have found that drumming induces relaxation and enhances theta-wave production and brain-wave synchronization. Drumming produces pleasurable experiences, enhanced awareness of preconscious dynamics, release of emotional trauma, and reintegration of self. It also creates a sense of connectedness with self and others, and drumming entrains the brain and stimulates pleasurable feelings (Winkelman, 2003). In a study by Kaplan (1999), short-term group drumming showed significant changes in mood and positive effects on cohesiveness and rhythm perception of undergraduate college students. Reflective statements from our study supported the positive experiences enjoyed by the college students. One student stated, "I was positively overwhelmed with

joy.” Another student wrote, “I want to spread and share the feeling of uninhibited joy.” Also expressed in reflective statements, “I personally enjoyed the challenge.” “Every day after camp I was noticeably happier and looking forward to the next time meeting with my child.” In essence, work with group drumming embraces the idea of fostering community expression via the joy of making music and the honoring of each individual within the group as an important contributor to the whole (Hull, 2006; Stevens, 2003).

Important implications of combining service-learning and group drumming philosophies enhances adaptive coping methods that students can utilize. This also may promote the use mental health counseling services and perhaps reduce the stigma of seeking help (Holland & Wheeler, 2016). Decreasing stigma among students is essential. The group drumming model of hands-on learning-by-doing engages students in a collective learning process that is expressive musically, teaches basic drumming skills, encourages initiative taking and leadership skills. Students are challenged to learn and to grow as individuals within a supportive environment (Hull, 2006; Stevens, 2003). The idea of service-learning in a collaborative group drumming process engages students to utilize knowledge learned in the classroom and apply it in addressing community mental health needs (Haddock et al., 2013). In addition, this creates a sound-based service-learning win-win situation for university and community persons in need (Fancourt et al., 2016). Encouraging student reflection affirms this win-win situation as noted in our study. “The feeling of playing together, being a part of something larger than an individual, contributing to a powerful and beautiful sound, and being emotionally moved and healed by that experience. I was excited to see how this feeling would translate outside this setting.”

A few elements of this study limit the extent to which the study findings can be generalized to other populations and contexts. First, the sample was made of current graduate students in a summer course, a convenience sample. Convenience samples often have similarities in that, participants are usually from the same geographical area, or have similar socioeconomic backgrounds. Ethnicity and gender also may affect overall data if these are groups are very similar (Emerson, 2015). In addition, summer classes are generally shorter, four-weeks of instruction compared to a normal sixteen-weeks semester, resulting in a limited length of time to compile data from each GSM and CC. This study was also limited by access to follow-up research on the residual or lingering effects described by participants. One important factor in resultant trends in research, especially in service-learning in higher education, is to understand the lasting impact on student retention and successful academic career culminating in graduation. “Therefore, experiential education opportunities have the potential to assist college students with a variety of personal growth opportunities that may enhance both academic and interpersonal functioning” (Morgan, 2017. p. 277).

Conclusion

In conclusion, this study demonstrates that group drumming can reduce some symptoms of stress and provide benefits for anxiety, social resilience, and enjoyment for these college students. Since college students experiencing more stress are less likely to use counseling services (Dixon & Kurpius, 2008; Rosenthal & Wilson, 2008;

Yorgason, Linville, & Zitzman, 2008) it is important that university counseling centers partner with faculty to provide non-stigmatizing complimentary therapies that show a positive impact on mental health. Future research may wish to measure the impact of a service-learning group drumming on academic success and retention rates. We believe our research lays the groundwork for future investigations on student motivations related to service-learning and augment use of counseling services.

References

American College Health Association. (Spring 2015). *American College Health Association-National College Health Assessment II: California State*. University Channel Islands Executive Summary. Hanover, MD: American College Health Association.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: An updated literature review. *Journal of Psychosomatic Research, 52*(2), 69-77. doi:10.1016/S0022-3999(01)00296-3.

Blackett, P., & Payne, H. (2005). Health rhythms: A preliminary inquiry into group drumming as experienced by participants on a structured day service programme for substance-misusers. *Drugs: Education, Prevention and Policy, 12*(6), 477-491.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Academic Press.

Dixon, S. K., & Kurpius, S. E. R. (2008). Depression and college stress among university undergraduates: Do mattering and self-esteem make a difference? *Journal of College Student Development, 49*:412-24.

Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: Depressive symptoms, stress, and coping. *Journal of Clinical Psychology, 62*:1231-44.

Drums Alive. *Drumtastic® Program for Educators* (2017). Retrieved from <https://www.drums-alive.com/programs/new-drumtastic-program-for-educators>

Emerson, R. W. (2015). Convenience sampling, random sampling, and snowball sampling: How does sampling affect the validity of research? *Journal of Visual Impairment & Blindness, 109*(2), 164-168.

Fancourt, D., Perkins, R., Ascenso, S., Carvalho, L. A., Steptoe, A., & Williamson, A. (2016). Effect of group drumming interventions on anxiety, depression, social resilience and inflammatory immune response among mental health service users. *PLoS ONE, 11*(3): e0151136. doi:10.1371/journal.pone.0151136.

Gallagher, R. P. (2014). *National survey of college counseling centers*. American College Counseling Association (ACCA) Publisher: The International Association of Counseling Services, Inc. Monograph Series Number 9V 54 p.

Haddock, S., Weiler, L., Krafchick, J., Zimmerman, T. S., McLure, M., & Rudisill, S. (2013). Campus corps therapeutic mentoring: making a difference for mentors. *Journal of Higher Education Outreach and Engagement*, 17(4), 225-256.

Holland, D. & Wheeler, H. (2016). College student stress and mental health: Examination of stigmatic views on mental health counseling. *Michigan Sociological Review*, 30, 16-43.

Hull, A. (2006). *Drum circle facilitation: Building community through rhythm*. Santa Cruz, CA: Village Music Circles.

Jenkinson, C. E., Dickens, A. P., Jones, K., Thompson-Coon, J., Taylor, R. S., Rogers, M., ... & Richards, S. H. (2013). Is volunteering a public health intervention? A systematic review and meta-analysis of the health and survival of volunteers. *BMC Public Health*, 13(1) 773.

Joseph, S. & Linley, P.A. (2008). *Trauma, recovery, and growth: Positive psychological perspectives on posttraumatic stress*. Austin, TX: John Wiley & Sons.

Kaplan, C. D. (1999). *The short-term effects of small group hand drumming on mood, group cohesiveness and rhythm perception (Doctoral dissertations)*. Retrieved from AAI9949659. <https://opencommons.uconn.edu/dissertations/AAI9949659>

Kendzior, D., & DeCarlo K., J. (1991). Physical activities enjoyment scale: Two validation studies. *Journal of Exercise and Sport Psychology*, 13, 50-64. doi: 10.1123/jsep.13.1.50.

Morgan, B. M. (2017). Stress management for college students: An experiential multi-modal approach. *Journal of Creativity in Mental Health*, 12(3), 276-288. doi:10.1080/15401383.2016.1245642.

Moulton, M. A., & Moulton, P. (2013). How are we doing? Making service-learning assessment simple. *Journal of Service-Learning in Higher Education*, 2, 37-46.

Nguyen-Feng, V.N. Greer, C. S. & Frazier, P. (2017). Using online interventions to deliver college student mental health resources; Evidence from randomized clinical trials. *Psychological Services, American Psychological Association*, 14(4), 481–489. doi.org/10.1037/ser0000154.

Novotney, A. (2014). Cover Story: Students under pressure. College and university counseling centers are examining how best to serve the growing number of students seeking their services. *American Psychological Association*, 45 (8), 36. Retrieved from <http://www.apa.org/monitor/2014/09/cover-pressure.aspx>

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic Psychiatry*, 39(5), 503-511.

Rosenthal, B., & Wilson, W. C. (2008). Mental health services: Use and disparity among diverse college students. *Journal of American College Health, 57*:61-7.

Simon, C. (2017). More and more students need mental health services. But colleges struggle to keep up. *USA Today College*. Retrieved from <http://college.usatoday.com/2017/05/04/more-and-more-students-need-mental-health-services-but-colleges-struggle-to-keep-up/>

Snow, S. & D'Amico (2010). The drum circle project: A qualitative study with at-risk youth in a school setting. *Canadian Journal of Music Therapy, 16*(1), 12-24.

Stevens, C. (2003). *The art and heart of drum circles*. Milwaukee, WI: Hal Leonard.

Trost, W., Frühholz, S., Schön, D., Labbé, C., Pichon, S., Grandjean, D., & Vuilleumier, P. (2014). Getting the beat: Entrainment of brain activity by musical rhythm and pleasantness. *NeuroImage, 103*, 55–64.

Winkelman, M. (2003). Complementary therapy for addiction: Drumming out drugs. *American Journal of Public Health, 93*(4), 647-651.

Yorgason, J. B., Linville, D, & Zitzman, B. (2008). Mental health among college students: Do those who need services know about and use them?" *Journal of American College Health, 57*:173-81.

About the Authors

Lyn Gorbett Litchke
Associate Professor
Department of Health and Human Performance
Texas State University

Ricardo Dorman
Texas State University

Correspondence regarding this article should be addressed to:

Trason Aaron Willemin
Texas State University
twillemin@hotmail.com

Ting Liu
Associate Professor
Texas State University