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Exploring Exercise as Part of the Treatment Plan in Eating Disorder Rehabilitation Programs

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EXPLORING EXERCISE AS PART OF THE TREATMENT PLAN IN
EATING DISORDER REHABILITATION PROGRAMS

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HONORS PROJECT

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I. Introduction

When considering eating disorder rehabilitation, the use of exercise as a resource for rehabilitation is limited. Currently, the use of exercise in eating disorder rehabilitation programs is not well known as there is no gold standard for incorporating exercise in eating disorder rehabilitation programs. In order to better understand the current state of implementing exercise in eating disorder rehabilitation programs, an analysis of various eating disorder rehabilitation programs is required.

II. Summary of Current Literature

In order to better understand the current state of eating disorder rehabilitation in the United States, an analysis of literature regarding eating disorder programs ensued. A 2020 randomized control trial conducted by Zeeck et al. analyzed the incorporation of the Freilburg sport therapy program as an accessory outpatient program for participants. The researchers recruited a total of 26 participants which were randomized into two groups, an intervention and a control group. Inclusion criteria included a diagnosis of anorexia nervosa (AN) or bulimia nervosa (BN), an age of 18 years and older, and a score greater than 100 on the Commitment to Exercise Scale (CES) (Zeeck et al., 2020). The Freilburg sport therapy program design incorporates 12 weekly group meetings over three months, with the focus of the program on promoting physical activity safety, self-monitoring exercise behaviors, emphasizing behavior change, focusing on new experiences, and reflecting on changes made during the program (Zeeck et al., 2020). Considering the challenge of recruiting enough participants for the study, participants in the intervention group were able to complete 6.8 sessions and participants in the control group were able to complete 16.5 sessions. The results of the study concluded no significant difference for the primary outcome of reducing unhealthy exercise using the Compulsive Exercise Scale (Zeeck et al., 2020). Considering the small sample size, Zeeck and colleagues suggested continued research is needed to learn more about the effect of the Freilburg sport therapy program as an accessory outpatient program for participants.

In addition to the Zeeck et al. (2020) randomized control trial, a 2004 study conducted by Calogero and Pedrotty analyzed the treatment of obligatory attitudes and beliefs about exercise in women with eating disorders. In this study, 254 women with anorexia nervosa, restricting subtype (ANR), anorexia nervosa, binge-purge subtype (ANBP), bulimia nervosa (BN), or eating disorder not otherwise specified (EDNOS) were divided into an exercise or control group (Calogero & Pedrotty, 2004). Participants were placed into the exercise group as long as they were medically cleared and attended at least two, Level A exercise groups, while patients who were medically cleared but did not attend exercise groups were placed in the control group (Calogero & Pedrotty, 2004). Exercise group sessions were held four days per week for 60 minutes per session. Each session featured a warm-up and cool-down as well as combinations of exercises such as stretching, yoga, partner exercises, strength training, balance, aerobic activity, or recreational games depending on exercise level (Calogero & Pedrotty, 2004). The three levels of exercise were first sensing the self, then supporting the self, and lastly strengthening the self. The measures for this study included exercise history, eating disorder severity, weekly and total weight gain, Obligatory Exercise Questionnaire (OEQ), Objectified Body-Conscious Scale – Appearance Control subscale (OBC-AC), and the Eating Disorder Patient’s Expectations and Experiences of Treatment Questionnaire (EDPEX) (Calogero & Pedrotty, 2004). Results of this study demonstrated an increase in weight gain for participants with ANR and ANBP when

compared to the control group, and little changes in weight for participants with BN or EDNOS when compared to the control group. Calogero and Pedrotty's study also demonstrated a decreased emotional commitment, involvement, and rigidity with exercise in accordance with OEQ results for exercise group participants when compared with the control group. No significant differences were found in disordered attitudes and ideals about exercise for either group of participants. Calogero and Pedrotty's study analyzes the concept of treating eating disorder patients with therapy for exercise abuse as a way to establish a healthier relationship with exercise and eating.

Although a gold standard for incorporating exercise into eating disorder rehabilitation does not currently exist, Cook et al. (2016) conducted a systematic review of eating disorder treatments to explore the use of exercise for therapeutic purposes in eating disorder populations. This systematic review incorporated the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) method of analyzing the review articles. The PRISMA method incorporates a checklist of twenty-seven items under seven topics: title, abstract, introduction, methods, results, discussion, and funding (Cook et al., 2016). To be included in the systematic review conducted by Cook et al., the articles had to be English-written research articles, systematic reviews, or meta-analyses that described recommendations or protocols for the use of exercise in eating disorder rehabilitation. A total of eighteen articles were reviewed after exclusion criteria were applied (Cook et al., 2016).

The systematic review conducted by Cook et al. (2016) unveiled eleven guidelines that are typically applied when incorporating exercise into eating disorder rehabilitation. The first underlying theme of the incorporation of exercise in eating disorder rehabilitation is having a team approach which includes experts in exercise science, nutrition, mental health, pharmaceuticals, and physical therapy. Other common themes included medical concerns and contraindications, written contracts, a focus on positive reinforcement, graded programs, and low-intensity building to moderate-intensity exercise. In addition, Cook et al. note the various modes of exercise that can be incorporated, including aerobic and resistance training, with resistance training demonstrating benefits such as weight restoration and reductions in desire for thinness. Cook et al. (2016) discuss the importance of reeducating eating disorder patients on the safety of exercise to establish a healthy relationship with exercise throughout life. This may be the first systematic review focusing on incorporating exercise in eating disorder rehabilitation and therefore additional randomized control trials should be completed to fully understand the use of exercise in eating disorder rehabilitation (Cook et al., 2016). With these guidelines in mind, the concept of using exercise in eating disorder rehabilitation is beginning to be investigated as a therapeutic tool.

Hausenblas et al. (2008) also discussed the lack of research in the use of exercise in eating disorder rehabilitation. The authors of this article undermine the thought of exercise as solely causing an eating disorder and instead view exercise as a tool in eating disorder rehabilitation. Hausenblas et al. (2008) analyzed six articles regarding the effects of exercise in eating disorder rehabilitation. The purpose of these studies was to analyze the effects of an exercise intervention for patients with anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified participating in eating disorder rehabilitation. Specifically, the researchers of these studies reviewed the relationship between exercise and obligatory exercise, depression, medical

outcomes, quality of life, and body dissatisfaction (Hausenblas et al., 2008). Hausenblas et al. found positive effects of the use of exercise in eating disorder rehabilitation including an improvement in body composition, improved body satisfaction, and enhanced quality of life. Additionally, Hausenblas et al. (2008) constructed a conceptual framework including the interconnected factors of an eating disorder. At the center of this conceptual framework the authors emphasized the impact of psychological well-being on exercise, quality of life, social well-being, and physiological factors such as improved body mass, decreased risk for cardiovascular disease, and decreased risk for sleep disturbances. Conclusively, Hausenblas et al. (2008) reiterate the need for additional research regarding the use of exercise in eating disorder rehabilitation due to the potential positive effects of exercise as part of the treatment plan in eating disorder rehabilitation.

A randomized control trial conducted by Mathisen et al. (2018) compared a new form of eating disorder therapy which combined physical exercise and dietary therapy (PED-t) to cognitive behavioral therapy (CBT) in patients with BN or binge eating disorder (BED). In this study, female patients diagnosed with BN or BED were recruited through general practitioners, websites of eating disorder patient organizations, articles in newspapers, and more. Inclusion criteria included a DSM-5 diagnosis of BN or BED, with the diagnoses made using the questionnaire version of the Eating Disorder Examination (EDE-q) (Mathisen et al., 2018). This study incorporated three groups, first a wait-list control group (n=23), then a PED-t allocation group (n=78), as well as a CBT allocation group (n=78). Both treatment groups participated in four levels of treatment, including baseline measurements, post-test after 16 weeks of treatment, and two post-tests both six and 12 months after treatment (Mathisen et al., 2018). Outcomes included the EDE-q, the Compulsive Exercise Test (CET), and physical activity levels measured using an accelerometer. The EDE-q incorporates 18 questions with a ranking system of 0-6 in order to determine the presence of eating disorder characteristics. The CET assesses the presence of compulsive exercise in eating disorders using 24 items graded on a five-point scale, therefore these tools combined assist in determining overall presence of eating disorder characteristics as well as compulsive exercise behaviors (Mathisen et al., 2018).

As utilized by Mathisen et al. (2018), the PED-t program included sessions which incorporated exercise physiology principles, recommended maintenance of 150 minutes of moderate intensity exercise per week, and the adherence of protocols for proper use of physical activity in the treatment of exercise developed by systematic reviews. The program included one to two sessions per week of supervised resistance exercise in correspondence with dietary therapy as well as one to two sessions per week of unsupervised resistance and high intensity training exercise (Mathisen et al., 2018). In comparison, the CBT program consisted of one to two weekly group therapy sessions which incorporated behavioral change, evaluated progress, addressed the center of eating disorders, as well as relapse prevention. Mathisen et al. concluded the total CET scores were significantly reduced in both the PED-t and CBT group following treatment and during the follow up sessions. No significant differences were found for the CET scores in the control group, however both treatment groups were found to have lower CET scores for avoidance and rule driven behavior as well as exercise for weight control (Mathisen et al., 2018). Overall, the authors concluded a decrease in compulsive exercise for both PED-t and CBT treatment groups with no improvements in the level of physical activity compliance for any treatment groups.

Following the study conducted by Mathisen et al. (2018), Pettersen et al. (2017) coordinated interviews with the participants from the Mathisen study to gain perspective on the experiences in the PED-t program. The interviews included 10 of the participants who completed the randomized control trial, and all interviews were conducted at the Norwegian School of Sport Sciences. Interview questions included overall experiences of participating in the program and if the program met patients' expectations. Analysis of the participants' answers yielded results regarding new attitudes toward physical activity, new perceptions of food, feelings of being in a treatment group, as well as insight into their own recovery processes (Pettersen et al., 2017). Participants described boosted self-esteem, improved physical fitness, and an enhanced ability to listen to their body as benefits of the PED-t program. In addition, participants reconsidered the definition of a healthy diet, felt more reassured with a meal plan, and discovered a decrease in fear of foods, especially trigger foods (Pettersen et al., 2017). In regard to the mixture of BN and BED participants in one group, the participants commented that while the overall manner of the group was positive and supportive, some individuals struggled with comparison between progress of other group members. All participants noted that participating in the treatment program for a longer duration or offering additional sessions would have helped contribute to the feeling of being supported and committed to in the process of recovery (Pettersen et al., 2017). Overall, the interviews conducted by the authors revealed positive effects of the PED-t program with suggestions for future improvements to the program.

III. Review of Eating Disorder Programs

Many eating disorder rehabilitation programs do not have a systematic way of incorporating exercise into their eating disorder rehabilitation programs. According to the website for A Center for Eating Disorders (2018) in Birmingham, Alabama, the eating disorder rehabilitation program includes an "exercise as medicine" approach. This approach includes team members such as personal trainers, yoga instructors, and pilates instructors that assist in offering walking, yoga, personal training, and dancing services (A Center for Eating Disorders, 2018). On this website, the professional staff discuss offering a fitness integration coach and yoga instructor but do not discuss if these services are included as a part of therapy. Additionally, the website does not provide any information regarding if the exercise is individualized, or if exercise is solely included as a mode of therapy for individuals who choose to participate in these services (A Center for Eating Disorders, 2018).

Similar to the Birmingham, Alabama branch of A Center for Eating Disorders, 'Ai Pono Hawaii Eating Disorder Treatment Center does not mention exercise as a part of their eating disorder rehabilitation program in residential, partial hospitalization, or outpatient programs ('Ai Pono Hawaii Eating Disorder Treatment Center, 2020). 'Ai Pono indicates the importance for body awareness and mindfulness, which are executed through mindful walks as well as yoga, but does not provide any other use of exercise in their program ('Ai Pono Hawaii Eating Disorder Treatment Center, 2020). Comparatively, Alsana Eating Disorder Treatment (2020); with locations across the United States, incorporates an Adaptive Care Model with five main categories for treatment: medical, relational, nutritional, therapeutic and movement. Dr. Brian Cook, vice president of movement, research, and outcomes for Alsana, describes the movement portion of treatment as working on understanding body movement, working with the body for

patients, and helping patients to find enjoyment with movement (Alsana Eating Disorder Treatment, 2020). Alsana Eating Disorder Treatment; similar to the other eating disorder treatment programs discussed previously, does not mention if individualized exercise is prescribed as a part of treatment and if so, who prescribes this individualized exercise.

While current researchers suggest using exercise as a useful tool for eating disorder rehabilitation, further research needs to be conducted to confirm a gold standard. Currently, many eating disorder rehabilitation programs implement activities such as walking and yoga during rehabilitation but do not explicitly state if exercise is incorporated throughout the eating disorder rehabilitation programs.

IV. Methods

Participants

Participants included registered dietitians and program coordinators who work with outpatient eating disorder facilities in the United States.

Equipment, Materials, & Measures

A survey (Appendix D) focusing on questions regarding the use of exercise as part of the treatment plan in outpatient eating disorder rehabilitation programs was created and administered using Qualtrics through Bowling Green State University (Qualtrics, Provo, UT). Survey results were collected using Qualtrics.

Procedures

The Institutional Review Board (IRB) at BGSU approved this research study on February 22, 2021 IRB ##1702228-1. Information about participation in this study and a link to the survey were posted to the Sports, Cardiovascular and Wellness Nutrition (SCAN) Dietetic Practice Group of the Academy of Nutrition and Dietetics' community discussion page. Information and the survey link were also shared via Twitter and Facebook by Carrie Hamady, Associate Clinical Professor and Director of Undergraduate Didactic Program in Nutrition and Dietetics, as well as Jessica Kiss, Assistant Teaching Professor and Laboratory Coordinator in the School of Human Movement, Sport, and Leisure Studies. Individuals who reviewed the information about the study but were not a part of an outpatient eating disorder program staff were encouraged to share the survey link with a contact that is part of an outpatient eating disorder program staff.

Prior to completing the survey, participants read the informed consent waiver via Qualtrics. If the participant selected "No, I do not consent" to the informed consent waiver, the survey was ended. If the participant selected "Yes, I do consent" to the informed consent waiver, the survey proceeded. At the end of the informed consent, a statement read, "If you have any questions, please contact the Principal Investigator, Kassidy Fark, at 419-305-6370 or kfark@bgsu.edu. You may also contact the Key Personnel, Jessica Kiss, at 419-372-0227 or jekiss@bgsu.edu. You may also contact the Chair of the Bowling Green State University Institutional Review Board at 419-372-7716 or orc@bgsu.edu, if you have questions about your rights as a participant in this research."

To complete the survey, participants answered a series of eleven questions regarding the use of exercise as part of the treatment plan in the outpatient eating disorder rehabilitation program (Appendix D). At the end of the survey, participants were asked, "Are you willing to be contacted at a later date for further participation in research studies regarding the use of exercise in outpatient eating disorder rehabilitation programs?" If the participants selected yes, they were prompted to enter an email or phone number for further contact. If the participants selected no, the survey was ended. The survey was available for two weeks via social media links.

Data Analysis

Three participants completed the survey, therefore statistical analysis using statistical analysis software was not utilized for this study. Instead, a review of the pilot data will be discussed in the following chapter.

V. Results

Three participants completed the survey. Results from the survey provided insight about: 1) Exercise as part of the eating disorder treatment program, 2) Criteria to meet before introducing exercise as treatment, 3) Prescribing treatment, 4) Individualized exercise as part of the eating disorder treatment program, and 5) Including exercise physiologists as part of the eating disorder treatment program.

Exercise as Part of the Eating Disorder Treatment Program

All three participants indicated the use of exercise as part of the treatment program in their outpatient eating disorder programs. Regarding the prescription of aerobic exercise, one participant indicated the use of walking, jogging, and swimming for clients. Similarly, another participant indicated the progression from yoga to walking for eating disorder clients. Regarding an exercise prescription for aerobic exercise, resistance training, and flexibility training, one participant indicated their program utilizes a physical therapist who previously worked with eating disorder clients. Participants noted that strength training recommendations included yoga and light weights as well as weight training and calisthenics. Additionally, recommendations for flexibility training included yoga and pilates.

Criteria to Meet Before Introducing Exercise as Treatment

Prior to introducing exercise as part of the eating disorder treatment plan, a caloric goal and a verification that movement will be more beneficial than risky was required at one participant's clinic. Similarly, another participant commented that clients must meet a weight goal and a calorie goal prior to introducing exercise as part of the treatment plan. Lastly, another participant indicated clients must meet a weight goal, their menstrual cycle must be regulated for three months, and clients maintain an absence of altered attitudes toward exercise such as compulsion and obsession.

Prescribing Treatment

Two participants indicated registered dietitians as the rehabilitation team member responsible for prescribing exercise for treatment in outpatient eating disorder facilities. The third participant commented that a physical therapist was the individual responsible for prescribing exercise for treatment.

Individualized Exercise as Part of the Eating Disorder Treatment Program

Two of the three participants indicated the use of individualized exercise as a part of the eating disorder treatment program. For these two responses, one participant explained the use of a physical therapist to prescribe individualized exercise to clients. The second participant selected "Not Applicable" regarding which individual prescribes the individualized exercise programs for clients. Another participant indicated their program lacks individualized exercise prescriptions for clients due to the following: 1) Does not have a professional available to design an

individualized program, 2) Clients are given a generic plan, and 3) Clients are given guidelines upon exiting the program.

Including Exercise Physiologists as Part of the Eating Disorder Treatment Program

One participant indicated the belief that including an exercise physiologist as part of the rehabilitation team could help with prescribing individualized exercise programs. Similarly, another participant agreed that including an exercise physiologist as part of the rehabilitation team could help with prescribing individualized exercise programs and noted that a registered dietitian specializing in working with athletes or individuals who engage in sports could also provide individualized exercise prescriptions to clients. The third participant stated that whoever is assisting with the individualized exercise program needs knowledge and experience with this population when considering exercise.

VI. Discussion

The current use of exercise in outpatient eating disorder rehabilitation programs is not well known in the United States. Recent studies have indicated the investigation of the use of exercise in eating disorder rehabilitation and the attitudes perceived from the implementation of exercise in eating disorder rehabilitation (Zeeck et al., 2020). Although there is not currently a gold standard for the implementation of exercise into outpatient eating disorder rehabilitation programs, studies have demonstrated positive effects including improvements in body composition and body satisfaction as a result of exercise for eating disorder clients (Hausenblas et al., 2008). Current studies suggest the use of a combined exercise and dietary treatment program; however, no conclusions have been made regarding the benefits of a combined therapy method (Mathisen et al., 2018).

When addressing the use of exercise in outpatient eating disorder rehabilitation programs, the researchers of the current study found a consensus in the results. Regarding the modes of exercise incorporated as treatment, the researchers found consistencies among aerobic activity consisting of yoga, walking, jogging, or swimming. The researchers also found common resistance exercise incorporated into the eating disorder treatment included weight training, calisthenics, and yoga. Cook et al. (2016) supports variety in modes of exercise training and emphasizes the benefits of resistance training include weight restoration and decreases in desire for thinness. Typical flexibility exercises for eating disorder clients, as determined by the current study, included yoga and pilates. Additionally, the researchers found an emphasis on the importance of incorporating a physical therapist as part of the rehabilitation team, which also supports Cook et al.'s (2016) theme of a holistic team approach when prescribing exercise for eating disorder clients. Conclusively, the current study demonstrates a similarity among the participants' responses regarding the use of exercise in eating disorder rehabilitation.

While the literature does not discuss the criteria eating disorder rehabilitation clients must meet before beginning exercise, participants in the current study mentioned using common criteria. The first criteria participants suggested included the use of a caloric goal for beginning exercise in eating disorder treatment. Considering the caloric intake and expenditure is typically measured for each eating disorder rehabilitation client, the use of a caloric goal may be a time- and cost-effective measure for determining the beginning of an exercise treatment program. Additionally, other criteria for beginning exercise as a part of the treatment program included menstrual cycle regulation, weight goal achievement, and regulated emotions toward exercise. Further criteria for determining a start time for an exercise regimen may be dependent on the availability of staff members and the frequency of rehabilitation appointments.

Despite the underlying theme of a team approach in eating disorder rehabilitation programs as determined by Cook et al. (2016), there is not currently a consensus regarding which team member should prescribe exercise for eating disorder rehabilitation clients. The participants in the current research study mentioned the use of either a registered dietitian (RD) or physical therapist (PT) for exercise prescriptions. Since RDs are often readily available as part of the eating disorder treatment team and have direct access to caloric results, an RD may be the logical option for prescribing exercise treatment in an eating disorder rehabilitation program. The

selection of which treatment team member to provide exercise recommendations may depend on factors such as convenience, finances, or available staff members.

Despite the consensus among participants in the current study regarding the use of exercise in eating disorder rehabilitation, the researchers found a discord when analyzing the prescription of individualized exercise. Two participants indicated the use of individualized exercise in their perspective outpatient eating disorder rehabilitation programs, which reveals the use of individualized exercise prescriptions for eating disorder clients is available.

Regarding the individuals responsible for creating individualized exercise programs for clients, one participant appointed a physical therapist who was responsible for this prescription. The second participant indicated “Not Applicable” regarding the professional providing an individualized exercise program. The ability of an eating disorder rehabilitation program to offer individualized exercise prescriptions to clients may be dependent on the available staff members, as a physical therapist could greatly assist the treatment team in providing exercise prescriptions.

Comparatively, the current study indicated reasons for a lack of individualized exercise prescriptions including lack of available professionals, generic exercise prescriptions are used, and exercise guidelines are provided upon exiting the eating disorder rehabilitation program. The researchers of the current study found a unanimous belief that the incorporation of an exercise physiologist as part of the treatment team could help with individualizing exercise prescriptions. Therefore, there may be a relationship between the staff members available to prescribe individualized exercise and the use of individualized exercise prescriptions in outpatient eating disorder rehabilitation programs.

Strengths

One strength of this study was the availability and convenience of the survey. Considering the survey was delivered electronically, participants could respond to the survey on any device remotely. This mode of survey distribution was essential to enabling individuals working with eating disorder rehabilitation programs across the country to participate. In addition, electronic distribution of the surveys allowed for safe Coronavirus 19 practices considering in-person contact was not made.

Another strength of this study was the flexibility with completion time. All study participants completed the survey in under five minutes and had the opportunity to exit and re-enter the survey at any time prior to completion. The short duration of the survey could attribute to an increased willingness for participants to respond.

Limitations

There were multiple limitations to the current study. First, one limitation was the small sample size (n=3). Considering the survey was shared openly via social media networks including Facebook and Twitter as well as the SCAN Dietetics Practice Group of the Academy of Nutrition and Dietetics, responses were limited to the sharing of the survey. In addition, all survey participants responded similarly regarding the use of exercise in their eating disorder

rehabilitation programs, which may not represent the use of exercise in eating disorder rehabilitation programs across the country. Another limitation of the current study included the two-week duration in which the survey was available for completion. This brief availability period, in coordination with a lack of reminders to participate, could have resulted in a decreased number of responses.

Future Implications

The results from this study will be further investigated by the researchers beginning Fall 2021. Future investigations should involve collecting more data by extending survey duration and incorporating survey completion reminders. In addition, the current survey should be analyzed to ensure survey questions assist in answering the overall research questions. Other modes of survey sharing should be considered in order to gain more participants qualified to take the survey. Future research is needed to understand the use of exercise and individualized exercise prescriptions in outpatient eating disorder rehabilitation.

Conclusion

In conclusion, the current study supports the idea that exercise is used as part of the treatment plan in outpatient eating disorder rehabilitation. However, the current study does not generalize these results to all outpatient eating disorder rehabilitation programs, as few participants completed the survey. In addition, there was not a consensus regarding the use of individualized exercise prescriptions in eating disorder treatment plans. The availability of additional eating disorder treatment team members may influence the opportunity for individualized exercise prescriptions for eating disorder clients. Future research should be conducted to further understand the use of exercise in eating disorder rehabilitation and to further analyze the role of individualized exercise in eating disorder treatment.

VII. Annotated Bibliography

A Center for Eating Disorders (2018). <https://www.acenterforeatingdisorders.com/>.

A Center for Eating Disorders' eating disorder rehabilitation clinics span the United States. One center in Birmingham, Alabama offers an exercise as medicine approach in which the physical activity is structured in accordance with personal trainers, yoga instructors, and pilates instructors. However, these facilities do not mention if physical activity is included in all therapy treatment levels, to which extent physical activity is included, or which individual in the treatment program prescribes physical activity.

Alsana's Eating Disorder Treatment and Eating Disorder Recovery Centers (2020). <https://www.alsana.com/>.

Similar to A Center for Eating Disorders, Alsana Eating Disorder Treatment facilities incorporate an Adaptive Care Model of treatment. The Adaptive Care Model includes five core parts of treatment: medical, relational, nutritional, therapeutic and movement. The movement portion of the Adaptive Care Model involves assisting patients with understanding body movement and finding physical activity that the patient enjoys. The Alsana Eating Disorder Treatment website does not clearly indicate how movement is incorporated into the eating disorder treatment or at which level of treatment movement begins.

'Ai Pono Hawaii Eating Disorder Treatment Program (2020). <https://www.aipono.com/>.

'Ai Pono Eating Disorder Treatment Center located in Maui, Hawaii incorporates mindfulness activities including yoga and walking into their eating disorder treatment programs. These physical activities are used to increase body mindfulness and awareness, which 'Ai Pono emphasizes in their eating disorder rehabilitation. 'Ai Pono's website

does not mention a structural integration of exercise into eating disorder treatment, therefore the only physical activity known as a part of this treatment is mindfulness walks and yoga.

Calogero, R.M., & Pedrotty, K.N. (2004). The practice and process of healthy exercise: An investigation of the treatment of exercise abuse in women with eating disorders. *Eating Disorders*, 12(4), 273-291. <https://doi.org/10.1080/10640260490521352>.

Perhaps the first study analyzing the treatment of exercise abuse in eating disorder rehabilitation, Calogero and Pedrotty (2004) conducted a study involving 254 participants with diagnosed eating disorders. The diagnosed eating disorder was either anorexia nervosa-restricting subtype (ANR), anorexia nervosa-binge-purge subtype (ANBP), bulimia nervosa (BN), or eating disorder not otherwise specified (EDNOS). These participants were medically cleared and divided into an exercise session group (n=127) as well as a control group (n=127). Outcome measures included weekly and total weight gain, a reduction in obligatory exercise feelings according to the Obligatory Exercise Questionnaire (OEQ), and disordered attitudes and beliefs toward exercise. Intervention group participants could complete four sessions per week of group exercise, with each session lasting 60 minutes. The results of this study concluded an increase in weight gain for ANR and ANBP patients when compared to the control group. BN and ENDOS participants did not have significant differences in weight gain when compared to the control group. In addition, all intervention group participants experienced a decrease in emotional commitment, consumption, and rigidity with exercise when compared to the control group. No significant differences were found between groups regarding disordered attitudes and beliefs toward exercise.

This study serves as one of the first analyzing the treatment of exercise abuse as a sub-treatment of eating disorders. Treating the psychology behind excessive exercise should be further studied to confirm a reduction in thoughts of compulsive and rigid exercise routines.

Cook, B.J., Wonderlich, S.A., Mitchell, J.E., Thompson, R., Sherman, R., & McCallum, K. (2016). Exercise in eating disorders treatment: Systematic review and proposal of guidelines. *Medicine & Science in Sports & Exercise*, 48(7), 1408-1414. <https://doi.org/10.1249/MSS.0000000000000912>.

In an attempt to understand the current practices of incorporating exercise into eating disorder rehabilitation, Cook and colleagues (2016) conducted a systematic review of eighteen studies focusing on exercise as a part of eating disorder rehabilitation treatment. With the intent to understand how exercise is currently used in eating disorder treatment, Cook and colleagues (2016) collected these eighteen articles from various fields of exercise science and therapy. From this collection, Cook and colleagues (2016) summarized eleven core themes: team approach, medical concerns/contraindications, screen for exercise-related psychopathology, create a written contract, include a psycho-educational component, focus on positive reinforcement, create a graded program, start with mild intensity and slowly build to moderate, mode of exercise, nutrition, and debriefing. Cook and colleagues (2016) used these eleven core themes as guidelines for the use of exercise in eating disorder rehabilitation with a focus on reeducating clients on proper exercise mechanics as well as attitudes toward exercise.

This systematic review and proposal of guidelines for exercise in eating disorder treatment may be one of the first explorations of the role of exercise in eating disorder

rehabilitation. The proposal of guidelines outlines eleven key guidelines to be used when incorporating exercise into eating disorder rehabilitation. In addition, Cook and colleagues (2016) describe a proposal of exercising at very low intensity and gradually incorporating greater intensity and amount of exercise for patients with further understanding of motivations and health outcomes. Cook and colleagues (2016) emphasize the multidimensionality of incorporating exercise into eating disorder treatment, as many considerations overlap between therapeutic programs. As one of the first of its kind, Cook and colleagues present a review of the characteristics of the current use of exercise in eating disorder rehabilitation.

Hausenblas, H.A., Cook, B.J., & Chittester, N.I. (2008). Can exercise treat eating disorders. *Exercise and Sport Sciences Reviews*, 36(1), 43-47. <https://doi.org/10.1097/jes.0b013e31815e4040>.

Hausenblas et al. (2008) summarized the findings of six articles that included exercise as an intervention for eating disorders. From this analysis of articles, Hausenblas et al. (2008) found positive effects of incorporating exercise in eating disorder rehabilitation as measured by outcomes including an improvement in body composition, improved body satisfaction, and enhanced quality of life. In addition, Hausenblas et al. (2008) conceptualized a model which demonstrates the interconnected factors of an eating disorder, including exercise, physiological well-being, social well-being, as well as psychological well-being. The authors deduced that psychological well-being is at the core of eating disorder factors, and therefore improvements in psychological well-being can lead to improvements in eating disorders.

Hausenblas et al. (2008) conclude that exercise may be beneficial and safe for eating disorder patients in therapy, as incorporating exercise can improve both psychological and physiological well-being. Additional studies need to be conducted to determine which treatment is most efficient as well as the long-term effects of incorporating exercise into eating disorder rehabilitation.

Mathisen, T.F., Bratland-Sanda, S., Rosenvinge, J.H, Friberg, O., Pettersen, G., Vrabel, K.A., & Sundgot-Borgen, J. (2018). Treatment effects on compulsive exercise and physical activity in eating disorders. *Journal of Eating Disorders*, 6(43). <https://doi.org/10.1186/s40337-018-0215-1>.

This 2018 study conducted by Mathisen et al. compared a new form of treatment, which incorporates physical activity and dietary therapy (PED-t), to cognitive behavioral therapy (CBT) for bulimia nervosa (BN) and binge eating disorder (BED). Two treatment groups were randomly assigned, one PED-t treatment group (n=78) and one CBT treatment group (n=78), and a wait-list control group was also present in the study. This study concluded that both the PED-t treatment as well as the CBT program helped to reduce compulsive exercise behaviors but did not help to increase physical activity levels in patients with BN or BED.

These results demonstrate the beginning of implementing physical activity with dietary therapy in eating disorder rehabilitation. While PED-t therapy was not found to have more significant improvements than CBT therapy, this study serves as a foundational step to discovering if the use of exercise in eating disorder rehabilitation is beneficial.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *J Clin Epidemiol*. 6(7). <https://doi.org/10.1371/journal.pmed.1000097>.

In this 2009 article, Moher and colleagues summarize the protocol PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) as used in the Cook and colleagues systematic review and proposal of guidelines. The PRISMA protocol involves twenty-seven items divided into seven categories: title, abstract, introduction, methods, results, discussion, and funding. These items aid in the assessment of the quality of the systematic reviews and meta-analyses and help to distinguish high quality articles from low quality articles. The PRISMA protocol also incorporates a four-phase flow diagram that analyzes the identification, screening, eligibility, and inclusion of articles for a systematic review or meta-analyses.

In order to understand the Cook and colleagues “Exercise in eating disorders treatment: Systematic review and proposal of guidelines,” the article by Moher and colleagues (2009) serves as a summary of the protocol used by Cook and colleagues. Understanding the PRISMA protocol allows for a greater comprehension of the method used to formulate the systematic review by Cook and colleagues.

Pettersen, G., Sordal, S., Rosenvinge, J.H., Skomakerstuen, T., Mathisen, T.F., & Sundgot-Borgen, J. (2017). How do women with eating disorders experience a new treatment combining guided physical exercise and dietary therapy? An interview study of women participating in a randomized controlled trial at the Norwegian School of Sport Sciences. *BMJ Open*, 7. <https://doi.org/10.1136/bmjopen-2017-018588>.

In this study, Pettersen et al. (2017) interviewed ten females who participated in the PED-t treatment group of the Mathisen et al. (2018) study. Results of these interviews displayed four main categories of experiences for the participants. First, the participants felt a more positive attitude toward physical activity, especially when discovering new aspects and forms of physical activity during the therapy. Additionally, the participants in

the PED-t program discovered a new perspective of food by reducing the fear of food and identifying trigger foods that cause fear. Another category from the interviews was mixed feelings about being in a treatment group with both BN and BED patients, as some individuals did not feel understood and accepted in the treatment groups. Lastly, Pettersen et al. (2017) discovered that individuals in the PED-t treatment group found insight into their own recovery processes and wished for the option for additional treatment sessions using the PED-t program method.

Zeeck, A., Schlegel, S., Jagau, F., Lahmann, C., & Harmann, A. (2020). The Frielburg sport therapy program for eating disordered outpatients: A randomized controlled trial. *Journal of Eating Disorders*, 8(31), <https://doi.org/10.1186/s40337-020-00309-0>.

In this study, Zeeck et al. (2020) incorporated the Freilburg Sport Therapy Program in an outpatient eating disorder rehabilitation program in an attempt to reduce unhealthy attitudes toward physical activity and sport. This study included 26 participants randomized into two groups; a sport therapy intervention group and a control group. The study included a preliminary analysis at the start of the intervention, three-months of data collection, as well as a six month follow up for participants. The primary outcome included a reduction in unhealthy exercise according to the Commitment to Exercise Scale (CES). Secondary outcomes included eating pathology factors from the Eating Disorder Examination (EDE) as well as the analysis of various dimensions of unhealthy exercise using the Compulsive Exercise Test (CET). No statistically significant differences were found for the primary outcome between the groups to reduce unhealthy attitudes toward physical activity and exercise.

The Freiburg Sport Therapy Study serves as a beginning step to the incorporation of physical activity interventions in eating disorder rehabilitation. With further studies, as well as the inclusion of more participants to facilitate greater strength of analysis, the role of physical activity in eating disorder rehabilitation can begin to be understood.

Appendix A

INFORMED CONSENT FOR EXPLORING EXERCISE AS PART OF THE TREATMENT PLAN IN EATING DISORDER REHABILITATION PROGRAMS

INTRODUCTION OF THE RESEARCHER

Hello, my name is Cassidy Fark and I am currently an undergraduate Exercise Science student in the School of Human Movement, Sport, and Leisure Studies at Bowling Green State University (BGSU). In addition to myself, Jessica Kiss, Assistant Teaching Professor and Laboratory Coordinator in the School of Human Movement, Sport, and Leisure Studies and Carrie Hamady, Associate Clinical Professor in the Food and Nutrition Program at BGSU assisted in the study as my advisors. This research study is associated with my Honors Project supervised by my advisors and the Honors College at BGSU and has been approved by the IRB ##1702228-1. In order to better understand the current use of exercise in eating disorder rehabilitation programs, I am contacting individuals who work in or with eating disorder programs.

PURPOSE

When considering eating disorder rehabilitation, the use of exercise is limited as a resource for rehabilitation. Currently, the use of exercise is not well known as there is no gold standard for incorporating exercise in eating disorder rehabilitation programs. In order to better understand the current state of implementing exercise in such programs, an analysis of various eating disorder rehabilitation programs is required. A benefit of this study is understanding the potential use for exercise in eating disorder rehabilitation programs. Better understanding the use of individualized exercise prescription may have the potential to reduce relapse rates among eating disorder patients. There are no direct benefits to the participant.

PROCEDURE

If you agree to participate in this study, you will be directed to a survey regarding the current use of exercise as part of the treatment plan in outpatient eating disorder rehabilitation programs in the United States. The survey will be administered remotely via a Qualtrics survey link. The research questions to be answered include “Are outpatient eating disorder rehabilitation programs currently incorporating exercise into their treatment programs?” and “Are outpatient eating disorder rehabilitation programs currently incorporating individualized exercise for clients in the treatment programs?” The survey should take less than 10 minutes to complete and the survey can be completed on any device.

VOLUNTARY NATURE

Your participation is completely voluntary. You are free to withdraw at any time. You may decide to skip questions (or not do a particular task) or discontinue participation at any time without explanation or penalty. Your decision whether to participate will not affect your relationship with Bowling Green State University or your corresponding eating disorder rehabilitation center.

CONFIDENTIALITY PROTECTION

The confidentiality of subjects will be protected through Qualtrics, as results will be collected via Qualtrics. Access will be limited to Carrie Hamady, Jessica Kiss, and the Principal Investigator

in order to analyze and collect survey results. The data will be secured via Qualtrics for five years before it is destroyed. Considering the survey is administered electronically, some employers may use tracking software therefore you may want to complete the survey on a personal computer. Participants should not leave the survey open if using a public computer or a computer that others may have access to. After completing the survey, you should clear your browser cache and page history.

RISKS

The risk of participation is no greater than that experienced in daily life. The primary risk to you is a breach of data. The steps outlined above should minimize this risk by keeping your survey responses confidential.

CONTACT INFORMATION

If you have any questions, please contact the Principal Investigator, Kassidy Fark, at 419-305-6370 or kfark@bgsu.edu. You may also contact the Key Personnel, Jessica Kiss, at 419-372-0227 or jekiss@bgsu.edu or Carrie Hamady, at 419-372-0290 or carrieh@bgsu.edu. You may also contact the Chair of the Bowling Green State University Institutional Review Board at 419-372-7716 or orc@bgsu.edu, if you have questions about your rights as a participant in this research.

INFORMED CONSENT

I have been informed of the purposes, procedures, risks, and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary. I agree to participate in this research.

By selecting “Yes, I do consent,” you consent to participating in this study, acknowledge that you at least 18 years of age or older, and will be directed to the survey.

Recruitment E-mail

Hello, my name is Kassidy Fark and I am currently an undergraduate student in the Exercise Science Program at Bowling Green State University. I am contacting you to determine if you would be interested in participating in my research study. This study is associated with my Honors Project supervised by my advisors and the Honors College at Bowling Green State University and has been approved by the IRB ##1702228-1.

I desire to learn about the current use of exercise in eating disorder rehabilitation. In order to determine the current use of exercise as part of the treatment plan in eating disorder rehabilitation, I am contacting eating disorder programs. If you are interested in providing information about exercise as part of the treatment plan in your eating disorder rehabilitation program (regardless if your program offers this type of treatment), please click on the survey link below. The survey should take less than 10 minutes to complete and will greatly assist in the understanding of the use of exercise as part of the treatment plan in eating disorder rehabilitation. At the end of the survey, you will have the opportunity to provide your contact information for participation in additional research studies regarding the use of exercise in your outpatient eating disorder rehabilitation program.

Please feel free to share this link with other clinicians or program directors you know at other institutions or within your facility if you are not able to answer the questions yourself.

Please follow the link below to complete this survey.

LINK

Thank you for your time,

Kassidy Fark

Kassidy Fark

Bowling Green State University

Exercise Science Major 2021

Specialization in Exercise Programming

Phone: 419-305-6370

Social Media Recruitment

Researchers in BGSU's undergraduate Exercise Science and Food and Nutrition programs are looking for individuals who work in or with an eating disorder rehabilitation program knowledgeable of the current use of exercise in outpatient eating disorder rehabilitation. If interested, please click the link below.

LINK

Honors Project Survey

Start of Block: Informed Consent

Q1

INFORMED CONSENT FOR EXPLORING EXERCISE AS PART OF THE TREATMENT PLAN IN EATING DISORDER REHABILITATION PROGRAMS

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INFORMED CONSENT

I have been informed of the purposes, procedures, risks, and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary. I agree to participate in this research.

By selecting “Yes, I do consent,” you consent to participating in this study, acknowledge that you at least 18 years of age or older, and will be directed to the survey.

Yes, I do consent (1)

No I do not consent (2)

End of Block: Informed Consent

Start of Block: Survey Questions

Q1 Does your outpatient eating disorder rehabilitation program currently include exercise as part of the treatment program?

Yes (1)

No (2)

I do not know (3)

Skip To: Q2 If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = Yes

Skip To: Q3 If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = No

Display This Question:

If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = Yes

Q2 If you answered yes to question one, what type of

Aerobic exercise do practitioners recommend? (1)

Strength training do practitioners recommend? (2)

Flexibility exercise do practitioners recommend? (3)

Page Break

Display This Question:

If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = No

Q3 Why is your outpatient eating disorder rehabilitation program not incorporating exercise into the current treatment program? Please select all that apply.

- No exercise professional available on staff (1)
- Treatment program not long enough to include this (2)
- No reimbursement for these services (3)
- Not Applicable (4)
- Other: (5) _____

Page Break

Display This Question:

If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = Yes

Q4 Do you have certain criteria your clients have to meet before introducing exercise into their regimen? Please select all that apply.

- Client met weight goal (1)
- Client met Body Mass Index (BMI) goal (2)
- Client met calorie goal (3)
- Menstrual cycle regulated for six months (4)
- Not Applicable (5)
- Other: (6) _____

Page Break

Display This Question:

If Does your outpatient eating disorder rehabilitation program currently include exercise as part of... = Yes

Q5 In your outpatient eating disorder rehabilitation program, what rehabilitation team member currently prescribes exercise for treatment?

- Physician (1)
- Physical Therapist (2)
- Athletic Trainer (3)
- Exercise Physiologist (4)
- Kinesiologist (5)
- Not Applicable (6)
- Other: (7) _____

Page Break

Q6 Does your eating disorder rehabilitation program offer an individualized exercise program to clients?

Yes (1)

No (2)

Page Break

Display This Question:

If Does your eating disorder rehabilitation program offer an individualized exercise program to clie... = Yes

Q7 Which eating disorder rehabilitation team member designs the individualized exercise program to clients?

- Physician (1)
- Physical Therapist (2)
- Athletic Trainer (3)
- Exercise Physiologist (4)
- Kinesiologist (5)
- Not Applicable (6)
- Other: (7) _____

Page Break

Display This Question:

If Does your eating disorder rehabilitation program offer an individualized exercise program to clie... = No

Q8 Why does your eating disorder rehabilitation facility not currently offer individualized exercise programs for clients? Please select all that apply.

- No professional available to design an individualized program (1)
- No time to design an individualized program (2)
- Clients are given a generic plan (3)
- Clients are given guidelines upon exiting the program (4)
- Other: (5) _____

Page Break

Q9 Do you believe having an exercise physiologist as part of the rehabilitation team could help with individualizing client exercise prescriptions?

Yes (1)

No (2)

I do not know (3)

Other: (4) _____

Page Break

Q10 Would you be willing to be contacted at a later date for participation in additional research studies regarding the use of exercise in your outpatient eating disorder rehabilitation program? Your answer here will not affect your participation in this current study or with the investigators of this study.

Yes (1)

No (2)

Page Break

Display This Question:

If Would you be willing to be contacted at a later date for participation in additional research stu... = Yes

Q11 Please list your preferred email and phone number below.

Email: (1) _____

Phone Number: (2) _____

End of Block: Survey Questions
