

## ELASTIC OBSTACLE COURSE FOR PSYCHIATRIC SYMPTOMS OF MENTALLY HANDICAPPED

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### ABSTRACT

**Background:** Use of physical activity such as exercise with resistance, a nonpharmacological treatment (NPT) approach in support to the management of symptoms of psychiatric disorders, though scarce, has been widely published. Arts and crafts, the common therapeutic resource of occupational therapy (OT) in mental health setting since the profession's existence has been applied. Opportunities for recreational activities is in the heart of the OT profession.

**Aim:** To investigate the effect of the treatment as usual (TAU) only using arts and crafts versus the TAU plus elastic obstacle course (EO) in the difference in Comprehensive Occupational Therapy Evaluation (COTE) scores as an indicator of change and improvement in the general behavior, interpersonal behavior and task behavior of psychiatric patients.

**Method:** Study population (n=13), after screening, were randomized into the control (TAU only) and the experimental (TAU + EO) groups. Both cohorts received five (5) days of OT sessions utilizing the same individual and group TAU. Comprehensive Occupational Therapy Evaluation (COTE) scale was used to assess the behavior. Wilcoxon-Mann Whitney Test was used for profile comparison of patients' numerical variables across TAU only and TAU + EO groups. Level of significance was set at  $\alpha = 0.05$

**Results:** The initial data shows statistical significance in the improvement of behavior from baseline and after days 1-5 of OT sessions utilizing TAU + EO ( $p$  value = 0.028). TAU only group did not show significant difference ( $p$  value = 0.063) in behavior change. Statistical finding ( $p$  value = 0.199) showed no significant difference in comparison post treatment between the TAU only and TAU + EO groups regardless of exposure to EO.

**Conclusion:** Generally, the variables of interest such as the general, interpersonal and task behaviors improved as indicated in the change in COTE scores post treatment for both cohorts. This novel, creative, recreational yet therapeutic activity is another proof of OTs worth in the realm of evidence-based practice, reducing symptoms of psychiatric illness motivating to physically perform, to be productive and not be confined to idleness.

**Keywords:** Nonpharmacological treatment (NPT), Occupational Therapy (OT), Comprehensive Occupational Therapy Evaluation (COTE) scale, mental health, arts and crafts

### INTRODUCTION

There are many different mental disorders, with different presentations. These include depression, bipolar disorder, schizophrenia, and other psychoses, dementia, and developmental disorders including autism. According to the World Health Organization (WHO), these are generally characterized by a combination of abnormal thoughts, perceptions, emotions, behavior, and relationships with others. Mental and addictive disorders cause a considerable burden of disease that hinders functional performance and productivity in the execution of an individual's interests, hobbies, talents, and skills. All these

are deemed vital for planning family and community integration for which the mental health service's ultimate goal is anchored. Overall, about two-thirds of the Disability-adjusted life years (DALYs) from mental and addictive disorders are caused by depressive-anxiety-drug use and alcohol-use disorders (Rehm & Shield, 2019).

In the Philippines, the standard management of mental health care is a multi-disciplinary approach. A medical clearance and a referral to psychiatry require consultation with a psychiatrist from whom occupational therapy (OT) referral comes. The focus of OT is on the ability to engage in meaningful and purposeful tasks and to compensate in the presence of disorder and handicap. Included in the multidisciplinary team are nursing services, psychologists, social welfare services (social workers), and allied health professionals (Dieticians and Occupational Therapists (OTs)). Administrative service and most especially, the family of the service user are all part of the support team.

Various treatment strategies aside from pharmacotherapy have been developed to help decrease the symptoms of psychiatric illness. Arts and crafts, a non-pharmacological treatment (NPT) have been the staple therapeutic resource of OTs since the profession's existence. Clinical findings have proven its benefits, but in its utilization, the perception of the treatment had a "feminine" image. Kurthy (2020) added that scientifically, the evaluation of its use appeared complicated. As OT geared towards a medically based model, the use of arts and crafts took a downturn (Trinh, 2021). Adding to the need for a creative activity as an intervention is the evolution of the advancement in technology. As the Fourth Industrial Revolution took hold, the world of medicine and health sciences faced the era of digital revolution where advanced breakthroughs such as robotics, artificial intelligence (AI), the Internet of Things (IoT), 3-D printing, virtual reality and so much more have dominated the current practice/s (Liu, 2018). Following the fast-paced evolution and new discoveries, a "routine practice" was felt that led to a loss of creativity secondary to fatigue for various reasons (Delos Reyes, 2018). Hansen, Erlandsson and Leufstadius (2021) suggested that creative activities must be explored to acquire novel skills playfully and to provide opportunities for individuals to re-establish their habits, roles, and routines. Moreover, creative activities achieve a positive occupational identity and a healthy everyday life which will greatly release new creative energy similar to the use of arts and crafts. (Turcotte & Holmes, 2021). It is in this context that research on non-pharmacological treatment (NPT) which focuses on recreational occupation and promotes the "caring" nature of OT poses a challenge to the biomedical model, which focuses on the "therapeutic" or the "curing effect."

The psychiatric issues that affect the physical health compromise the functional performance of mental health service users. Treatment is considered satisfactory if aggressive and assaultive psychiatric symptoms have decreased as well as "appearance" looks "better" than during admission or initial consultation, or from a status of lost to follow-up. Albeit these improvements, it is unfathomable to see the patients idle and unproductive, with some, unfortunately experiencing relapse. The use of NPT such as physical activity was likened to antidepressants for patients with major depressive disorders according to Weir (2011) cited by American Psychological Association (APA) (2021) with a remark of its importance in treating depression and in relapse prevention. The common forms of exercise are walking/strolling, running, cycling, use of sports (e.g., soccer, football), etc. Gordon (2020) stated that the use of resistance exercise training (RET) significantly reduced anxiety symptoms among young adults. Most of the structured exercises without resistance are typical of physical movements while exercises with resistance generally focus on a particular muscle group as in the use of elastic band investigated by Hong (2018). Hence, there was a need to

conduct a treatment approach that will offer the service users an experience of autonomy over a fun-filled, novel, yet creative activity intervention that uses the whole body and is focused on the improvement of their general, interpersonal, and task behaviors.

## LITERATURE REVIEW

### Global Burden and Local Scenario of Mental Health Condition

Mental and addictive disorders cause a considerable burden of disease with depressive disorders causing most DALYs for both sexes. This is followed by anxiety disorders in women, while drug-use disorders and alcohol-use disorders are the second and third highest, respectively, in men (Rehm & Shield, 2019).

Epidemiological evidence on mental disorders in the Philippines might be little but the gravity it presents is so enormous that according to Lally (2019), fourteen percent of a population of 1,400,000 Filipinos with disabilities were identified to have mental disorders. The country has the third highest rate of mental disorders in the Western Pacific (Martinez et al., 2020), and an alarming  $\geq 3.6$  million Filipinos according to the Philippine World Health Organization (WHO) Special Initiative for Mental Health conducted in 2020 suffer from at least one kind of mental, neurological, or substance use disorder (DOH, 2020).

Mental health services are available in the archipelago but accessibility to healthcare and social services is limited especially in the realm of OT. The scarcity of practicing psychiatrists, more so in the allied health services, and the pooling of mental health professionals in larger urban cities such as the capital, Metro Manila, contribute to the unequal distribution of mental health services. Moreover, the migration of our esteemed Philippine graduates in the healthcare sector to foreign countries in the hope of better opportunities adds to the burden.

### Occupational Therapy in Mental Health

In determining the status of a service user's functional performance, clients are assessed according to various aspects of human functionality. For mental health conditions, the behavior aspect is the common symptomatologic presentation, for which the OT employs various therapeutic activities. The usual treatment approach since the birth of the profession is the utilization of creative activities such as arts and crafts to assist in recovery, reducing behavioral symptoms. Though in the 1920s and 1930s there was a dramatic decline in artistic occupational engagement (Trinh, 2021), its usage did not entirely vanish. Still, it remains a very common treatment modality, especially in a mental health setting (Zedel & Chen, 2021). The dearth of research on OT in mental health drives professionals to develop, improve and prove its value specifically in the utilization of therapeutic activities that provide leisure with a purpose.

### Benefit of Physical Activity on Sleep

As literature has presented, physical exercise, which is an NPT, is a form of activity that promotes the health and well-being of an individual whether he is sane or has mental health challenges. An increase in movement activity plays an essential role in the risk reduction of non-communicable diseases; engagement in physical activity leads to better mental health which helps in coping with the stresses and challenges in life (Pituk & Cagas, 2019). Sleep alone, taken for granted by most adolescents globally, gives the best benefits one can acquire

from movement activities. Yetlack of sleep is the most common complaint of patients and relatives during consultation. The study of Li et al (2021) on the effect of resistance training (RT) on sleep supports the use of NPT with RT in improving sleep efficiency and in decreasing sleep fragmentation in older adults in general and specifically, in older adults with MCI residing in an assisted living facility in China.

### **Non-Pharmacological treatment (NPT) on Dementia – Alzheimer’s Disease**

Interest in the concept of non-pharmacological treatment (NPT) is inevitable. Rodríguez-González et al. (2021) have discussed the fact that over time, prescription medications cannot control the progressive nature of debilitating conditions such as dementia-Alzheimer’s disease. For depression, researchers Watt et al. (2021), Haussleiter et al. (2020), Weir (2011) cited by APA (2021), Huang et al. (2021), and Xie et al. (2021), have established significant grounds on the benefit of NPT in various age groups though with heavier reports on the older population. The use of augmentative treatment in reducing symptoms of mental health conditions also has a great bearing in a population with Schizophrenia and various mental health disorders such as MCI, low-active without cognitive impairment (Non-CI), dementia, without cognitive impairment (Non-CI), PTSD, cognitive complaints, AD, amnesic mild cognitive impairment (MCI), late-life depression, anxiety, ADHD, and intellectual disability. Studies by Huang et al. (2021), Nygard et al. (2019), Lamb et al. (2018), and Yao et al (2021) that used different types of aerobic exercises have shown an improvement in global functioning and that no matter how old the cohorts are, their mental health could improve. An investigative finding by Woodward et al. (2018) of hippocampal volume increase was noted after a 12-week aerobic or weight-bearing exercise program.

### **Benefit of Physical Activity on Strength vs. Aerobic, with resistance vs. without resistance**

Researchers’ healthy argument on the use of strength versus aerobic, with the use of resistance or without it, brought a strong foothold that required further studies in this area. As Liu et al. (2020) stated, there is significant beneficial evidence in both strength and aerobic training. Exercise is generally comparable to antidepressants, the medications that are usually given to mental health patients. Weir (2011) cited by American Psychological Association (APA), (2021) expressed that exercise was not only important for treating depression, but also in preventing relapse. Gordon (2020) had a positive remark on the use of Resistance Exercise Training (RET) not only for patients with dementia but also among young adults where it significantly improved anxiety symptoms.

### **Effect of Living Habits on Mental Health Illness and Risk of Onset; Effect of Physical Activity on Children with Developmental Challenges**

Daily living habits including the right diet combined with regular physical activity enhance not only the physical health but also the mental health of persons with psychiatric illnesses (Bonfioli et al., 2018). Though somehow, an accidental event can be impactful from either sports-related or through exposure to environmental factors, it is important to be wary of the use of games, especially competitive sports. Environmental hazards, such as the risk of onset, in the long run, can contribute to mental health issues. Nevertheless, engaging in the practice of sports has a great link with a reduction in the susceptibility to EOD (Adani et al., 2020); the pattern of the resting state of EEG in children with developmental challenges also agrees with this. The down slope theta/ beta ratio post-exercise indicates a possibility that

acute exercise was functioning, regulating the hypo-arousal often seen in children with ADHD which also enhances postural control (Huang et al., 2018), which Borji et al. (2018) did not contest. Researchers further added that HJP should be a part of the physical education classes for children with special needs. Understandably, tots explore the environment through gross movements during unstructured play resulting in spontaneous learning. Phadsri et al. (2021) added that employment of sports and exercise programs greatly encourages participation and involvement with other people. These are some of the reasons why mental health professionals seize every opportunity to offer a solution to this neurological condition greatly affecting families and society as a whole. The psychiatric issues that affect physical health compromise the functional performance of this (service users) population.

Non-pharmacological treatment in mental health illness is paving the way and is gaining momentum slowly but steadily in support of medical management. It is important for service users to physically perform movements like an exercise. It is necessary to help them become conscious and aware of their existence and be productive again. Related literature cautioned that there is no standard form of physical activity, movement, or exercise due to the heterogeneity of the population, the interventions and outcome measures used as well as the limitations of the randomized controlled studies. Also, it is best to consider the age, fragility, and physical status of the mental health patients when using augmentative therapies.

## **METHODOLOGY**

### **Research Design**

An experimental design was used by the researcher to randomly assign homogenous study sample to intervention and control/ comparison groups in an attempt to isolate the effects of the intervention. Elements of this study design enabled the investigator to identify causal links between the intervention and the variables of interest (Munnangi & Boktor, 2021). From the use of this quantitative research design, change in the COTE scores, an indicator on the difference in general behavior, interpersonal behavior, and task behavior were determined by the effect of using the usual care plus the elastic obstacle course as intervention. Upon assessment of participant's eligibility, assignment to intervention or control group was performed using random number generator (<https://www.calculatorsoup.com>). Since blinding to the treatment was impossible, all personnel involved in patient randomization, outcome assessment measure and data analysis were independent from the investigator.

### **Sources of Data**

The primary source of data were the participants' baseline COTE scores from the TAU only and the TAU + EO groups, day one (1), day two (2), day three (3), day four (4) and day five (5) of OT sessions including the written remarks from the scorers of COTE in the comment section of the outcome measurement tool. Demographic data such as the participant's age, sex and diagnosis indicated in the information section of the COTE form were also included.

### **Population of the Study**

The population of the study was composed of service users of mental health services referred to OT that met the homogenous COTE score ranging from average of zero (0) to 25 and 26 to 75 (maintain and improved) that served as the baseline scores of the respondents to be analyzed. In a cross-sectional study in Taiwan, (Wang et al., 2020) COTE evaluation tool



was labelled such that 0-25 is severe, 25-50 is moderate, 50-75 is mild, 75-100 is normal. Locally, by convention, the COTE score is labelled the other way around, such that the lower the score the better.

The sample size as determined by computer generated computation based on ANOVA repeated measures (within-between) interaction design is a minimum of 7 per group meaning 14 selected by simple random sampling. With a level of significance of 0.05, 80% power, Partial Eta Squared of 0.1, hence, the calculation result of the minimum sample size required per each group. The sample size estimated using G\*Power 3.1. The resulting groups were divided into control and intervention group using simple random sampling. A priori was set since number of patients referred limited trial enrollment, total enumeration was conducted.

The service users of one (1) local mental health facility have not received OT service since around 2015 while the other local mental health facility with the same setting severity have not experienced OT service since 2005 though art therapy was introduced, it did not last long.

### **Instrumentation**

The research used the Comprehensive Occupational Therapy Evaluation (COTE) as an instrument tool to score the behavior of randomized participants for the purpose of collecting the primary data. The COTE is a standardized tool. It is a behavior rating scale that is used to distinguish occupational therapy's unique role in comprehensive adult mental health programs. It is used to identify three (3) behavior areas such as general behaviors, interpersonal behaviors, and task behaviors that impact occupational performance. This established rating instrument is designed to measure the strengths and conduct or actions of concern in different areas of behavior that greatly affect work performance (Chiu et al., 2020). The reliability and validity of this outcome measure tool have already been established.

### **Evaluation and Scoring**

For the procedure on scoring, the first part was to score each behavior based on the definitions given at the back of the scoring sheet. The second part was to add the scores in each behavior item to obtain the sub-totals and then get the sum of all obtained sub-totals to produce the total. Last but not the least was to write added comments in the space provided at the bottom of the scoring sheet. A scale of 0 to 4 is used to score each behavior item as defined in the instrument guidelines.

- 0 – NORMAL
- 1 – MINIMAL
- 2 – MILD
- 3 – MODERATE
- 4 – SEVERE

### **Data Gathering Procedure**

Permission to conduct the study and administer the innovative treatment procedure was secured from the Director of the Panganlungan Half way house Rehabilitation Center in Mabini and the chairman of the Department of Psychiatry, the Research Ethics Committee (REC) head, the Chief of Clinics, and the Medical Director of the Lipa Medix Medical Center in Lipa City. Consent was taken from the parents, relatives and/ or legal guardians of the

target respondents. Demographic profiles and baseline COTE score were collected prior to intervention proper while during days one to five (1-5) of the OT sessions, COTE scores were assessed daily. Both treatment groups received the same individual and group TAU.

Study population (N=16) were initially enrolled but due to uncontrollable situation three (3) were not included for the following reasons, not wanting to join the study, in an isolation room on restraint, and not meeting the selection criteria. Participants (n=13) of the study received individual and group OT sessions utilizing arts and crafts (TAU) as an activity. After baseline COTE score collection, randomization followed using random number generator (<https://www.calculatorsoup.com>) to create a list of random numbers from one to seven (1-7) in the TAU only and one to six (1-6) in the TAU + EO. All study respondent had complete attendance from day one to five (1 to 5) of OT sessions except three (3) participants from TAU only group for reasons of not wanting to join (1 absent on day 2; 1 absent from day 3 to 5), and early discharge from the facility (1 discharged on day 3).

There was no available OT in both areas at the time the study was conducted, hence the investigator utilized five (5) licensed nurses with work experience ranging from three (3) to 11 years and two (2) board eligible nursing graduate having work experience of five (5) and six (6) years. Training was provided on the use of the experimental tool. Some people scored the COTE evaluation of participants from Day one (1) through Day five (5). Because of the difficulty in getting a dedicated time for on-duty nurses in the tertiary hospital, different nurses scored patients on Day one (1) through Day five (5) of OT treatment sessions. Assessors of outcome measure were not blinded to the study participants.

Due to small sample size (n=13) secondary to uncontrollable reasons of unmet eligibility criteria, on restraint and no interest in joining the study as well as drops outs during the course of the study, intention to treat analysis was considered such that all primary data were analyzed.

Actual visit to the study sites was made possible for the facilitation and administration of this novel approach and ensured 100% retrieval of the accomplished COTE forms.

### **Statistical Treatment of Data**

The statistical tools used for the quantitative analysis in this study were the following:

1. Numbers and Percentages were used for reporting baseline and clinical characteristics of patients' categorical variables such as sex, diagnosis.
2. Mean standard deviation was used for reporting baseline and clinical characteristics of patients' continuous variables such as age and COTE scores.
3. Pearson's chi-squared test or Fisher's Exact Test was used for profile comparison of patients' categorical variables across TAU only and TAU + EO groups.
4. Wilcoxon-Mann Whitney Test was used for profile comparison of patients' numerical variables across TAU only and TAU + EO groups.
5. Wilcoxon signed-rank test was performed to assess if there was an improvement in the COTE scores from baseline and after the patients completed the 5-day intervention in both the TAU only and TAU + EO groups.
6. Mann-Whitney U test was utilized in order to assess and compare if there was a difference in the COTE scores across the interventions between the TAU only and TAU + EO groups.

Patient data were encoded and processed using Microsoft Excel and data analysis were performed using RStudio. The level of significance was set at  $\alpha = 0.05$ .

## RESULTS

The results are presented in figure and tabular form with corresponding inferences and interpretations.

### 1. Baseline COTE Scores of the Participants

**Table 1**  
**The Participants Baseline COTE Scores**

Participant	TAU only	Participant	TAU + EO
1	34	1	9
2	43	2	54
3	5	3	38
4	41	4	25
5	48	5	31
6	28	6	26
7	28		
Ave	32.43		30.50

Given in Table 1 are the average baseline COTE scores for both independent variables, specifically 32.43 for the TAU only group having seven ( $n=7$ ) respondents and 30.50 for the TAU + EO group with six ( $n=6$ ) respondents. A total of 13 participants were enrolled in this study. Number of participants in TAU only met the required sample size unlike in TAU + EO which was short of one (1) since having vulnerable and unpredictable population, a guaranteed attendance was very difficult and cannot be controlled for reasons such as on restraint, no interest to join the study, drop out due to poor attendance and early discharge, also, eligibility criteria was considered. The displayed results confer to the study of Mehta (2021) with a near average of pre-therapy COTE scores of 46.00-47.08 but with a much higher number of participants enrolled of 88 patients having mental health disorders admitted in a tertiary care hospital in India who also expressed of issues with participant enrolment while in Taiwan, the study of Wang et al. (2020), showed that the COTE scores before treatment averaged to 42.97 for an even higher number of respondents of 169 with schizophrenia and other psychotic disorders who were rescued from a temple asylum.

### 2. Difference in the COTE Scores from Baseline and After Days One to Five (1-5) of OT Sessions Utilizing the TAU only

**Table 2**  
**Difference in the COTE Scores from Baseline and After 5 Days of OT Sessions utilizing the TAU only**

Score	Mean	Wilcoxon Signed Rank Test	p-value	Interpretation
TAU Baseline	32.43	-1.859	0.063	Not Significant
After 5days	23.56			
Significance level @ 0.05				

As demonstrated in Table 2 with a level of significance set at 0.05, the difference in the COTE scores from baseline and after days one to five (1-5) of OT sessions utilizing the TAU



only reflected no significant finding with a  $p$ -value of 0.063. This entails that there maybe be a decrease in the COTE scores over the duration of treatment but not a considerable improvement as indicated in the mean of 32.43 at baseline and 23.56 after five (5) days using the TAU only. The values displayed no significant difference.

Such figures cannot be compared to other studies using the same outcome measurement tool, study design, and study population however from the pool of reviewed literature it was found out in Huang et al. (2021) meta-analysis having 79 participants with schizophrenia from Kaohsiung Chang Gung Memorial Hospital, China that physical exercise using TAU plus aerobic walking (TAW) had a positive change in the global function of those with schizophrenia spectrum disorder compared to the control who had no physical exercise. This finding accorded with Woodward et al. (2018) RCT from Canada with the same study population ( $n=17$ ) using 12-week aerobic or weight bearing exercise as intervention. These are reasons of possibilities for the result of statistical finding using Wilcoxon signed-rank test.

### 3. Difference in the COTE Scores from Baseline and After Days One to Five (1-5) of OT Sessions Utilizing the TAU +EO

**Table 3**

**Difference in the COTE Scores from Baseline and After 5 Days of OT Sessions utilizing the TAU + EO**

Score	Mean	Wilcoxon Signed Rank test	p-value	Interpretation
TAU + EO Baseline	30.50	-2.201	0.028*	Significant
After 5days	15.27			
*Significant @ 0.05				

As illustrated in Table 3, using the Wilcoxon Signed Rank test, result of remarkable finding with a  $p$ -value of 0.028 was observed as interpreted from the average baseline COTE scores and after days one to five (1-5) of OT sessions utilizing TAU + EO. The values conveyed a significant difference using an innovative device added to the usual care. A difference of 15.23 from baseline and after days one to five (1-5) of OT sessions in the experimental group was noted.

The statistical finding conformed with Mehta's and Wang's studies of change in COTE scores after exposure to OT intervention although both studies showed a reversed scoring of COTE scale such that 0-25 is severe, 25-50 is moderate, 50-75 is mild, 75-100 is normal. In contrast, the present study used the conventional COTE scoring such that the lower the score the better.

There are a couple of other researches that will support the study's finding of statistical significance such as in Gwacheon, South Korea, Hong et al. (2018) RCT applied resistive exercise using elastic band for resistance producing advantageous results reflective of delaying decline in cognitive function and improving physical well-being in contrast to the usual physical activity. Another is a two-stage study using an RCT by Huang et al. (2018) from Taipei, Taiwan, recruiting all boys as study participants ( $n=28$  for each group); experimental group (running on a treadmill) was with ADHD and those without were the control (video-watching). Results showed that acute exercise was responsible such that it regulates the hypo-arousal commonly observed in children with ADHD, it also indicated that

movement does not only regulate arousal but enhances postural control in children with developmental challenges. In addition, Borji et al. (2018) from Tunisia utilizing an open-label RCT using younger populations with intellectual disabilities as participants (n=33) found out that physical activities like hopping and jumping training program (HJP) played a big role in the improvement of postural performance in children with intellectual disabilities compared to the use of sensorimotor rehabilitation program (SRP). On a positive note, oftentimes when tots explore the environment through gross movements during unstructured play, spontaneous learning happens. A recent meta-analysis of 15 RCTs by Wang et al. (2022) involving 1331 patients showed that physical activity, particularly aerobic exercise plus resistance significantly reduces depression in all form of severity. In general, Coelho-Júnior and Uchida (2021) has proven that the use of resistance in exercise programs had significant value not only in the mental health conditions but also in the medical state of a person.

#### 4. Comparison Post-Treatment Between the COTE Scores of the TAU only and the TAU + EO

**Table 4**  
**Difference between the Post-treatment of COTE Scores of TAU only and TAU + EO**

Score after 5 days	Mean	Mann-Whitney test	p-value	Interpretation
TAU only	23.56	U =12.00 z = -1.286	0.199	Not Significant
TAU + EO	15.27			
Significance level @ 0.05				

As indicated in Table 4, employing Mann-Whitney U test, the COTE scores between the 2 independent variables (TAU only and TAU +EO) resulted to a *p*-value of 0.199 which showed no significant difference in comparison post-treatment. A difference of 8.29 from the mean of both groups was observed. Table 4 implied that there was a difference in the general, interpersonal and task behaviors as indicated in the change in COTE scores whether the respondents were exposed to a novel intervention or not.

No comparable studies from research volume were found as of this writing that utilized the same tool using RCT, nonetheless, the literature review of Kirsh et al. (2019) who elaborated on some of the OT interventions using creative occupations, the qualitative study done by Kaunnil et al. (2022) stressing therapeutic craft as a meaningful occupation, and the systematic review of Phadsri et al. (2021) praising the effectiveness of occupation-based intervention (OBI) and cognitive-behavioral therapy-based intervention (CBT-BI) showed evidence of behavioral change in social participation, reduction of depression or depressive symptoms, life satisfaction, and quality of life (QoL). Moreover, the employment of sports and exercise programs greatly encourages participation and involvement with other people. Rodríguez-González et al. (2021) have provided insights on the form of NPT comprised of physical, cognitive, and memory stimulation emanated a significant difference in the mental function and behavioral performance of AD patients pre- and post-therapy. These upholds that increase in movement activity leads to better mental health, helping people cope with the stresses and challenges in life (Pituk&Cagas, 2019).

## DISCUSSION

Initially, the study had 16 population (N=16) enrolled but due to uncontrollable situation three (3) were not included for the following reasons, not wanting to join the study, in an

isolation room on restraint, and not meeting the selection criteria. Participants (n=13) of the study received individual and group OT sessions utilizing arts and crafts (TAU) as an activity. After baseline COTE score collection, randomization followed using random number generator (<https://www.calculatorsoup.com>) to create a list of random numbers from one to seven (1-7) in the TAU only and one to six (1-6) in the TAU + EO. All study respondent had complete attendance from day one to five (1 to 5) of OT sessions except three (3) participants from TAU only group for reasons of not wanting to join (1 absent on day 2; 1 absent from day 3 to 5), and early discharge from the facility (1 discharged on day 3).

The physical set-up from the two (2) facilities was different in that one center is a half way house and the other one is a tertiary medical center. There was a limited space in the medical center but ample space in the half way house. This affected the length of the elastic obstacle course thus affected the movements of the participants. In addition, a more tedious work for the investigator to set-up and pack-away each treatment day in the hospital due to the limited space unlike the other site where a spacious hall or area was always available so that the innovative device was left standing secured until day five (5) of OT treatment session.

Common arts and crafts provided were puzzle activity, paper craft (3D butterfly, paper chain, tile trivet, papermache, origami), leaf tracing/ shading, towering fruit covering, drawing, coloring, simulated cooking. Arts and craft activity given to acquire the baseline COTE score was collage activity incorporated with activities of daily living (ADL). Both treatment groups received the same individual and group TAU. The service users of one (1) local mental health facility have not received OT service since around 2015 while the other local mental health facility with the same setting severity have not experienced OT service since 2005 though art therapy was introduced, it did not last long.

There was no available OT in both areas at the time the study was conducted, hence the investigator utilized five (5) licensed nurses with work experience ranging from three (3) to 11 years and two (2) board eligible nursing graduate having work experience of five (5) and six (6) years. Training was provided on the use of the experimental tool. Some people scored the COTE evaluation of participants from Day one (1) through Day five (5). Because of the difficulty in getting a dedicated time for on-duty nurses in the tertiary hospital, different nurses scored patients on Day one (1) through Day five (5) of OT treatment sessions. Assessors of outcome measure were not blinded to the study participants.

Due to small sample size (n=13) secondary to uncontrollable reasons of unmet eligibility criteria, on restraint and no interest in joining the study as well as drops outs during the course of the study, intention to treat analysis was considered such that all primary data were analyzed.

## CONCLUSIONS

Based on the salient findings of the study, the following conclusions were drawn:

1. Mean difference of baseline COTE scores (1.93) between the two groups suggests that proper randomization was performed.
2. TAU only group did not have a significant difference in behavior as observed in the values in COTE scores from baseline and after days one (1) to five (5) of OT sessions. The sedentary nature of TAU only, aside from absence of resistive therapeutic activity and drop outs since EO was not introduced are reasons of possibility. The service users of one (1) local mental

health facility have not received OT service since around 2015 while the other local mental health facility with the same setting severity have not experienced OT service since 2005 though art therapy was introduced but did not last long.

3. Use of TAU + EO shows significant difference in behavior as indicated in the change in COTE scores from baseline and after days one (1) to five (5) of OT sessions. Idleness and boredom were prevented in the utilization of this fun-filled creative and therapeutic activity in addition to arts and crafts. Almost every intervention day, study participants from both study sites made constructive and encouraging statements such as “nakakawala ng boredom,” “nakakaaliw,” “maibanaman,” “kakaiba,” “exercise,” “parang sapot” (spider web), “parang mahirappero kaya-kaya” after going through the innovative device. Most of the respondents in the intervention group who were skeptical at first and have tried the first time on Day one (1), went out in the other end with a confident look on their faces, smiling, carrying a more determined attitude with most of them on Day two (2) through Day five (5) going back and forth several times reaching about five (5) times for some who were able and having fun. There is no limit in the number of times a participant can go through the EO, as long as there is an observable enthusiasm and interest as well as physical capabilities in the manner their whole body adjust in getting through the garterized innovative device, it is permitted. On the last day of OT session referring to the given TAU, a service user coming from TAU + EO group commented, “thank you, you save the best for last.”
4. Study participants improved in the general, interpersonal and task behaviors as observed in the difference in their COTE scores post-treatment regardless of exposure to EO. Use of TAU along with its approach to treatment in OT history is still very much appreciative in the current mental health setting. From the results of this study, although both groups gained improvement in the three (3) areas of behavior as observed in the change in their COTE scores, their daily total scores during treatment days showed quite a difference with TAU only having scores ranging from five (5) to 59 while TAU + EO having scores ranging from 0 to 52 respectively. More drop in COTE scores was noticeable in TAU + EO group with marked improvement in non-productive behavior under general behavior; in cooperation, sociability and attention getting behavior under interpersonal behavior; and in engagement, activity neatness or attention to detail, problem solving, interest in activity, interest in accomplishment, and frustration tolerance under task behavior.

At any rate, utilization of this novel NPT has proven to benefit patients in the improvement of their behavior as inferred by change in their COTE scores despite the many years and decades of OT service absence.

Within the limitations of the study, the researcher therefore concluded that the use of an innovative device such as the EO is another achievement in responding to a call to search and research on available NPT that explored creative activities and recreational occupations and opportunities but is still therapeutic, a pursuit that is totally anchored to the OT profession. All risks were taken into consideration. Given the current local economic situation Filipinos are in and with the soaring cost of arts and craft materials, this novel activity will provide a useful OT treatment modality that can be used over and over earning a robust physical and mental health and a positive occupational identity. From the stimulation of the innovative device a constructive and optimistic exhibition of appropriate behavior through the release of a “feel good” hormone, dopamine (Legg & Raypole, 2019), a more vibrant and robust engagement in daily routine might take place.

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