

A Study of Functional Outcomes Generated in a Brief Animal-Assisted Therapy Among Chronic Patients of a Health Care Facility*

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ABSTRACT

Background: Schizophrenia, a common mental disorder, is associated with cognitive impairment in middle-aged and older adults. Research highlights challenges such as white matter loss, dementia risk, psychosocial issues, nursing home admissions, and limited cognitive benefits from antipsychotics. Animal-Assisted Therapy (AAT) is an emerging intervention for mental and physical illnesses, including schizophrenia.

Methods: This quasi-experiment included 20 patients from a health care facility, selected through purposive sampling based on inclusion/exclusion criteria.

Results: AAT significantly improved lower body strength (CST) and cognitive abilities (MOCA- P) but had no effect on agility (TUG). Male participants showed greater improvements than females in all domains: CST (+7.8), TUG (-2.365), and MOCA-P (+12). The dropout rate was 50% for females and 20% for males, primarily due to eligibility for discharge.

Conclusion: AAT significantly enhances lower body strength and cognitive function but does not improve agility. It is a safe, feasible adjunct therapy for chronic mental health conditions, though targeted interventions for mobility challenges are needed.

Keywords: Schizophrenia, functional outcomes, Animal-Assisted Therapy, AAT, Ghair Stand Test, Montreal Cognitive Assessment-Primary, Timed Up and Go, GST, MOGA

INTRODUCTION

In Kaplan & Sadock's Comprehensive Textbook of Psychiatry, schizophrenia was described as one of the most common serious mental disorders in the Synopsis of Psychiatry¹. Schizophrenia affects 1% of the population, with a quarter being middle- aged and older². It leads to increased oXidative stress, accelerated aging, and a shorter life eXpectancy compared to the general population. The study also stated that cognitive impairment is a core deficit in schizophrenia, impacting functional recovery. Middle-aged patients with schizophrenia eXperience accelerated white matter loss, increased dementia risk, physical and psychosocial challenges, and a higher risk of admission to nursing homes. Antipsychotic medication is generally less effective in improving cognition.

Research on human-animal interactions is still relatively new. Nonetheless, animal-assisted therapy (AAT) is increasingly being researched as a potential treatment for physical and mental illnesses, including schizophrenia³. Some studies have shown positive health effects, but the results have been miXed. Human-animal interactions (HAI) describe a wide spectrum of interactions and relationships between animals and humans and are of growing interest to researchers, the public, and the media⁴.

The purpose of this research was to study the Functional Outcomes Generated in Brief Animal-Assisted Therapy (AAT) Among Chronic Patients of a health care facility. It also aimed to eXplore the effect of AAT on cognitive, physical, and socialfunctions among adult patients with schizophrenia.

METHODOLOGY

Study Design

Quasi-eXperimental study design is often described as non-randomized pre-post intervention studies. This design is often used to evaluate the benefits of a specific intervention⁵.

Sampling Technique

Twenty participants were recruited for this study, and they were selected from the chronic male and female wards. Among the patients admitted in each ward, purposive sampling was selected according to the inclusion and eXclusion criteria.

In this quasi-experimental study on the functional outcomes of brief Animal-Assisted Therapy (AAT) among chronic patients of a health care facility, a sample size of 20 participants was strategically selected. This decision was

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influenced by the novelty of conducting such a study in a mental hospital setting in the Philippines, as well as by findings from systematic reviews, which show that previous AAT studies often utilized sample sizes ranging from 20 to 24 participants⁶. Here are the key points to explain this choice:

1. Establishing Guidelines: Since this is the first study of its kind in a mental hospital in the Philippines, it is crucial to establish and refine guidelines. A smaller sample size allows the researchers to develop and test these guidelines effectively without the complexity of managing a larger group.
2. Ensuring Safety: The safety of participants is a top priority, especially in a mental health setting. By starting with a smaller group, the researchers can closely monitor the participants, identify any potential risks, and ensure that appropriate safety measures are in place.
3. Managing Concerns: With 20 participants, the research team can better manage any concerns or issues that arise during the study. This manageable number allows for more individualized attention and a more thorough understanding of the challenges that may be encountered.
4. Preliminary Insights: This pilot study aims to generate preliminary data that can provide valuable insights into the effectiveness of animal-assisted therapy. The findings from this small sample can help identify trends, highlight potential challenges, and uncover variables that may impact the therapy's outcomes. These insights are crucial for refining the study design before proceeding with larger-scale research.
5. Feasibility and Manageability: Conducting a pilot study with a smaller number of participants helps the researchers assess the feasibility of the study design and the logistics involved. It allows them to fine-tune procedures and protocols before scaling up to a larger study. A sample size of 20 allows the research team to conduct the study within a controlled and safe environment. This limited number facilitates easier coordination and monitoring of participants, ensuring that the therapy sessions can be administered consistently and effectively.
6. Data Collection and Analysis: A smaller sample size enables the research team to collect and analyze data more efficiently. This preliminary data can provide valuable insights and help in making necessary adjustments to improve the study design. By starting with 20 participants, the study aims to ensure a controlled, safe, and manageable environment that will help establish a solid foundation for future

research. This approach helps to address any unforeseen issues, refine the study protocols, and ultimately contribute to the success and reliability of larger-scale studies in the future.

In summary, a sample size of 20 is justified as it facilitates manageable, efficient, and insightful research that lays the groundwork for future studies investigating the therapeutic benefits of animal-assisted therapy among patients with Schizophrenia.

1. Unit of Study

Patients admitted in the male and female chronic wards of a health care facility.

Materials and Procedures

Locale of Study

The research was conducted in wards of a health care facility.

Method of Study Selection

a. Inclusion Criteria:

- i. Diagnosis of schizophrenia according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders.
- ii. Ages nineteen to fifty-nine years old.
- iii. Those with stable physical health conditions are based on clinician evaluation.
- iv. Participants with no reportable incidents or accidents for at least a month.
- v. Provision of written informed consent.

b. Exclusion Criteria:

- i. Participants with severe cognitive impairment: aphasia or inability to follow three-step instructions.
- ii. Participants with an allergy to or fear of dogs
- iii. Participants with a history of aggression toward animals
- iv. Participants with a history of restraint
- v. Participants with a history of Bronchial Asthma, confirmed diagnosis of coagulation disorders, Seizure Disorder, Diabetes Mellitus, Hypertension, Intellectual Disability, Obsessive-Compulsive Disorders
- vi. Non-ambulatory participants
- vii. Re-admissions who had already participated in the study
- viii. No informed consent was given.

Research Instrument

i. Montreal Cognitive Assessment (MoCA)

The MoCA-P is a 30-point scale that evaluates visuospatial ability, executive functions, naming, attention, language repeat, language fluency, delayed recall memory, abstraction, calculation, and orientation. The total score indicates global cognitive function. Evidence has shown that the MoCA-P is sensitive to detect cognitive impairment in patients with schizophrenia.

ii. Chair Stand Test (CST)

The CST is a performance-based test, which requires participants to rise from a straight sitting position to a full standing position with their arms folded across their chest as many times as possible within 30 seconds. The test was completed on a seat placed near a wall. The number of repetitions was recorded. Higher scores represented better lower body strength

iii. Timed Up-and-Go (TUG)

The TUG is a widely used performance-based test that requires participants to stand up, walk, turn, and sit down. The time to perform the test is recorded in seconds. A lower score indicates better agility. The TUG has previously been used as an outcome measure to examine the effect of an exercise program in patients with schizophrenia and has good reliability.

Selection Process

Participation was offered to the selected patients admitted to the chronic wards who met all the inclusion criteria and none of the exclusion criteria. The list of admitted patients was acquired during the time of recruitment and the individuals were invited to participate. The research was explained to them and the first twenty (10 women and 10 men) who responded to the invitation and provided written consent were recruited. Participants who were successfully discharged and transferred to another ward were not replaced anymore. Since this is a pilot study and the first of its kind, there is no intention to ensure the representativeness of the population. Rather, the feasibility and appropriateness of conducting such an intervention is of priority and may also be reflected in the notes section of the Human-Animal Interaction-observer tool used in this study. Further studies may be recommended after the completion of this research.

Socio-Demographic Data

The socio-demographic data that will be collected are age, gender, civil status, medical ailments, presence of pets in the household, kinds of pets, duration

of living with the pets. The information was collected through a form and guided by nursing attendants and the principal investigator to ensure that the data are filled in with utmost accuracy and correctness. The form may be viewed in Appendix 2

Intervention

Requesting permission to conduct the study was performed first. Communitails, Inc. was coordinated and requested their participation in the study. Coordination with the proper authorities, specifically the chief of PETRO, Medical Training Office (MTO), and head of wards were also accomplished. The research proposal and other important documents were forwarded to these authorities for their review. All recommendations and comments were taken into consideration.

Early coordination was done with Communitails to explore partnership in providing HATs to participate in this study. Two weeks prior to the start of the group sessions, Human-Animal teams (HATs) were oriented regarding the study's objectives, protocols, and other ethical and safety considerations. Topics such as but not limited to confidentiality, patients' profiles, and their diagnoses, how to communicate with patients, proper interaction with patients and safety protocols shall be discussed. Informed consents were also collected from the handlers to affirm their participation in the research.

Participants received their usual treatment programs, consisting of nursing interventions, pharmacotherapy, occupational therapy, psychotherapy, and recreational activities. A total of eight group sessions were conducted for two different groups (one male and one female). Sessions were done at least once a week for each of the two groups in a wide and quiet room, appropriate for AAT. Sessions were planned, drafted, and agreed upon in advance by the Communitails professionals and the principal investigator. In each session, specific objectives were worked on utilizing different group dynamics.

Each session was facilitated by the principal investigator, who is a Resident in-training in partnership with a trained and certified Communitails Human-Animal Teams (HAT) and other staff as deemed relevant.

At the start of the first activity, the participants did pre-measures (MoCA-P, CST and TUG) tests guided by the principal investigator followed by the fifteen-minute warm-up session to build rapport and included participant greetings, introduction of the therapy dogs by their handlers, and the session orientation, the forty minutes main therapeutic activities. These therapeutic activities were categorized into the following four types:

physical activities, cognitive activities, social activities, and activities for positive emotion. Brief descriptions of the activities are listed in Appendix 1. Another set of tests mentioned above were done prior to the conclusion and feedback.

The succeeding sessions started with the fifteen-minute warm-up session, the forty minutes main therapeutic activities and the 5-minute feedback session were carried out each therapeutic activity and was facilitated by the researcher. Participants were encouraged to express their feelings and experiences during the animal-assisted therapy. Lastly, the activity ended with participants answering the Human-Animal Interaction Scale (HAIS) in Appendix 3. The activity concluded with the patients answering the post-measures (MoCA-P, CST, and TUG), still being guided by the principal investigator.

a. Animal Resources

For this study, only dogs were involved as therapy animals. The specific breeds were Corgi, Dachshund, French Bulldog, and Mini Schnauzer. The Communitails team was paid 10,000.00 per session to cover the time of the human-animal team, steward, and administrative costs, as agreed.

The intervention included Human-Animal teams (HATs), which were composed of the therapy dog and the handler. Before being HATs, they were selected for having a suitable character and appropriate aptitude, with a calm, docile, and obedient temperament, and training that enriched the sessions. The handlers and their partner animals must complete a specific training process with positive training techniques and habituation to the hospital environment to be able to easily adapt to different situations. They are trained in animal welfare, human-animal bonds, infection control, and risk management, standards of practice in health facilities, and canine body language. All the animals need to be cleared by their veterinarians to be in good health. Dogs need to comply with basic standards of vaccination, anti-parasitic treatment, and hygiene. These are all part of the certification process provided by Communitails. As a team, they have undergone screening, evaluation, and learning visits. Certifications are renewed after 2 years.

Communitails provided updated vaccination records and training the HATs attended. Example of criteria for screening HATs:

Environment:

- Observation of the dog with its handler in various situations based on the planned or spontaneous intervention, and natural environments.

- The dog must remain under control and easily redirect.
- The dog must not regularly vocalize inappropriately according to the context, population, or environment, and may be easily redirected, and presented safely.
- The dog must not overreact to distractions or unusual situations in the environment (e.g. sudden noises/movement, etcetera).

Social:

- The dog must present itself in a safe and approachable manner.
- The dog must display genuine interest in socializing with people and receiving attention from a variety of people, demonstrating appropriate responses.
- Observation of the dog with its handler with different groups/individuals, representative of the participant groups with which the dog will work.
- The dog must be assessed walking through a crowded area.
- The dog must not get over-excited or show continual signs of stress.
- The dog must demonstrate control around food, toys, and other resources and show no signs of resource guarding.
- If the dog is required to play as part of the AAI work, this must be assessed to ensure it will play appropriately.
- If the dog is required to work in the presence of other dogs, it must be well-mannered around other dogs with consideration given to normal canine communication and development.
- Dogs must show a good level of adaptability and enjoy interacting with the population with which it is expected to work.

Handling:

- The dog should remain relaxed with different people petting, checking over, and handling/grooming the dog if that is what is expected in the dog's normal line of work.

The dog's evaluation must include reaction to strangers, children, people on floor, level of obedience, grooming acceptance, walking on loose leash, ability to respond off-leash if appropriate, behavior in a crowd, responding to its name, ability to work with other animals in the environment and show resilience without any adverse reactions, appropriate reaction to distractions, ability to be redirected, acclimation to healthcare

equipment and environment, ability to be alone, and separation from the handler.

Dogs should demonstrate appropriate contextual responses in these situations. Where possible, the dog must be evaluated in the environment, under similar conditions, and with a similar population to which it will be working. The team will be evaluated before a session, and then during a mock or actual session. The dog must wear appropriate collars or harnesses, leashes, etc. that it would wear in a typical session. If a dog is expected to walk together with a participant and handler, or on a double leash, or off leash that must be evaluated as well.

b. Risk Assessment from the Animal Assisted Intervention International website as stated in the animal assisted intervention international website

The welfare of the dog during AAI:

- The dog must have access to an appropriate area and be given opportunities, as required, for rest, access to water, and access to toileting facilities before and after each session.
- Dogs must be given breaks based on activity level, development level, stress levels, weather, etc.
- Dogs need to have their own space and places to get away if desired
- Animals can choose to be with participants or move away and handlers can adjust intervention accordingly
- Sessions must be terminated immediately if the dog's welfare is in danger of being compromised.
- The dog must not mix with unfamiliar dogs on-site without careful consideration and supervision.
- If more than one dog is used in a working session, ideally, the dogs would have time to familiarize themselves with each other in advance.
- The hospital's access protocol and hygiene measures for hand washing, change of clothes, surface disinfection/cleaning, first aid, and acute crisis management protocols were followed.

The welfare of participants during AAI as mentioned in the Animal-Assisted Intervention International Standards of Practice:

- All AAI personnel (healthcare/human service providers, dog handlers, etc.) supporting the participant must demonstrate positive human interaction with the participant and have appropriate social skills, and verbal, and nonverbal communication.
- As mentioned in the Animal-Assisted Intervention International Standards of Practice (2013), providers respect the autonomy of participants and implement

an informed consent process before all interactions.

- AAI providers are expected to have specific training and supervision or mentoring in their area of AAI. Training includes clinical work, risk management, and informed consent:
 1. An Introduction to AAI (separate course focused on AAA/AAT/AAE) course or training (human-only)
 2. An AAI skills training for the human-animal team,
 3. An AAI human-animal team evaluation,
 4. An AAI practicum (either AAA/AAT/AAE) in which the human-animal team demonstrates AAI skills with volunteer (nonclinical) clients,
 5. Clinical supervision with an AAI-trained supervisor (this is more relevant for AAT/E)
- Participants are always supervised
- The AAI delivery team was trained in or had access to individuals trained in human first aid and animal first aid. Contact details of local veterinary and medical services and any other identified support were available in case of an emergency
- Orientation prior to the start of the intervention date was made for both the hospital staff and Communitails team
 - A brief discussion about Schizophrenia, confidentiality issues, expectations, and do's and don'ts for the Communitails team
 - A brief discussion about Communitails, animal welfare, expectations and do's and don'ts for the hospital staff

Termination of Services

- AAT services must be discontinued if the intervention is no longer supporting goals, if there are any health concerns of humans or dogs, or if there are any changes to the environment, dog handler, or population that are not conducive to the dog's skills or well-being.
- Participants who will be symptomatic will be removed from the activity and will be escorted back to the ward of origin. They shall be labeled as "dropouts."
- Dropout participants shall be immediately reassessed by the principal investigator and shall document it in their charts with corresponding recommendations.
- Participants who will have a bite accident shall be removed from the activity and will be assisted to the Emergency Room for appropriate treatment. They shall also be labeled as dropouts and shall be assessed by the principal investigator.

c. Principal Investigator's Training:

The following are the training programs completed by the Principal Investigator to ensure adequate skills and knowledge about the implementation of animal-assisted therapeutic activities.

- Animal-Assisted Interventions (AAI) in Counseling: An Introductory Course for Mental Health Professionals (August 19, 2021)
- Philippine Human-Animal Bond Conference (July 1-2, 2022)
- Communitail's Animal Assisted Intervention (AAI) Training Course
 - Module 1: Fundamentals of Animal-Assisted Interventions
 - Module 2: Animal-Assisted Interventions in Practice

Statistical Treatment of Data

To determine the difference between male and female performance in the tests used. Student t-test and Mann-Whitney test is employed depending on the normality of the distribution of the male and female scores. Shapiro-Wilk test is used for the identification of the normality of distribution. To determine the difference between pre-test and post-test scores on functional outcomes, the researcher employed a paired sample t-test and to see its effect size, the researcher used Cohen's d. On the missing values due to dropping out or choosing not to participate of the participant due to health issues and comfortability, the researcher has used an approach called Last observation carried forward (LOCF), this is the best approach of imputation since the nature of data gathering is that the participants are tested at each end of session. This is also helpful as the reason for dropping out is due to missing at random. Specifically, the participants were being transferred to another ward or were successfully assisted back home by the time of the study. As such, the research respects the circumstances of the client and was removed from the study which is at random. It is therefore assumed that their last score will remain stable across the next session.

RESULTS AND DISCUSSION

In this section, the results and discussion of the study were discussed, it will talk about the findings of the statistical analysis of the quasi-experimental. It used a paired sample t-test of the 1st point of measurement with the 8th (last) point of measurement. Then the comparison of gender used and the independent sample t-test.

Results

Out of 20 participants, 13 (65%) participants were retained at the end of the study. Out of the 7 (35%) participants who dropped out, 6 were returned to their families successfully after positive assessment and were deemed possible to be returned to the society and 1 was transferred to another ward. There had been one (1) event where the therapy dog had to be withdrawn earlier due to safety reasons. Because of the incident, one (1) of the ten (10) male participants declined to attend the next session. Debriefing was done to both participants and the Human-Animal team. The participant rejoined the next sessions and finished. Due to the drop out of almost half of the participants, the researcher decided to use an imputation known as the last observation carried forward (LOCF). This was done due to the availability of initial data which all of them have. Excluding the 9 participants from the analysis would make the analysis faulty. As such, the researcher decided to use LOCF instead of other imputation methods.

Among the twenty (20) participants, 8 (40%) were ages 5-9 years old. (85%) were single and none had a presence of medical illnesses. All (100%) of them have pets at home and 18 (90%) have dogs.

The hypothesis for the effect of brief animal-assisted therapy in functional outcomes among chronic patients of a health care facility is that Brief Animal-Assisted Therapy (AAT) cannot improve functional outcomes among the chronic patients of a health care facility. This is explored in this part of the chapter.

The principal investigator used mean and standard deviation for the measurement of central tendency and variation for the data used for the CST, TUG, and MOCA-P. The three data were all continuous variables. The data was analyzed first using the Shapiro-Wilk test to understand if the data are normally distributed, the result of the Shapiro-Wilk test found that the data are normally distributed. The result is in Table 4: Descriptives of the scores of functional outcomes. Due to that, the researcher decided to proceed with a normal t-test or student t-test for the comparison of the pre-test and post-test.

The mean for the CST, TUG, and MOCA-P for its pre-tests are 12.3s, [GR1] 8.5s, and 13.9s with standard deviations of 3.27, 2.63, and 7.5s, respectively. On the other hand, the mean for the CST, TUG, and MOCA-P for its post-test are 17.60, 9.44, and 18.20 with standard deviations of 5.9, 2.72, and 9.60, respectively. The descriptives are reported in Table 1. The values presented show that the data has a measure of dispersion that is good.

Table 1: Descriptive scores of functional outcomes

Functional Outcomes Scores	N	Mean	SD
8th CST	20	17.600	s.s86
1st CST	20	12.3s0	3.26s
8th TUG	20	9.441	2.719
1st TUG	20	8.s79	2.633
8th MOCA-P	20	18.200	9.600
1st MOCA-P	20	13.9s0	7.ss7

The researcher tested for the normality of distribution to determine if the data were normally distributed to determine the analysis to be done on the data. In the test of normality, the researcher found that for CST, TUG, and MOCA-P the W is 0.9s3, 0.936, and 0.9s4 with p-values of 0.410, 0.199, and 0.426, respectively. This W-value indicates that the data are normally distributed as it is close to one while the p-value indicates whether it is significant or not if it is less than 0.0s. All the value shows that the data are normally distributed and are significant. This information is all presented in Table 2: Test of normality.

Table 2: Test of Normality (Shapiro-Wilk)

Post-test	Pre-test	W	p
8th CST	1st CST	0.9s3	0.410
8th TUG	1st TUG	0.936	0.199
8th MOCA-P	1st MOCA-P	0.9s4	0.426

Note. Significant results suggest a deviation from normality.

*Significant

The data are normally distributed, normally dispersed, the researcher has proceeded to use paired sample t-tests to compare the post-test and pretest functional outcome scores and identify the difference in the scores after undergoing animal- assisted therapy. The result found that the t-statistics of CST and MOCA-P are 4.104 and 4.443, respectively. This t-statistic is found significant as its p-values are 0.0006037 and 0.0002793. On the other hand, the difference in all participants' TUG is found to be non-significant with a value of 1.673. The difference in the mean per functional outcomes is s.2s, 0.862, and 4.2s, respectively.

This leads us back to the hypothesis that Brief Animal-Assisted Therapy (AAT) cannot improve functional outcomes among the chronic patients of a health care facility. As presented, the functional outcomes of CST, and MOCA-P namely, lower body strength and cognitive ability are found to be improved as evidenced by the pre-

test and post-test difference scores. However, the agility functional outcomes that are represented by TUG are found to be not significant. There we can say that the functional outcomes (CST and MOCA-P) improved due to the presence of animal-assisted therapy. This means that we fail to accept the null hypothesis as evidenced by the significant difference between the two functional outcomes.

In addition to that, the researcher tried to find the effect size of the animal- assisted therapy through Cohen's d. Cohen's d that the researcher found out that the CST and MOCA-P have 0.918 and 0.993, respectively. While the TUG's Cohen's d is 0.374. This shows that the presence of animal-assisted therapy is effective in improving the client's functional outcome in terms of gross motor skills and cognitive ability. On the other hand, there is a small effect size of the animal-assisted therapy on the mobility of the client since the value of Cohen's d is only 0.374 making it only small in effect size.

Table 3: Paired Samples T-Test of pre-test and post-test

Post Test	Pretest	t	df	p	Cohen's d	SE Cohen's d
8th CST	1st CST	4.104	19	6.037e-4*	0.918	0.326
8th TUG	1st TUG	1.673	19	0.111	0.374	0.199
8th MOCA- P	1st MOCA- P	4.443	19	2.793e-4*	0.993	0.121

Note. Student's t-test.

*Significant

The hypothesis on the difference in functional outcomes generated in a brief animal-assisted therapy between male and female patients in the chronic wards is that there is no difference in the functional outcomes Generated in a Brief Animal-Assisted Therapy (AAT) between male and female patients of a health care facility. This hypothesis is explored in this section.

Only s (s0%) women and 8 (80%) men were retained by the end of the study. There was a 3s% dropout of participants due to them being discharged and returned to their homes, and one being transferred to another ward. They have been found eligible for return after careful assessment according to the center's standards.

In the analysis of the comparison of two gender groups, the researcher used the Student's t-test and Mann Whitney test on table 2. This is for the reason that after the Shapiro-Wilk test that was done, the researcher found out that the normality of distribution of the data in CST and TUG are normally distributed while for MOCA-P it was not normally distributed. This was after getting a

0.0006364 for the p-value of the W statistic that is 0.688, this indicates that the data are not normally distributed. This information is all presented in table 3: descriptive statistics.

In addition to this information, the researcher used both mean and median with standard deviation and interquartile range (IQR) as a measure for central tendencies and dispersion. This is the reason for previous finding of normality of distribution wherein the MOCA-P males are not normally distributed. As such, it is decided that both t-test and Mann Whitney U test will be used as a measure for difference which uses mean and median, respectively.

As presented in Table 3, the mean of males and females in CST is 21.400 and 13.800 with standard deviations of s.337 and 2.300, respectively. With TUG, the mean is 8.2s8 seconds and 10.623 seconds with standard deviations of 2.s48 and 2.4s1, respectively. On the other hand, the Median of MOCA-P of males and females is 24.s00 and 12.s00 with IQR of 4.s00 and 11.2s0, respectively.

Table 4: Descriptive Statistics of final measurement of functional outcomes grouped by sex

Statistical measurement	8th CST		8th TUG		8th MOCA-P	
	Male	Female	Male	Female	Male	Female
Median	21.s00	14.000	7.630	9.87s	24.s00	12.s00
Mean	21.400	13.800	8.2s8	10.623	24.000	12.400
Std. Deviation	s.337	2.300	2.s48	2.4s1	7.s13	7.961
IQR	8.s00	1.7s0	3.0s0	3.7ss	4.s00	11.2s0
Shapiro-Wilk	0.923	0.899	0.890	0.928	0.688	0.967
P-value of Shapiro-Wilk	0.381	0.213	0.168	0.431	6.3*e-4*	0.864

*Significant

The t-statistics in CST and TUG are 4.13s and -2.11s with p-values of 0.0006216 and 0.049 which are both statistically significant. On the other hand, the Mann Whitney u score of MOCA-P is 87.s00 with a p-value of 0.00s which is also statistically significant. These are all presented in Table 4: Independent Samples T- test. Which leads us back to the hypothesis, "There is no difference in the functional outcomes Generated in a Brief Animal-Assisted Therapy (AAT) between male and female patients in the chronic wards of a health care facility". With the findings all statistically significant, we can reject the null hypothesis and accept the alternative hypothesis that is, "There is a difference in the Functional Outcomes Generated in a Brief Animal-Assisted therapy between male and female patients in the chronic wards of a health care facility"

Table 5: T-Test of functional outcomes

Functional Outcome	Test	Statistic	df	p
8th CST	Student	4.13s	18	6.216e-4*
	Mann-Whitney	93.s00		0.001*
8th TUG	Student	-2.11s	18	0.049*
	Mann-Whitney	22.000		0.03s*
8th MOCA-P	Student	.3s1	18	0.004*
	Mann-Whitney	87.s00		0.00s*

*Significant

The difference in the male and female performance are as follows: for CST, 7.8, for TUG -2.36s, for MOCA-P 12. This means that the lower body strength, agility and cognitive ability for male patients with chronic schizophrenia are better after the animal-assisted therapy.

DISCUSSION

This study investigated the functional outcomes of a brief Animal-Assisted Therapy (AAT) intervention among chronic patients of a health care facility. The results indicated a significant improvement in lower body strength, as measured by the CST, and cognitive abilities, as assessed by the MOCA-P. However, no significant changes were observed in agility, measured by the Timed Up and Go (TUG) test. When compared to the study by Chen et al² the AAT group in their study showed a greater increase in lower extremity strength and, like our study, no improvement in agility. However, a key difference was that cognitive function improved in our study, whereas it did not show a significant change in their sample.

Furthermore, the study aimed to test the hypothesis that there would be no difference in the functional outcomes of brief Animal-Assisted Therapy (AAT) between Male and female patients in the chronic wards of a health care facility. However, the results led to the rejection of the null hypothesis and the acceptance of the alternative hypothesis, indicating that gender differences do exist in the outcomes of AAT. Of the 20 participants, there was a significant dropout rate, with s0% of women (s out of 10) and 80% of men (8 out of 10) completing the study. The dropout was mainly due to participants being deemed eligible to return home after assessments. Statistical analyses revealed that while the data for lower body strength (CST) and agility (TUG) were normally distributed, cognitive ability (MOCA-P) was not, leading to the use of both t-tests and the Mann-Whitney U test. The results showed significant differences between

males and females in CST, TUG, and MOCA-P. Specifically, male participants showed greater improvements in lower body strength (CST), agility (TUG), and cognitive ability (MOCA-P) compared to females, with differences in performance scores of 7.8 for CST, -2.36s for TUG, and 12 for MOCA-P. These findings suggest that male patients with chronic schizophrenia had better functional outcomes from AAT than female patients, highlighting the importance of considering gender differences when assessing the efficacy of such interventions.

CONCLUSION and RECOMMENDATION

Strengths and Limitations

In terms of strengths, the study employed robust analytical methods, such as paired t-tests and Cohen's d, to assess the intervention's impact across multiple functional domains, including motor skills, mobility, and cognition. The use of the Last Observation Carried Forward (LOCF) technique for imputing missing data helped to maintain the validity of the study despite participant dropouts.

However, the study had some limitations, including a small sample size, which restricts the generalizability of the findings, and the potential for dropout-related bias, which could have affected the statistical power. Additionally, as the study was conducted in a single setting, the results may not be applicable to other mental health facilities or populations.

RECOMMENDATION

Further research is needed to expand on these findings, with larger studies involving more diverse populations and longer follow-up periods to assess the sustained effects of Animal-Assisted Therapy (AAT) over time. Additionally, exploring complementary therapies that specifically target agility could help address the mobility challenges observed in this study, offering a more comprehensive approach to functional improvements. To maximize the potential benefits of AAT, it is also important to consider its integration into holistic care models within mental health facilities. By incorporating AAT alongside other therapeutic interventions, mental health programs can provide a more well-rounded approach to supporting patients' physical and cognitive health.

CONCLUSION

In conclusion, the study rejects the null hypothesis for both lower body strength (CST) and cognitive abilities (MOCA-P), confirming that Animal-Assisted Therapy (AAT) leads to significant improvements in these areas. However, the null hypothesis is not rejected for agility (TUG), indicating that AAT had no significant effect on this functional domain. The findings suggest that AAT may serve as a valuable adjunctive therapy for chronic mental health patients, particularly in enhancing lower body strength and cognitive function. The lack of improvement in agility underscores the need for more targeted interventions that address mobility and agility challenges. Furthermore, the study supports the feasibility and safety of AAT in clinical settings, as no adverse reactions were reported, highlighting its potential as a safe and beneficial intervention for individuals with chronic mental health conditions.

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