

# Effectiveness of animal-assisted interventions in preventing violence in acute psychiatric inpatients

Eficácia de intervenções assistidas por animais na prevenção da violência de doentes psiquiátricos agudos hospitalizados

Eficacia de las intervenciones asistidas con animales en la prevención de la violencia entre los pacientes psiquiátricos agudos hospitalizados

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## Abstract

**Theoretical framework:** Violence in acute psychiatric units is a major challenge for healthcare professionals due to its consequences.

**Objectives:** To assess the effectiveness of an Animal-Assisted Intervention (dog) programme in preventing violence in acute psychiatric units.

**Methodology:** Quasi-experimental study with an experimental group (26 patients) and an equivalent control group. The experimental group was subjected to a programme composed of 6 15-minute visits by a dog/handler team over the course of 3 weeks. Every session involved 2 patients. The psychiatric symptoms and the experience and expression of anger were assessed before and after the programme. The aggressive behaviours were assessed during the programme.

**Results:** The programme proved to be effective in reducing the frequency and severity of aggressive behaviours and the use of psychotropic drugs. No evidence was found on the impact of this programme on psychiatric symptoms and anger experience and expression.

**Conclusion:** These interventions may be a complementary strategy for preventing and controlling violence in acute psychiatric inpatients.

**Keywords:** violence; accident prevention; animal-assisted therapy; psychiatric hospitals; experimental epidemiology.

## Resumo

**Enquadramento:** A violência de doentes psiquiátricos agudos hospitalizados constitui um grande desafio para os profissionais dado as suas consequências.

**Objetivos:** Avaliar a eficácia de um programa de Intervenções Assistidas por Animais (cão) na prevenção de violência em unidades psiquiátricas de agudos.

**Metodologia:** Estudo quasi-experimental, com um grupo experimental (26 doentes) e um grupo de controlo equivalente. O grupo experimental foi sujeito a um programa que incluiu 6 visitas de uma dupla (cão e educador), 15 minutos cada, ao longo de 3 semanas; cada sessão envolveu 2 doentes. Antes e após o programa foram avaliadas a sintomatologia psiquiátrica e a experiência e expressão da ira; no período do programa foram avaliados os comportamentos agressivos.

**Resultados:** O programa demonstrou ser eficaz, diminuindo a frequência e gravidade dos comportamentos agressivos e o recurso a psicofármacos. Não se obteve evidência de que influencia a sintomatologia psiquiátrica e experiência e expressão da ira.

**Conclusão:** Este tipo de programa poderá constituir uma estratégia complementar na prevenção e controlo da violência de doentes psiquiátricos agudos hospitalizados.

**Palavras-chave:** violência; prevenção de acidentes; terapia assistida por animais; hospitais psiquiátricos; epidemiologia experimental.

## Resumen

**Marco contextual:** La violencia en los enfermos psiquiátricos agudos hospitalizados constituye un gran desafío para los profesionales debido a sus consecuencias.

**Objetivos:** Evaluar la eficacia de un programa de Intervenciones Asistidas por Animales (perro) en la prevención de la violencia en unidades psiquiátricas de agudos.

**Metodología:** Estudio cuasi-experimental con un grupo experimental (26 pacientes) y un grupo de control equivalente. El grupo experimental siguió un programa de 6 visitas de un par (perro y educador) de 15 minutos cada una durante 3 semanas; en cada sesión participaron 2 enfermos. Antes y después del programa se evaluó la sintomatología psiquiátrica y la experiencia y expresión de la ira. Durante el periodo del programa se evaluaron los comportamientos agresivos.

**Resultados:** El programa demostró ser eficaz, pues disminuye la frecuencia y la gravedad de los comportamientos agresivos y el recurso a psicofármacos. No se obtuvo ninguna prueba de que influya en la sintomatología psiquiátrica y en la experiencia y expresión de la ira.

**Conclusión:** Este tipo de programa puede ser una estrategia complementaria para la prevención y el control de la violencia de enfermos psiquiátricos agudos hospitalizados.

**Palabras clave:** prevención de accidentes; terapia asistida por animales; hospitales psiquiátricos; epidemiología experimental.

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## Introduction

The phenomenon of violence in acute psychiatric units is usually managed through psychopharmacological therapies. However, it can also be managed by interventions in the therapeutic environment which reduce environmental and communicational stress (Nijman, 1999), such as Animal-Assisted Interventions (AAI). Considering the possibility that a dog might facilitate the adaptation to reality and promote behavioural adjustment, a study was developed with the purpose of assessing the effectiveness of an AAI (dog) programme in preventing violence in short-term psychiatric units. This effectiveness should be translated into indicators of change in aggressive behaviours (frequency, nature and severity), psychiatric symptoms, and anger experience and expression.

## Background

Violence in acute psychiatric settings has been understood as an incident involving inpatients' aggressive behaviours. It has been regarded as a prevalent phenomenon, particularly in short-term psychiatric units (Nijman, Palmstierna, Almvik, & Stolker, 2005). Some studies indicate that about 10% of psychiatric inpatients on these units develop aggressive behaviours (Marques, Mendes, & Sousa, 2010). It has also been considered a worrying phenomenon associated with the difficulties experienced by healthcare professionals in controlling and preventing aggressive behaviours and the specific consequences for them as the most common targets of aggression (Whittington & Richter, 2006). It is a complex phenomenon involving a variety of causal factors. Some risk variables have been studied which are patient-related, such as the presence of schizophrenia, mania, a history of violence (Liu & Wuerker, 2005); service-related, such as overcrowding and lack of privacy (Jansen, Dassen, & Groot Jebbink, 2005); Professionals' training (Jonhson, 2004) or related to the care situation, such as conflicts in restraining and managing these violent behaviours (Bowers, 2009).

The complexity of this phenomenon requires different prevention and management responses (Irwin, 2006). In clinical practice, the use of psychopharmacological

and psychosocial interventions is common, and it is sometimes necessary to use restrictive methods. However, prevention also involves controlling environmental and communicational stress, which may be reduced through activities adapted to the patients' abilities and needs, such as AAI.

AAIs are defined as Any intervention that intentionally includes animals as part of a therapeutic or social ameliorative process (Kruger & Serpell, 2006). These interventions are divided into Animal-Assisted Activities (AAAs) and Animal-Assisted Therapy (AAT). According to the Delta Society (2008), one of the largest organisations responsible for certification of the animals involved in therapeutic programmes in the United States, AAAs were designed to provide opportunities for motivation, education, or recreation with the use of teams consisting of an animal and the respective handler that intervene in different social settings. AAAs are unstructured programmes consisting of periodic visits to an individual or group. The AAT is a structured activity aimed at improving the physical, socio-relational, emotional or cognitive functioning. It is performed by specialised healthcare professionals in different settings on an individual basis or in groups.

Among the different types of animals used in AAI (for example, dogs, cats and horses), dogs have been the subject of numerous studies developed in different healthcare settings, given their potential to provide psychosocial support. Some studies have been carried out in psychiatric contexts in order to assess the effects of using dogs to control aggressive behaviours and emotions and improve social skills and psychotic symptoms, particularly in patients with dementia (Majić, Gutzmann, Heinz, Lang, & Rapp, 2013), major depression (Hoffmann et al., 2009), anxiety, fear and depression (Barker, Pandurangi, & Best, 2003), and schizophrenia (Chu, Liu, Sun, & Lin, 2009; Lang, Jansen, Wertenaue, Gallinat, & Rapp, 2010). They represent the potential of AAI to influence behavioural change in inpatients by acting on the emotions and as a facilitator of social relationships.

## Hypothesis

(H1) - AAI have a positive impact on the frequency, nature and severity of inpatients' aggressive behaviours;  
(H2) - AAI have a positive impact on reducing inpatients' psychiatric symptoms;

(H3) - AAI's have a positive impact on changing some indicators of anger expression in inpatients.

## Methodology

A quasi-experimental study was carried out with two groups (an experimental group and a control group) in two short-term psychiatric units (one for women and another one for men) of a general university hospital.

Sample. Participants were selected according to the following inclusion criteria: aged between 18 and 65 years; moderate or high risk of violence assessed

using the Aggression and Violence Assessment Scale (Hamolia, 2006); and expected to remain hospitalised for more than three weeks. The following exclusion criteria were used: dog phobia and/or allergy, unwillingness to participate, having participated in the study at an earlier stage. Of the 52 selected participants, the first two cases assessed were assigned on a weekly basis to the experimental group and the second two to the control group (26 patients in each group). Thus, the procedures were undertaken in the 13 pairs of the experimental group. Both groups had similar socio-demographic and clinical characteristics (Table 1).

Table 1  
*Comparison of socio-demographic and clinical characteristics between both groups*

Socio-demographic characteristics		Experimental group (n= 26)		Control group (n= 26)		Comparative tests between groups
		sd	Mean	sd		
Mean						
Age (years)		35.92	13.18	34.54	9.84	t=0.429; p <sub>(50)</sub> =0.670
Gender		No.	%	No.	%	$\chi^2_{(1)}=0.000$ ; p=1.000
	Male	12	46.20	12	46.20	
	Female	14	53.80	14	53.80	
Marital status	Married or cohabiting	3	11.60	9	34.60	$\chi^2_{(2)}=4.558$ ; p=0.102
	Single	18	69.20	15	57.70	
	Widowed or separated	5	19.20	2	7.70	
Education	Basic	13	50.00	14	53.80	$\chi^2_{(2)}=1.141$ ; p=0.565
	Secondary	6	23.10	8	30.80	
	Higher	7	26.90	4	15.40	
Occupation	Senior-level position	5	19.23	5	19.20	$\chi^2_{(2)}=0.111$ ; p=0.946
	Non specialised professional	7	26.92	6	23.10	
	Unemployed or retired	14	53.85	15	57.70	
Clinical characteristics		No.	%	No.	%	
Mode of admission	Consultation	3	11.54	3	11.54	$\chi^2_{(2)}=0.168$ ; p=0.919
	Emergency	20	76.92	19	73.08	
	Legal order	3	11.54	4	15.38	
Prior hospitalisations	Yes	20	76.92	20	76.92	$\chi^2_{(2)}=0.000$ ; p=1.000
	No	6	23.08	6	23.08	

Risk of violence	Moderate	23	88.46	26	100.00	<i>Fisher</i> $p=0.235$
	High	3	11.54	-	-	
(First) Medical diagnosis	Psychotic disorders	14	53.84	12	46.16	$\chi^2_{(2)}=0.821$ ; $p=0.663$
	Mood disorders	10	38.46	10	38.46	
	Other disorders	2	7.70	4	15.38	

## Instruments

The adapted version of the State-Trait Anger Expression Inventory (STAXI-2; Marques, Mendes, & Sousa, 2007) was used. This inventory includes 54 items divided into four scales and five subscales. The State Anger and Trait Anger scales kept the original structure; the Anger Expression-In and Anger Expression-Out, as well as the Anger Control-In and Anger Control-Out scales were combined into the Anger Expression and Anger Control scales, respectively.

The Brief Psychiatric Rating Scale (BPRS) - Portuguese version (Ventura et al., 1993) was used. This scale includes 24 psychopathological items rated on a 7-point severity scale (*not present, very mild, mild, moderate, moderately severe, severe and extremely severe*). In addition to the overall assessment of psychiatric symptoms, this scale also assesses the Psychotic Index based on the sum of three items: hallucinations, changes in thought content and formal thought disorders.

The Staff Observation Aggression Scale-Revised (SOAR-R; Nijman, 1999) was also used. This scale encompasses five components: the provocation, the means used by aggressor, the target of aggression, the consequences for the victim, and the measures taken to stop aggression. The incidents are rated as *mild* (1-7 points), *moderate* (8-15 points) or *severe* (16-22 points). The SOAS-R was completed by the healthcare professionals who witnessed the aggressive behaviours soon after the situation is under control.

## Procedures

The experimental intervention was a programme based on the visit from a dog. It included group activities with two inpatients with the purpose of promoting contact with the animal and interaction with the partner. The sessions took place in two short-term psychiatric units (one for women and another one for men) and included 13 groups of two patients. The dog handler and a Nursing professional specialised in Psychiatric and Mental Health Nursing

(the researcher) participated in the sessions. Each group of two patients (pair) was visited by the dog twice a week, in a total of six sessions over the course of three weeks. Each session lasted 15 minutes. Some objects were used in the sessions: balls, dolls, brush, and clicker (an instrument used by the trainer for positive reinforcement of the dog), which were used as auxiliary tools to dynamise the sessions. The sessions were developed according to the patients' interests at the time, and supported by the guidance of the educator. To ensure the safety and comfort of those involved, similar resources were used in each unit: room, equipment, lighting, temperature and acoustics.

The team (volunteer/dog) was previously certified by the *Associação Portuguesa para a Intervenção com Animais de Ajuda Social - ÁNIMAS* (Portuguese Association for Intervention through Social Assistance Animals). The selected dog had the following characteristics: Labrador Retriever, female, four years old, yellow, calm, tolerant, and playful.

Before signing the consent form to participate in the study, the selected patients were informed about the intervention programme.

The field work was carried out with the permission of the Ethics Committee of the selected hospital and of the clinical direction of the selected psychiatric units. Data were collected before, during and three weeks after the implementation of the programme. In order to apply the State-Trait Anger Expression Inventory (STAXI-2; adapted by Marques et al., 2007) to the subjects, they were explained how to complete it. In case of omission at the time of data collection, the participant's doubts would be clarified and he/she asked to correct it. In order for the Nursing professionals (potential witnesses) to fill in the Staff Observation Aggression Scale-Revised (SOAR-R; Nijman, 1999), they were given some information regarding recording and codification.

After the instruments were applied, the obtained data were analysed using the statistical software

SPSS, version 13.5. The following comparative tests between groups were used: the Student's t-test for independent samples, the Mann-Whitney test, the Chi-square test, and the Fisher's test. The Student's t-test for paired samples was used to assess evolution in each group.

Results

Aggressive behaviours. Of the 52 selected patients, 17 displayed aggressive behaviours (6 in the experimental group and 11 in the control group; Table 2). This difference is not statistically significant ( $p > 0.05$ ).

Table 2  
*Comparison of the groups according to the number of individuals who displayed aggressive behaviours*

Aggressive behaviours	Experimental group (n= 26)		Control group (n= 26)		Differences between groups
	No.	%	No.	%	
Yes	6	23.10	11	42.30	$\chi^2_{(gl=1)} = 2.185$ $p = 0.139$
No	20	76.90	15	57.70	

By analyzing the characteristics of the displayed aggressive behaviours (Table 3), the following results were observed: Frequency. The patients in the experimental group (six) did not repeat aggressive behaviours, while most patients in the control group did (54.50%). This reflected a statistically significant difference between groups ( $p=0.043$ ) as patients who did not benefit from the programme repeated aggressive behaviours more often during hospitalisation; Nature. No statistically significant differences were observed, with the exception of the consequences for the victim (people), in which there were fewer cases in the experimental group (one; 16.70%) than in the control group (eight; 72.70%), and of the measures used to control aggression, particularly pharmacological measures, which were

less used in the experimental group (16.70%) than in the control group (72.70%), both revealing differences in the significance threshold ( $p=0.050$ ); Severity. The results obtained show that, of the six patients from the experimental group who displayed aggressive behaviours, four were recorded as mildly severe behaviours, two as moderately severe and none as severe behaviours. On the other hand, of the 11 patients from the control group, one presented mildly severe behaviours, six moderately severe behaviours and four severe behaviours, with significant differences between groups ( $p=0.028$ ). Using the Mann-Whitney test, significant differences ( $p=0.015$ ) were also revealed in the SOAS-R scale, as the experimental group where the AAI programme was applied presented a lower severity score.

Table 3  
*Comparison of the groups according to the characteristics of aggressive behaviours*

Characteristics of aggressive behaviours No.	Experimental group (n= 6)		Control group (n= 11)		Comparative tests between groups
	%	No.	%	No.	
No. of displayed aggressive behaviours					
1	6	100.00	5	45.50	Fisher $p=0.043$
> 1	-	-	6	54.50	
Nature: Provocation					
Other patients					
Observed	1	16.70	2	18.20	Fisher $p=1.000$
Help in satisfying basic needs					
Observed	-	-	1	9.10	Fisher $p=1.000$

Refusal of patients' requests by professionals						
	Observed	1	16.70	6	54.50	Fisher p=0.304
Ordering the patient to take medication						
	Observed	1	16.70	5	45.50	Fisher p=0.333
Nature: Means used by the patient to commit aggression						
Verbal						
	Observed	5	83.30	11	100.00	Fisher p=0.353
Parts of the body and everyday objects						
	Observed	2	33.30	8	72.70	Fisher p=0.353
Nature: Target of aggression						
Nurses	Observed	5	83.30	10	90.90	Fisher p=1.000
Others (patients, other professionals and family members)						
	Observed	1	16.70	7	63.60	Fisher p=0.131
Nature: Consequences for the victim						
Objects						
	Observed	1	16.70	-	-	Fisher p=0.353
	Not observed	5	83.30	11	100.00	
People						
	Observed	1	16.70	8	72.70	Fisher p=0.050
Nature: Measures used to control aggression						
Non-restrictive measures						
	Observed	5	83.30	6	54.50	Fisher p=0.333
Restrictive measures						
	Observed	2	33.30	8	72.70	Fisher p=0.162
Administration of medication						
	Observed	1	16.70	8	72.70	Fisher p=0.050
Severity: Classification						
	Mild	4	66.70	1	9.10	Fisher p=0.028
	Moderate	2	33.30	6	54.50	
	Severe	-	-	4	36.40	
		Mean	sd	Mean	sd	
SOAS-R (Nijman, 1999)		6.33	5.35	14.18	4.95	Mann-Whitney U=9.000 p=0.015

Psychiatric symptoms. The psychiatric symptoms were assessed (Table 4) by comparing the intra and intergroup results obtained in the first and second assessment with the overall score of the BPRS and the Psychotic Index. After the analysis of the results obtained in the overall score and in

the Psychotic Index, no statistically significant intergroup differences were found in the initial or in the final assessment. Both groups had a significant evolution ( $p=0.000$ ) as their psychiatric symptoms were improved.

Table 4  
*Comparison of the groups according to psychiatric symptoms*

BPRS: Overall score	Experimental group (n=26)		Control group (n=26)		Differences between groups
	Mean	sd	Mean	sd	
Initial assessment	55.92	12.42	50.73	11.31	$t_{(50)} = 1.576; p = 0.121$
Final Assessment	39.35	8.29	37.96	10.71	$t_{(50)} = 0.521; p = 0.605$
Differences between assessments	$t_{(25)} = 6.854$ $p = 0.000$		$t_{(25)} = 5.340$ $p = 0.000$		
Evolution /Group (final assessment-initial assessment)	-16.58	12.33	-12.77	12.19	$t_{(50)} = 1.120; p = 0.268$
BPRS: Psychotic Index					
Initial assessment	8.77	4.42	8.58	4.78	$t_{(50)} = 0.151; p = 0.881$
Final assessment	5.35	3.42	5.19	3.36	$t_{(50)} = 0.164; p = 0.871$
Differences between assessments	$t_{(25)} = 5.288$ $p = 0.000$		$t_{(25)} = 4.325$ $p = 0.000$		
Evolution/ Group (final assessment-initial assessment)	-3.42	3.30	-3.38	3.99	$t_{(50)} = 0.038; p = 0.970$

Anger experience and expression. By comparing the overall score obtained in each of the scales in the STAXI-2 (version adapted by Marques et al., 2007; Table 5) by both groups in both moments, no statistically significant differences were observed.

However, the experimental group showed a statistically significant decrease in the State Anger trait in the second assessment ( $p=0.010$ ), while in the control group this decrease is in the threshold of significance ( $p=0.072$ ).

Table 5  
*Comparison of the groups according to anger experience and expression*

STAXI-2	Experimental group (n=26)		Control group (n=26)		Differences between groups
	Mean	sd	Mean	sd	
STAXI-2: State					
Initial assessment	23.27	10.96	21.04	5.34	$t_{(gl=50)} = 0.933; p = 0.355$
Final assessment	18.08	5.10	18.88	4.38	$t_{(gl=50)} = -0.612; p = 0.543$
Differences between assessments	$t_{(gl=25)} = 2.794$ $p = 0.010$		$t_{(gl=25)} = 1.875$ $p = 0.072$		
Evolution /Group (final assessment- -initial assessment)	-5.19	9.47	-2.15	5.86	$t_{(gl=50)} = 1.391; p = 0.170$
STAXI-2: Trait					
Initial assessment	18.00	5.54	17.92	3.72	$t_{(gl=50)} = 0.059; p = 0.953$
Final assessment	15.77	5.76	17.27	4.12	$t_{(gl=50)} = -1.079; p = 0.286$
Differences between assessments	$t_{(gl=25)} = 1.787$ $p = 0.086$		$t_{(gl=25)} = 0.950$ $p = 0.351$		
Evolution/ Group (final assessment- -initial assessment)	-2.23	6.36	-0.65	3.51	$t_{(gl=50)} = 1.106; p = 0.274$
STAXI-2: Anger Expression					
Initial assessment	23.27	5.48	24.85	7.48	$t_{(gl=50)} = -0.867; p = 0.390$
Final assessment	21.42	5.74	22.96	5.14	$t_{(gl=50)} = -1.018; p = 0.313$
Differences between assessments	$t_{(gl=25)} = 1.313$ $p = 0.201$		$t_{(gl=25)} = 1.544$ $p = 0.135$		
Evolution/ Group (final assessment- -initial assessment)	-1.85	7.17	-1.88	6.22	$t_{(gl=50)} = 0.021; p = 0.984$



STAXI-2: Anger Control					
Initial assessment	39.69	10.29	42.38	10.33	$t_{(gl=50)} = -0.941; p = 0.351$
Final assessment	40.04	8.97	40.38	7.56	$t_{(gl=50)} = -0.150; p = 0.881$
Differences between assessments	$t_{(gl=25)} = -0.198$ $p = 0.844$		$t_{(gl=25)} = 1.016$ $p = 0.319$		
Evolution/ Group (final assessment- -initial assessment)	0.35	8.89	-2.00	10.04	$t_{(gl=50)} = 0.892; p = 0.377$

## Discussion

This study aimed to assess the benefits of an AAI (dog) programme for acute psychiatric inpatients, as a factor for prevention and control of high-risk feelings and emotions. The following were considered violence prevention indicators in this context: the frequency, nature and severity of aggressive behaviours, the psychiatric symptoms and the variables related to anger experience and expression by acute inpatients in short-term psychiatric units and classified as being in risk of developing aggressive behaviours.

In general, and although some of the results, such as those related to the expression of aggressive behaviours, were not conclusive due to the small sample size and the small number of observed incidents throughout the programme, some evidence was found to support the advantages of an AAI on the frequency, nature and severity of the aggressive behaviours of acute psychiatric inpatients. This conclusion was drawn based on the results obtained in the experimental group, in which fewer patients displayed aggressive behaviours and behaviours were less often repeated. In addition, the incidents in the experimental group were less severe and had fewer consequences on the victims, thus requiring less medication to control these behaviours.

Some studies in this area have shown the effectiveness of AAIs for preventing aggressive incidents (Majić et al., 2013).

The results also suggest its usefulness in preventing the impact of the phenomenon of violence on acute psychiatric inpatients, including the possibility for prevention of costs associated with the use of medication to control them. Therefore, one of its previously mentioned advantages – the use of less medication – is strengthened (Connor & Miller, 2000). On the other hand, the results showed no differences in terms of psychiatric symptoms and anger experience and expression between both groups. However, it

should be highlighted that the experimental group showed less state anger and higher anger control than the control group, in which only state anger decreased. One of the possible conclusions is that these variables were mainly affected by medical treatment.

As for psychiatric symptoms, it should be noted that both groups were subjected to a psychopharmacological treatment, considering that they were both in an acute stage of the illness. It would not be ethically acceptable to propose not to apply it. Besides, the programme under analysis did not intend to compete with the ongoing conventional interventions. Rather, the intention was for the programme to complement them so as to prevent violence in similar contexts and, as a consequence, promote a safer environment. Therefore, the observed decrease of symptoms cannot be considered to be a result of the implemented AAI programme. Some evidence on its effects on the expression of positive symptoms can be found in the empirical literature on this topic (Chu et al., 2009).

Although the results do not fully corroborate the hypothesis that AAAs (dog) have a positive impact on anger experience and expression, there is some evidence on their influence in the prevention of aggressive behaviours, as the observed differences relate to the anger state and control factors which are clearly associated with triggering these behaviours. Some evidence on their impact on anger control can be found in the empirical literature on this topic (Barker et al., 2003).

The study had the following limitations: those related to clinical and psychological data collection strategies (for example, observation and record of aggressive behaviours), whose application required the participation of professionals who were naturally influenced by the subjective nature of the variable and their personal availability to fill in the instrument; and those related to the composition of teams for both groups, which involved the existence of some



unsuccessful pairs (when one of the members wished to withdraw from the programme) and affected sample size.

## Conclusion

With respect to the effectiveness of the AAI (dog) programme for acute psychiatric inpatients, the results obtained in the prevention of aggressive behaviours, especially in terms of their frequency and nature (less consequences and less use of control medication), should be highlighted. The results obtained in the experimental group, which benefited from the programme, should also be emphasised given the decrease in the state anger. Furthermore, the promotion of a more humane therapeutic environment should also be highlighted. Further research is needed to support the effectiveness of AAI (dog) programmes for preventing violence in psychiatric settings, as well as investment in the control of risk factors, namely anger.

## References

- Barker, S. B., Pandurangi, A. K., & Best, A. M. (2003). Effects of animal-assisted therapy on patients' anxiety, fear, and depression before ECT. *The Journal of ECT*, 19(1), 38-44.
- Bowers, L. (2009). Association between staff factors and levels of conflict and containment on acute psychiatric wards in England. *Psychiatric Services*, 60(2), 231-239. doi: 10.1176/appi.ps.60.2.231
- Chu, C. I., Liu, C. Y., Sun, C. T., & Lin, J. (2009). The effect of animal-assisted activity on inpatients with schizophrenia. *J Psychosoc Nurs Ment Health Serv*, 47(12), 42-48.
- Connor, K., & Miller, J. (2000). Animal-assisted therapy: An in-depth look. *Dimensions of Critical Care Nursing*, 19(3), 20-26.
- Delta Society (2008). Pet partners team training course manual (7<sup>th</sup> ed.). Bellevue, WA: Delta Society.
- Hamolia, C. D. (2006). Prevención y tratamiento de la conducta agresiva. In G. Stuart, & M. Laraia, *Enfermería psiquiátrica: Principios y práctica* (pp. 630-653). Madrid, España: Elsevier.
- Hoffmann, A. O., Lee, A. H., Wertenauer, F., Ricken, R., Jansen, J. J., Gallinat, J., & Lang, U. E. (2009). Dog-assisted intervention significantly reduces anxiety in hospitalized patients with major depression. *European Journal of Integrative Medicine*, 1(3), 145-148. doi: 10.1016/j.eujim.2009.08.002
- Irwin, A. (2006). The nurse's role in the management of aggression. *Journal of psychiatric and mental health nursing*, 13(3), 309-318. doi: 10.1111/j.1365-2850.2006.00957.x
- Jansen, G. J., Dassen, T. W., & Groot Jebbink, G. (2005). Staff attitudes towards aggression in health care: A review of the literature. *Journal of Psychiatric and Mental Health Nursing*, 12(1), 3-13. doi: 10.1111/j.1365-2850.2004.00772.x
- Johnson, M. E. (2004). Violence on inpatient psychiatric units: State of the science. *Journal of the American psychiatric nurses association*, 10(3), 113-121. doi: 10.1177/1078390304264959
- Kruger, K. A. & Serpell, J. A. (2006). Animal-assisted interventions in mental health: Definitions and theoretical foundations. In A. Fine (Ed.), *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice* (2<sup>nd</sup> Ed.) (pp. 21-38). San Diego: Academic Press.
- Lang, U. E., Jansen, J. B., Wertenauer, F., Gallinat, J., & Rapp, M. A. (2010). Reduced anxiety during dog assisted interviews in acute schizophrenic patients. *European Journal of Integrative Medicine*, 2(3), 123-127. doi: 10.1016/j.eujim.2010.07.002
- Liu, J., & Wuerker, A. (2005). Biosocial bases of aggressive and violent behavior: Implications for nursing studies. *International Journal of Nursing Studies*, 42(2), 229-241. doi: 10.1016/j.ijnurstu.2004.06.007
- Majić, T., Gutzmann, H., Heinz, A., Lang, U. E., & Rapp, M. A. (2013). Animal-assisted therapy and agitation and depression in nursing home residents with dementia: A matched case-control trial. *The American Journal of Geriatric Psychiatry*, 21(11), 1052-1059. doi: 10.1016/j.jagp.2013.03.004
- Marques, M. I. D., Mendes, A. C., & De Sousa, L. (2007). Adaptação para português do inventário da expressão da ira estado-traço (STAXI-2) de Spielberger. *Psicologica*, 46, 85-104.
- Marques, M. I. D., Mendes, A. C., & De Sousa, L. (2010). Comportamentos agressivos de doentes hospitalizados em contexto psiquiátrico. In E. Santos, J. Ferreira, P. Santos, J. Leitão, R. David, C. Figueiredo, .... J. Almeida (Eds.), *Aconselhamento na saúde: Perspetivas integradoras* (pp. 121-146). Viseu, Portugal: Psicossoma.
- Nijman, H. L. I. (1999). *Aggressive behaviour of psychiatric inpatients: Measurement, prevalence, and determinants*. Maastricht, Netherlands: University Press Maastricht.
- Nijman, H. L. I., Palmstierna, T., Almvik, R., & Stolker, J. J. (2005). Fifteen years of research with the Staff Observation Aggression Scale: A review. *Acta Psychiatrica Scandinavica*, 111(1), 12-21. doi: 10.1111/j.1600-0447.2004.00417.x
- Ventura, J., Lukoff, D., Nuechterlein, K., Liberman, R. P., Green, M. F., & Shaner, A. (1993). *Brief psychiatric rating scale (BPRS): Expanded version 4.0*. Unpublished manuscript. Department of Psychiatry and Biobehavioural Sciences, University of California, Los Angeles, USA.
- Whittington, R., & Richter, D. (2006). *Violence in mental health settings: Causes, consequences, management*. New York, NY: Springer.

