



Post-traumatic stress disorder: sensorimotor intervention protocol with the dog

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Abstract: Animal assisted interventions are part of complementary and alternative interventions intended as a diversified set of treatments and practices applied to both physical and mental health.

The aim of the study was to investigate emotional dysregulation and alexithymia in the reference population with the inclusion of the animal in the sensorimotor psychoeducational protocol and the modality of interference of traumatic symptoms on dysregulation.

This article describes the results from a randomized pilot study with a control and single-center experimental group to evaluate the effectiveness of a 6-meeting psychoeducational sensorimotor protocol with insertion of the dog as an additional variable in Odgen and Fischer’s sensorimotor therapy protocol.

The study involved 13 patients diagnosed with PTSD aged 10-16 years and who had completed the pre-test and post-test phase with administration of the *Toronto Alexithymia Scale – 20 (TAS-20)* and *Trauma Symptom check list for children, TSCC – A*.

The study made it possible to derive interesting qualitative clinical considerations, in fact, the participants who completed the program showed an improvement in relational and compliance with the therapists, a greater verbal expression and a greater behavioral and physiological stabilization. The study lays the foundations for future studies on the subject.

Key Words: Trauma, PTSD, sensorimotor, animal assisted therapy, children

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Introduction

Post-traumatic stress disorder (PTSD) (American Psychiatric Association, 2013) can develop as a result of external or natural traumatic events or of an interpersonal nature. Especially interpersonal trauma leads the individual to live in constant anxiety, numbness and a persistent and abiding distrust of others (Parish-Plass, 2013). Relationships are necessary to heal from trauma, however, numerous studies indicate the difficulty of trauma victims in establishing new, even therapeutic, relationships. The presence of animals, however, seems to favour the establishment of relationships in individuals who have been traumatised (Parish-Plass, 2013).

The relationship with the animal is perceived as a potential space (Winnicott, 1971) safe and reliable in which to play, be worry, be frightened, get angry, miss. The patient also has the possibility to observe the relationship of the therapist with the animal. It is likely that especially children victims of trauma, once understood that the therapist is a base and a safe haven for the animal, identify with the animal itself allowing a lowering of defenses and finding in the therapist also a base and a refuge (Winnicott, 1971).

In an animal therapy setting, the number of relationships increases in proportion to the number of animals and this provides a richer context and encourages the creation of a real and concrete relational matrix (Ish-Lev & Amit, 2013).

The animal in general provides emotional security, psychophysiological activation, affective regulation and behavioural modifications in relation to the social environment (Parish-Plass, 2013).

Moreover, working with the animal presents itself as a neurophysiological approach whereby limbic circuits appear to react rapidly to interaction facilitated by the animals’ proximity, touch, warmth and reactivity.

The ventral system together with the hippocampus and amygdala are activated in response to interaction with the animal (Yorke, 2020). In addition, such interactions promote the release of endorphins and increase oxytocin levels with a decrease in feelings of pain, loneliness and isolation (Mims, 2016).

Most therapists say that one of the most important components of therapy for traumatised people is work on the regulation of arousal (Odgen et al., 2006).

Animal contact encourages the exploration of rootedness resources that can be used to regulate arousal (*hypo and hyper arousal*) and allows us to define the importance of the physical border that is tangible, touchable and visible (Odgen et al., 2006).

The most common and effective psychological therapies currently used in situations of trauma and dissociation include cognitive behavioural therapy, desensitisation and EDMR (*Eye Movement Desensitization and Reprocessing*), NET (*narrative exposure therapy*) and others; however, therapists agree that there is a need for new alternative and complementary therapies.

For this reason, animal-assisted interventions for patients with PTSD are opportunities for study and research.

This study primarily aims to find out how emotional dysregulation and alexithymia change in the reference population with the inclusion of an animal (dog) in Odgan and Fisher's sensorimotor psychoeducational protocol (Odgen et al., 2006).

The secondary objective is to investigate whether the variation in emotional dysregulation was moderated by trauma-related symptomatology and how different trauma symptomatology impact on emotional dysregulation.

Methods

The study was conducted on a sample of 13 patients living in a juvenile community in the province of Venice, Italy (10-16 years-old with a diagnosis of post-traumatic stress disorder).

The suitability of the patients to participate in the study was determined by a multidisciplinary team composed of a chief psychotherapist, a psychologist and educators of the community.

Allergy and phobia to animals were the exclusion criteria.

For participants, being minors, it was collected a written informed consent signed by parents or by the person with parental responsibility.

Participants were asked to complete at time T0 (1 week before the start of the test) and time T1 (1 week after the end of the test) two questionnaires:

- Toronto Alexithymia Scale -20 (TAS-20)
- Trauma Symptom check list for children, TSCC-A.

The psycho-educational protocol used was derived from some exercises from Odgan and Fisher's sensorimotor therapy protocol (Odgen et al., 2006) and was adapted so that it could be delivered with (or without) the dog variable.

The protocol consisted of 6 interventions without the dog in the control group and 6 interventions with integration of the dog in the experimental group. All meetings lasted 60 minutes.

The protection of human and animal welfare is guaranteed by the IAA Guidelines of the Ministry of Health (Linee Guida Nazionali IAA, 2015), by the internal protocols of "La Terra di Hope" and by the supervision of the Ulss 3 Serenissima veterinary services.

The animals were also chosen for physical and relational characteristics adapted to the target audience in terms of age and pathology.

Furthermore, the selection of the two dogs was made by the researchers who wanted two subjects with opposite morphological and character characteristics.

Therefore, it was chosen a Cavalier King (male) and a crossbreed between a Corso and a Pit Bull terrier (male).

Results

A statistical power analysis was performed with G*Power currently available in 3.1.2 version (Faul, 2019).

In order to define the sample, the family F-test ANOVA with repeated measures was carried out (effect size $f = 0.25$, err prob = 0.05, power $1 - \beta = 0.80$). From these results, a sample of 34 subjects was obtained.

However, logistical difficulties prevented the inclusion of some users, which significantly reduced the number of users in the study.

The required sample size was reduced from a minimum of 34 subjects to an actual sample size of 13 subjects. The power was then calculated on the 13 subjects with effect size $f = 0.25$, err prob = 0.05, resulting in a power $1 - \beta = 38\%$.

In order to summarise the main characteristics of the sample (gender, age, scale score), descriptive statistics were carried out by means of frequency distributions for the qualitative variables.

The homogeneity of the groups at baseline was checked with the corresponding non-parametric t-Student test (Mann-Whitney) for quantitative variables not normally distributed with a significance of 0.05. As the experimental design was before and after the sensorimotor psycho-educational treatment (with or without dog and same subjects), the analysis of variance for repeated measures was carried out.

A generalised linear model for repeated measures (ANOVA for repeated measures) was used as the analysis model.

Specifically, an initial model was evaluated to study only the main effect of the pattern of emotional dysregulation in the experimental group compared to the pre- and post-intervention control group. Seven models (ANOVA for repeated measures) were then evaluated to study the interaction of dysregulation on trauma symptoms. Analyses were performed with SPSS software and a significance level of $p < 0.05$ was considered.

The two samples were tested using the Mann-Whitney test and there were no significant differences between the control group and the experimental group with regard to the level of emotional dysregulation at time T0, i.e. before the psycho-educational intervention ($U = 27,500$, with $p = 0.284$). With regard to trauma-related symptoms, the two groups have no significant differences about anxiety ($U = 23,000$ with $p = 0.724$) depression ($U = 27,000$ with $p = 0.354$), post-traumatic stress ($U = 28,000$ with $p = 0.284$), dissociation ($U = 25,500$ with $p = 0.435$) DIS_A ($U = 24,000$ with $p = 0.622$) and DIS_F ($U = 26,000$ with $p = 0.435$). With regard to rabies, the two groups, control and experimental, are not homogeneous, so the null hypothesis must be rejected ($U = 40,000$ with $p = 0.002$).

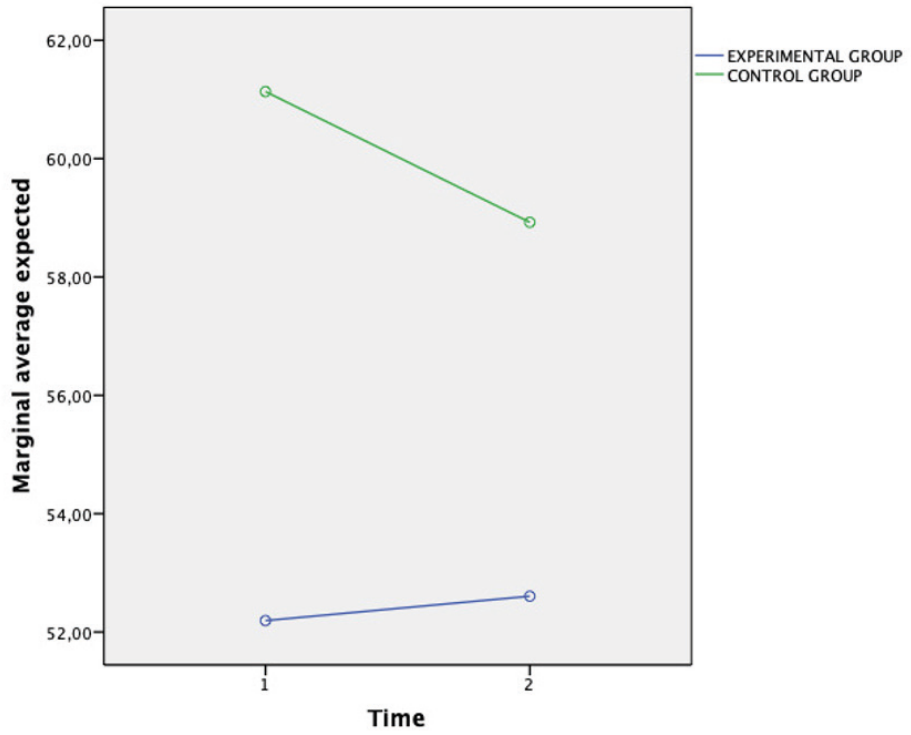
The TAS-20 did not appear to change overall in the time before and after the psychoeducational intervention ($F = 0.106$ with $p = 0.750$). Furthermore, the time-to-group interaction (factor $1 * \text{group}$) indicates that TAS-20 did not change differently in the pre- and post-intervention time between the two groups $F = 0.212$ with $p = 0.654$.

Then there appears to be no difference between the experimental group who received the intervention with the dog and the control group with regard to the level of emotional dysregulation pre- and post-intervention.

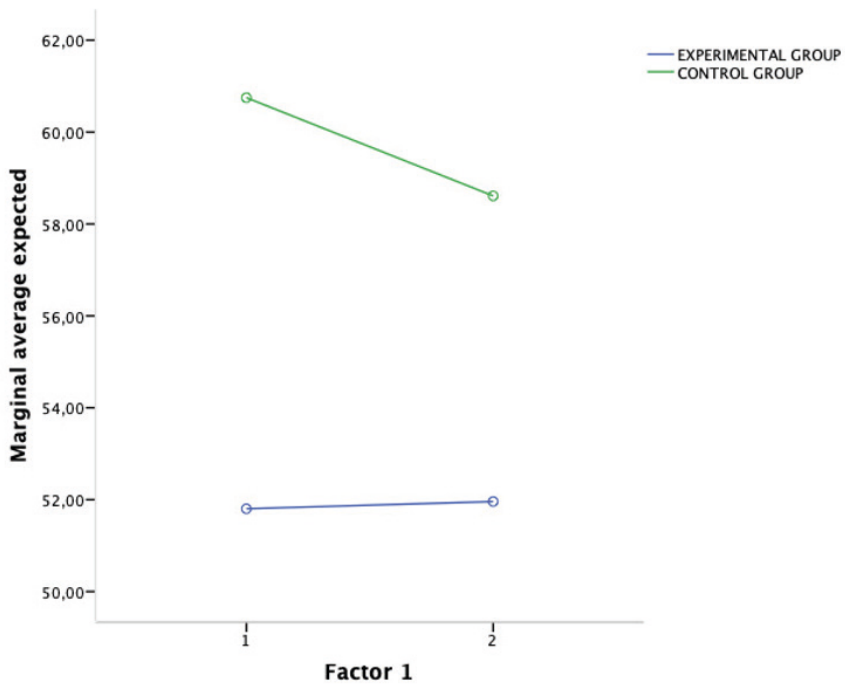
Graph n. 1 shows a decrease in the TAS-20 score at post in the control group and an increase in scores in the experimental group.

All the different symptoms related to post-traumatic distress detected with the TSCC-A were considered. For each symptom the variation between pre and post psycho-educational intervention was considered, meaning by variation the difference of the scale score.

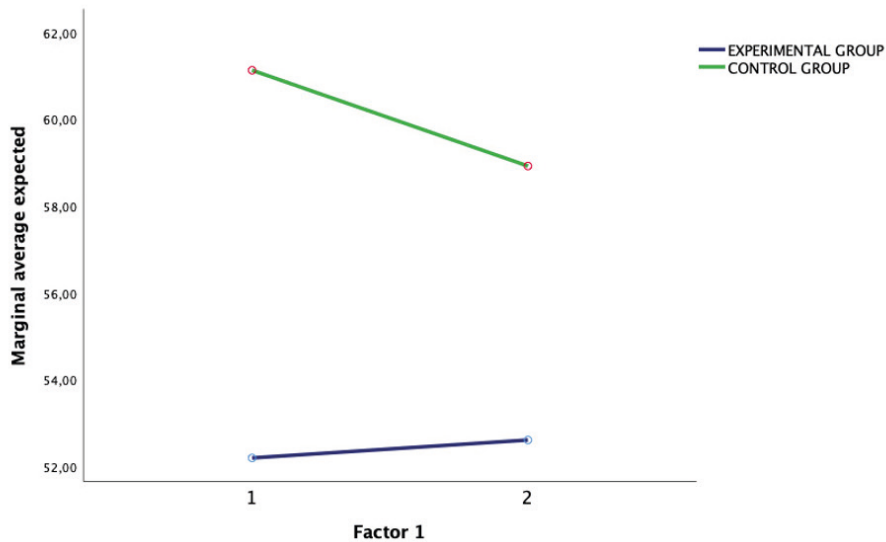
The interaction of the various symptoms with emotional dysregulation showed that anxiety, anger and dissociation interacted with dysregulation in the same way in the experimental group as in the control group, while depressive symptoms (graph 2) and post-traumatic stress (graph 3) showed a difference between the two groups.



Graph 1



Graph 2: Marginal averages TAS_20 pre- and post-intervention in interaction with depression scale (DEP) TSCC_A



Graph 3: Marginal averages TAS_20 pre and post intervention in interaction with post-traumatic stress scale (PTS) TSCC_A

Specifically, in the experimental group, the interaction between symptoms and TAS-20 seems to be more consistent, i.e. a decrease in the level of symptoms corresponds to a decrease in the levels of emotional dysregulation, whereas in the control group the opposite occurs.

Out of five symptoms in the experimental group, three seem to show a consistent pattern (as the symptom level decreases, the level of dysregulation decreases and as the symptom increases, the dysregulation increases), whereas in the control group only one symptom interacts consistently with the TAS-20.

In general, it seems that the experimental group with regard to anxiety, depression and post-traumatic stress presents a coherence between the positive or negative modification of the symptoms detected with TSCC_A and the consequent modification of the values of emotional dysregulation in a positive or negative sense detected with TAS_20; this coherence does not seem to emerge in the control group. This study was not statistically significant because of the reduction in sample size and the consequent loss of the power expected in the study design.

However, the change in pre- and post-symptoms detected with the TSCC-A and the change in emotional dysregulation values detected with the TAS-20 would seem to indicate that the psycho-educational intervention with the dog improves coherence by affecting emotional regulation.

Discussion

A critical issue in the study was the small sample size which affected the statistical results.

This criticality stemmed both from the complexity of finding a reference population with specific characteristics (minors and PTSD diagnosis) and from the clinical history and age of the participants; this made compliance difficult in the absence of the animal as a relational motivator.

Actually, there is little scientific evidence concerning the use of animals in the treatment of children diagnosed with PTSD and no protocols or recommendations regarding AAI and PTSD to refer to.

The methodological approach of the study was adequate as it was based on the sensorimotor

protocol in the treatment of PTSD (Odgen and Fisher) and used standardised protocols and procedures for AAI ensuring good control of the variables.

A satisfactory result emerges from the presence of the animal that would seem to promote consistent emotional stabilisation by lowering levels of emotional dysregulation and the consequent lowering of levels of PTSD-specific symptoms. The most interesting aspect of the study was the confirmation of qualitative clinical hypotheses concerning the use of animals in the psycho-educational setting.

In a study it was shown that an intervention with a dog is a valuable support to other interventions in patients with mental retardation and severe neurological impairment (D'Andrea et al., 2010). The improvement achieved was an increase in attention span, verbal comprehension and an enhancement of language skills.

The aim of dog-mediated psycho-educational interventions is to use educational reference opportunities in a purposeful way to foster an increase in imaginative vocabulary and communication skills, decrease distrust of diversity, promote empathy and problem-solving skills (Merenda, 2014).

The animal, as can be seen from the available literature, seems to have favoured the establishment of a relationship in a spontaneous way between the participants, the researchers and the operators.

This was evident in the difference noted by the researchers between the behaviour and attitudes of the experimental group and the control group.

Within the experimental group, the preliminary knowledge provided during the first session was spontaneous and fluid and curiosity and interest in the animal prevailed. This subsequently allowed compliance to be consolidated and maintained. This was not the case with the control group, which was immediately distrustful, unwilling to relate, bored and uncooperative.

It is possible that the absence of the animal made the perception of the proposed intervention more clinical and medicalised.

The presence of the animals in the experimental group also favoured the verbal expression created inside and outside the psycho-educational setting, which did not occur in the control group.

The dog, thanks to a climate of trust, allowed the group to build a safe place in which to talk about their experiences.

This made it possible to recall past memories, allowing the group to function as a container.

The presence of the animal also seems to have stabilised behaviour (no physical or verbal aggression, no escape, reduced kinetic activation, etc.), probably linked to the participants' relaxation resulting from physical contact with the animal and the consequent modification of the physiological parameters linked to stress (cortisol, blood pressure, etc.).

Conclusion

The study focused on the use of animals in psychology in order to promote future research projects but also to make clinicians aware of this new possibility of using dogs in 'traditional' therapy and rehabilitation. This study suggests, with cautious optimism, that animal interaction could prove to be an interesting tool to include within existing protocols for the treatment of PTSD.

However, more statistical samples are needed. The results also suggest that attention should be paid to the use of animals in clinical settings, especially in the treatment of psychological trauma, considering all factors of the human mind in human-animal interaction.

Each animal finds its own specific place in the individual and collective psychic space and for this reason the therapist must necessarily take this into account, as well as considering how the animal can arouse sensations and bring back unexplored unconscious experiences connected to the first relationships.

For all that has been said and widely discussed, it emerges that the animal, rather than a simple relational mediator, is in a therapeutic setting an amplifier that can both promote and hinder the treatment process.

Ethical consideration

Respondents, parents and those with parental responsibility were informed about confidentiality and anonymity of participation in accordance with privacy laws.

It did not seem necessary, given the type of study and the presence of the lead psychotherapist, to request formal ethical approval but the study was conducted in accordance with the Helsinki Declaration.

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Conflict of interest

The Authors declare no conflict of interest

Author contribution

The Authors contributed equally to the work.

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Disturbo da stress post-traumatico: protocollo di intervento sensomotorio con il cane

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Sintesi

Gli interventi assistiti dagli animali fanno parte di interventi complementari e alternativi intesi come un insieme diversificato di trattamenti e pratiche applicate sia alla salute fisica che mentale.

Lo scopo dello studio è stato quello di indagare la disregolazione emotiva e l'alessitimia nella popolazione di riferimento con l'inclusione dell'animale nel protocollo psicoeducativo sensomotorio e la modalità di interferenza dei sintomi traumatici sulla disregolazione.

Questo articolo descrive i risultati di uno studio pilota randomizzato con un gruppo sperimentale di controllo e monocentrico per valutare l'efficacia di un protocollo psicoeducativo sensomotorio a 6 incontri con inserimento del cane come variabile aggiuntiva nel protocollo di terapia sensomotoria di Odgen e Fischer.

Lo studio ha coinvolto 13 pazienti con diagnosi di disturbo da stress post-traumatico di età compresa tra 10 e 16 anni e che avevano completato la fase pre-test e post-test con la somministrazione della Toronto Alexithimia Scale – 20 (TAS-20) e della check list Trauma Symptom for children, TSCC – UN.

Lo studio ha consentito di trarre interessanti considerazioni cliniche qualitative, infatti i partecipanti che hanno portato a termine il programma hanno mostrato un miglioramento relazionale e di compliance con i terapeuti, una maggiore espressione verbale ed una maggiore stabilizzazione comportamentale e fisiologica. Lo studio pone le basi per futuri studi sull'argomento.