

## INTRODUCTION

In recent years, Animal-Assisted Interventions (AAI) have received considerable attention due to the potential benefits they provide to different categories of people. [1-2]. Concurrently there has been a growing interest in the welfare of animals involved in these activities [3]. However, data are still lacking. This study aims at monitoring the welfare of 9 dogs involved in Animal-Assisted Education activities at two nursing homes in Lucca (Italy). The research was funded by the IN-HABIT project H2020 (grant number 869227). IN-HABIT is a Horizon 2020 project, that aims at implementing visionary and integrated solutions to foster inclusive health and wellbeing in small and medium size cities with a focus on gender and diversity.

Lucca's case study looks at the human-animal relationship as a resource to improve the well-being and the quality of life of both parties in the urban environment. Among other goals, IN-HABIT implemented solutions specifically aimed at elders and vulnerable people, like projects of AAI in nursing homes or specifically designed services to help people take care of their pets in periods of needs.

## MATERIALS AND METHODS

Nine dogs were evaluated for physiological (heart rate, blood pressure, and rectal temperature), endocrine (saliva oxytocin and cortisol concentrations), and behavioural parameters (occurrence of stress signals). Parameters were collected at three time points: at home (basal), at the beginning of the project and at follow up (after 7-8 sessions), before and after activities (T0 and T1). Statistical analyses comprise descriptive (percentiles and normality test) and non-parametric (Wilcoxon rank test;  $p < 0.05$ ) analysis.



Figure 1: Some photos of the Animal Assisted Education carried out in the nursing homes.



Figure 2: Saliva collection with swab in dogs



Figure 4: Blood pressure and heart rate measurement

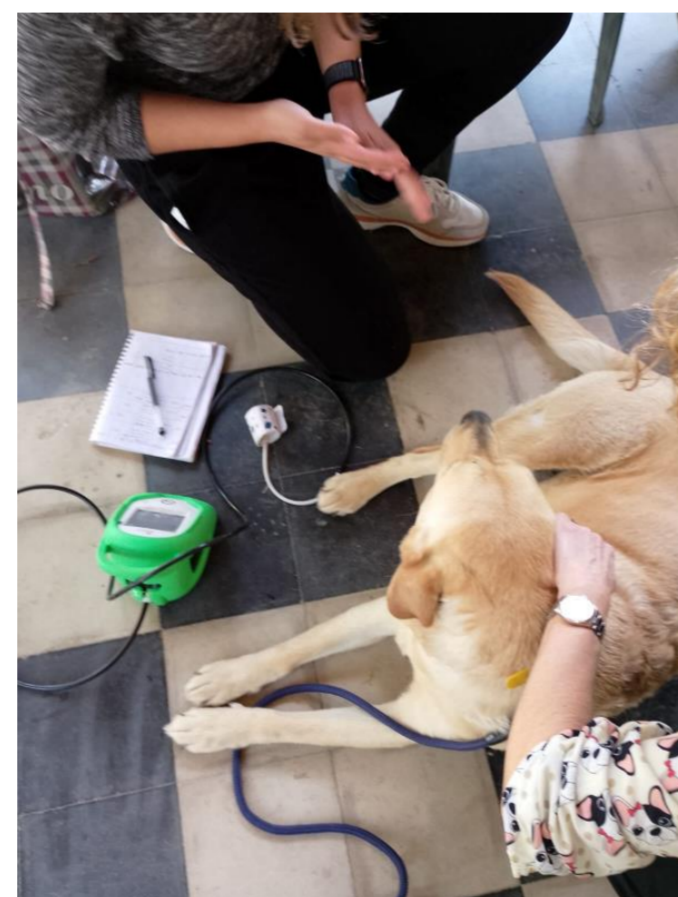


Figure 3: Collection of physiological parameters

## RESULTS

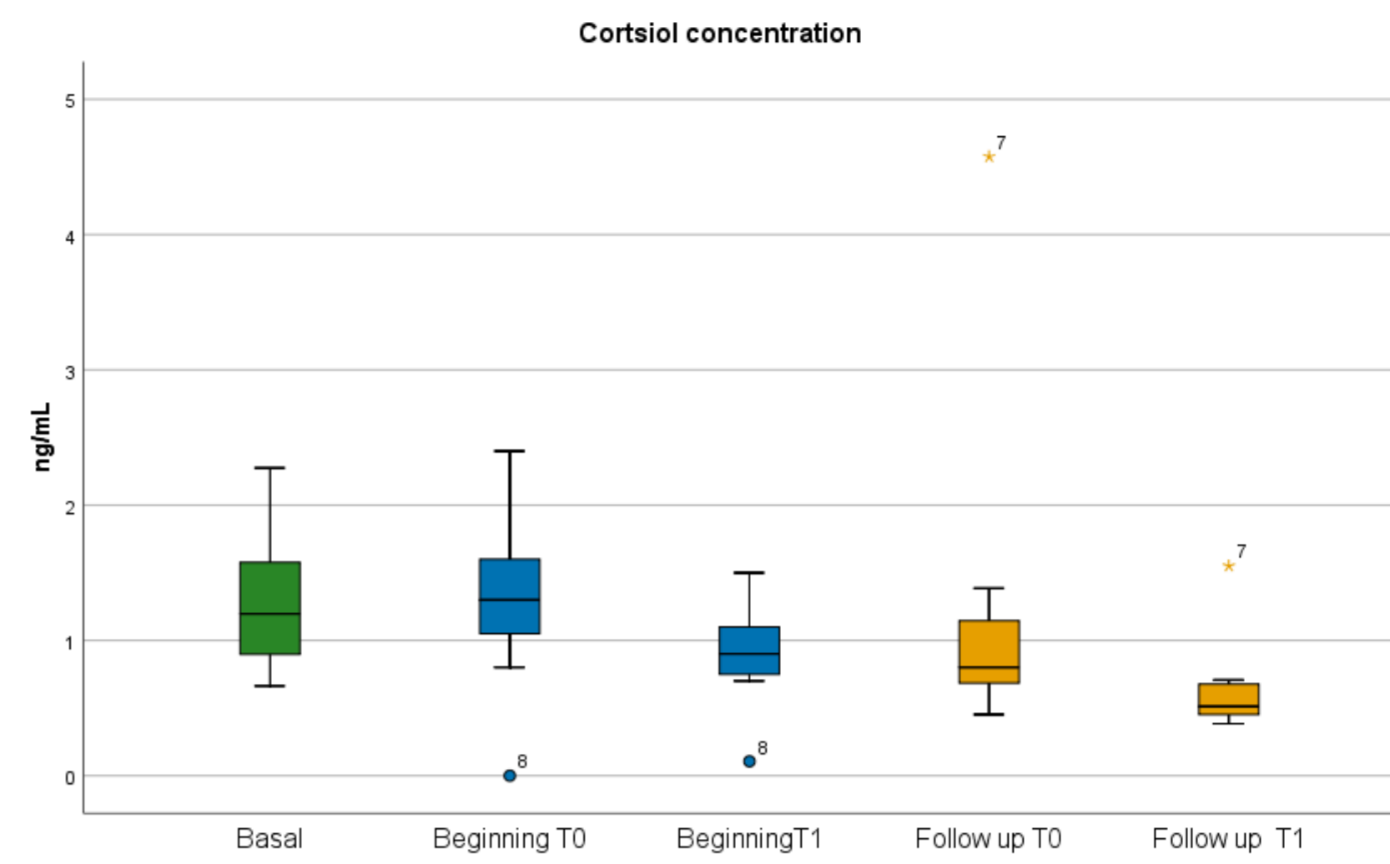


Figure 5: Boxplot for cortisol concentrations; comparison between basal, beginning of the project and follow up collections, before and after intervention (T0 and T1)

Dogs' cortisol concentrations (ng/mL) significantly decreased between basal and T1 samples both at beginning of the project ( $p=0.021$  basal median= 1.2; T1= 0.9) and at follow up ( $p=0.028$  T1 median= 0.51; ). Figure 5.

In addition, a significantly decrease was found between T0 and T1 samples both at beginning ( $p= 0.021$  T0 median= 1.3; T1=0.9) and at follow up ( $p=0.028$  T0 median=0.8; T1= 0.51).

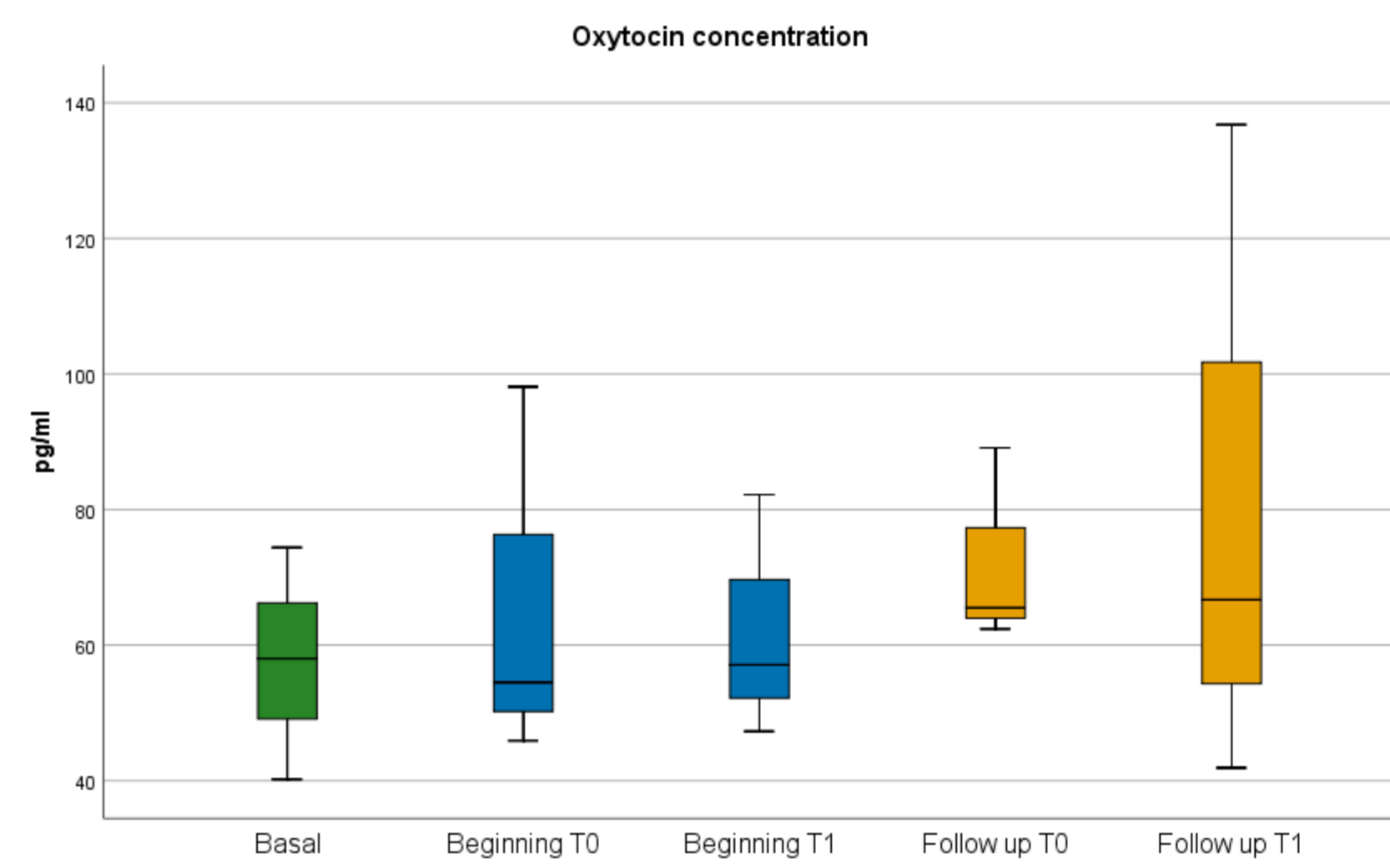


Figure 6: Boxplot for oxytocin concentrations; comparison between basal, beginning of the project and follow up collections, before and after intervention (T0 and T1)

Oxytocin concentration tended to increase throughout the collection (from basal to follow up). Figure 6.

Physiological data did not report any significant differences, nevertheless a high variability for basal heart rate was observed compared to T0 and T1.

Occurrence of stress behaviour were not correlated with saliva cortisol concentration.

## DISCUSSION

The findings from this study suggest that the dogs did not experience significant stress during Animal Assisted Education sessions, as reported by the significant decrease in cortisol concentrations after the sessions. Similar results were found by McCullough et al. [4]. In addition, the significant decrease in cortisol from basal to T1 and from T0 to T1 might report that the sessions were not only non-stressful but potentially beneficial in reducing stress level in dogs.

The elevated cortisol concentration at T0, compared to basal level may be linked to the extended car travel (more than 1 hour) to the nursing homes. Despite this initial increase, the subsequent decrease in cortisol post-session underscores the effectiveness of the handlers in safeguarding the dogs' welfare during the interactions.

The observed trend of oxytocin levels, although not statistically significant, suggests a potential positive effect of human interaction during AAls, supporting the findings by Beetz et al. [5] who reported increased oxytocin levels in dogs during positive interactions with humans. The lack of significant physiological changes indicates that this kind of measures alone may not fully capture the welfare status of dogs after AAls.

## CONCLUSIONS

Overall, our results contribute to the growing body of evidence that well-managed AAls do not compromise the welfare of participating dogs. Further research should investigate the impact of external factors such as travel to better understand and mitigate potential stressors for dogs involved in AAls.

## REFERENCES

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