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## **The influence of management on horse behavioural reactivity in therapeutic riding programs.**

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We investigated 8 horses in five therapeutic riding centres situated in San Cataldo (Caltanissetta - I), Nicosia (Catania - II), Pellaro (Reggio Calabria - III), San Gregorio (Catania - IV), Niguarda Hospitals (Milan - V). The managements of the animals were of different typologies: Type 1, Type 2 and Type 3. In type 1 the horses were used for therapeutic riding only. Furthermore intra and interspecific social interactions were not allowed. In type 2 the horses played kinetic activities and made social interactions. In type 3 the horses were free in paddock, as intra and interspecific social interactions were allowed. The centre I, with a management of type 1, housed 1 horse (A1); the centre II, with a management of type 2, housed 1 horse (B2); the centre III, with a management of type 1, housed 1 horse (C1); the centre IV, with a management of type 2, housed 2 horses (D2 and E2); the centre V, with a management of type 3, housed 3 horses (F3, G3 and H3). Breeds of horses were: Anglo-Arab (n°1), Avelignese (n°3), Italian Selle (n°3), draught-horse crossbreed (n°1). They were 2 geldings and 6 females. Their ages ranged from 12 to 23 years. We observed a total of 64 patients affected by different pathologies: autism, motory handicap, blindness and deafness, children's cerebral paralysis, relational problems, mental deficiency, Down's syndrome.

The horses' behaviour was observed at rest and during therapeutic activities with these patients. The Heart Rate (HR) was used as physiological parameter for an ethological evaluation, measured by a telemetric heart rate monitor (Polar Horse Trainer®). Horses were analysed with a reactivity test for emotional homeostasis evaluation, too. Heart rate values were studied with non parametrical statistical analysis methods.

Distinct management typologies provided statistically different basal mean values of heart rate (intergroup and intragroup): Type 1 vs Type 2 ( $P \sim 0.05$ ) and Type 1 vs Type 3 ( $P < 0.05$ ). The comparison of heart rate during therapeutic activities of diverse management showed the following results: A1 vs B2 ( $P < 0.05$ ), B2 vs C1 ( $P < 0.05$ ), Type 1 vs Type 2 ( $P < 0.01$ ). Different managements, both in the same or different typologies, gave significantly diverse results (A1 vs E2:  $P \sim 0.05$ ; C1 vs E2:  $P \sim 0.05$ ; B2 vs E2:  $P \sim 0.05$ ).

This study shows that the statistic differences obtained by therapies with autistic patients derive from management conditions of Type 1. In reactivity test there aren't any significant differences among the three management typologies. However, we recorded strong variation between medium and maximum values of heart rate, especially in Type 1 and Type 2 of management.

These high variations of heart rate indicated fear reaction of the horse to new stimuli.

This reaction could lead to dangerous accidents for patients during therapeutic activities.

Horses used in therapeutic riding programs must be evaluated before this employment. Horse's behaviour can be assessed by an ethological observation and a reactivity test. Furthermore, the horses must be guaranteed welfare conditions and must live in an environment enriched with sensorial stimuli and respectful of their physiological and ethological needs.

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