Equine Assisted Psychotherapy with Suicidal Girls: Understanding the Changes over Time

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Abstract

The study investigated 17 suicidal girls attending Equine Assisted Psychotherapy (EAP) sessions as a complementary therapy. In particular, the study focused on three main issues. First, whether the patients’ happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination improved over time. Second, whether riders and novices benefited equally from the therapy. Lastly, whether and how horse responsiveness and patient’s motivation affected the outcome. Individual Growth Curves analysis was used to answer these questions. The results showed a significant improvement in awareness and coordination, and a small change in warm emotion and relaxation over time. Moreover, previous riding experience was related to higher scores in warm emotions, awareness, control, and coordination. However, this effect faded over time as the clients became more familiar with EAP. Finally, the patient’s attitude, reflected in the horse’s responses, influenced positively the overall outcome. In conclusion, beginners might need more time in order to feel comfortable with the EAP environment. Thus, it is crucial to set appropriate goals. Additionally, patient’s motivation is an important factor for the success of the therapy, as it will be reflected in the horse’s responsiveness, and will eventually lead to greater improvements. Overall, the results suggested that patients’ experiences with horse riding, horse responsiveness, and motivation are important elements of EAP that are related to improvements in suicidal girls over time.

*Keywords*: Suicide, suicidality, equine-assisted psychotherapy, EAP, suicidal girls.
Equine Assisted Psychotherapy with Suicidal Girls: Understanding the Changes over Time

Equine assisted Psychotherapy (EAP) is a form of counseling involving equines and addressed to individuals suffering from mental health issues, including suicidality. Suicidality refers to all suicide-related behaviors and thoughts, from suicidal ideation to attempted suicide and suicide (Bridge, Goldstein, & Brent, 2006). The suicide rate among youths (15-24 years old) has been dramatically increasing to the point that nowadays youths represent the group at highest risk in one third of the countries (WHO, n.d.). Regarding Sweden, in the year 2010, without accounting for attempted suicides, a total of 147 cases of suicide were documented among 15-25 year olds (109 males, 38 females) (NASP, n.d.). Although the rate of completed suicides is generally higher for males than females, suicide ideation and attempt rates are higher among females. Suicide ideation and previous attempts have been demonstrated important risk factors for subsequent suicide attempts (Bridge et al., 2006). Therefore, female youths are at risk and prevention efforts need to address this issue.

Theory and Risk Factors

According to the theories of cognitive vulnerability, including Abramson’s hopelessness theory (Abramson et al., 1998) and Beck’s cognitive theory of depression (Beck, 2002), negative cognitive styles constitute an important risk factor. These refer to the tendency to infer negative consequences and negative characteristics about one self, as one’s worthlessness, inadequacy, or failure, when negative life events occur. Additionally, negative cognitive styles are related to dysfunctional thinking about oneself (low self-esteem) and about the future (hopelessness), which in turn are salient risk factors for suicidality thoughts and, eventually, acts (Abramson et al., 1998). Furthermore, other crucial risk factors that have been found consistently related to youth suicidality are comorbidity, as a combination of disruptive, mood, and substance abuse disorders, substance use, availability of lethal means,
impulsivity/aggression, parental psychopathology, family history of suicide, parent-child relationship quality, and biological factors (Bridge et al., 2006).

Prevention/Intervention Efforts

Prevention efforts aim at those risk and protective factors that can be manipulated. When looking into biological and genetic risk factors, it is sadly clear that not all kinds of suicide can be prevented. On the other hand, reducing availability of lethal means, caring for individuals with mental illnesses and for individuals with records of previous suicide attempts are some of the measures that can be taken (WHO, n.d.). In particular, when dealing with youths who practice self-harm and attempted suicide before, the last possible step is indicated prevention. This is often in the shape of residential care. Here youths are provided, besides for the basic needs and daily care, with therapeutic services (Bates, English & Kouidou-Giles, 1997). Interventions targeting youths at risk for suicidality generally aim at improving coping skills, self-awareness, self-esteem, conflict-resolution skills, identification of conflicting thoughts, communication skills, and change in maladaptive behaviors. Usually, cognitive behavioral treatments are employed for this purpose (WHO, 2006). However, these youths need, beyond traditional treatment, tools and experiences that prepare them to be re-integrated in the society. Indeed, institutionalized forms of care carry the risk of stigmatization and social isolation. These not only occur before entering the treatment, rather they challenge the individuals throughout the rehabilitation process. For this reason, it is essential that institutionalized individuals experience different environments than the residential care facility along with stimulating, enjoyable activities that counteract the negative aspects of institutionalization (e.g. stigma, chance of self-injure, and escape) (Downs, 2012). These complementary activities are hypothesized helping to break out the negative thinking loop, promote resiliency, and reintroduce the will to seek pleasant activities and future goals. Therefore, numerous residential care programs include complementary
therapies in adjunct to conventional therapies. Examples of complementary therapies are, for instance, music therapy, outdoor activities, and animal-assisted therapy. These aim at enhancing, above all, youths’ social skills, self-esteem, and self-confidence (Bizub, Joy & Davidson, 2003; Burgon, 2011; Foley, 2009).

A form of Complementary Therapy: Animal Assisted Therapy

Animal-assisted therapy (AAT) can be defined as an intervention aimed at improving human emotional, physical, social, and /or cognitive functioning, where a certified animal plays a crucial part in the rehabilitation process. AAT is delivered or supervised by qualified health/human service professionals and the process is carefully documented and assessed (Pet Partners, 2012).

Equine-assisted therapy. In particular, Equine-assisted therapy (EAT) refers to the incorporation of equine activities or environment into the treatment. More in details, Equine-facilitated psychotherapy (EFP) refers to an experiential form of psychotherapy where a mental health professional, a suitable equine, and the client interact in order to achieve appropriate psychotherapy goals (PATH, 2012). Horses, unlike other animals, are social-prey animals, which makes them fine communicators, able to mirror the patient’s feelings and respond through body language (biofeedback) (PATH, 2012). These immediate, honest responses facilitate the development of a non-judgmental, non-threatening environment, where the patient can give up his/her masks and develop a true self-concept (Chandler, 2012). Here, verbal communication gives way to pure body language, thoughts, and feelings. Moreover, in order to control an 800-2,000 pound horse, it is necessary to practice a calm yet confident behavior, clear communication, and leadership, which implies training new important skills and eventually enhances self-esteem, self-awareness, and self-growth (Burgon, 2011; PATH, 2012).
Theory. Regarding the theory, Equine-assisted psychotherapy is based on principles from different theories, including Solution-focused, Cognitive-behavioral, Experiential, and Gestalt psychotherapy. Equine-facilitated psychotherapy can be seen as a natural and safe ground for practicing problem-solving. Situations that may occur in the presence of the horse often reflect the client’s life; that is, if something is not working with the horse it is probably not working in real life situations either (e.g. clear communication). This implies that the horse facilitates therapists’ observations and understanding of the client behavior, building client-therapist trust, client understanding of his/her issues, and an opportunity to practice new behaviors and experience consequent new feelings, in a safe environment. This is in accordance with the basic principles of the Solution-focused, Cognitive-behavioral, and Experiential models (Chandler, Portrie-Bethke, Barrio Minton, Fernando & O'Callaghan, 2010; Schultz, Remick-Barlow & Robbins, 2007). Moreover, the central use of body language is closely related to the Gestalt theory (Schultz, et al., 2007). In particular, the use of body language can give insights on body/language pattern incongruences and ultimately enhance self-awareness (Chandler et al., 2010).

Empirical research. Empirical research on EAT with suicidal youths is definitely scarce, almost absent, however a number of studies have worked with similar variables. Equine assisted counseling (EAC) has been found superior to less active counseling methods. In particular, at-risk children and adolescents in the EAC group showed significant improvements in coping, social stress, and self-esteem (Trotter, Chandler, Goodwin-Bond, & Casey, 2008). Similarly, positive results have been found for children referred to a psychotherapist for both behavioral and mental issues (Schultz et al., 2007). Among children, horse-assisted therapy has been found effective in reducing anger and improving physical coordination (Kaiser, Spence, Lavergne, & Vanden Bosch, 2004; Kaiser, Smith, Heleski & Spence, 2006). Moreover, positive trends were found for self-control, self-image, trust, and
general life satisfaction among residential-care adolescents; however, these only approached statistical significance. Nevertheless, adolescents participating in EAP sessions showed better adjustment at one-year follow-up (Bachi, Terkel & Teichman, 2011). Finally, in another comparative study evaluating the effectiveness of equine-assisted psychotherapy with adolescents at risk, both caregivers and youths reported reduced intrapersonal distress, including self-harm, hopelessness, depression, and anxiety, and improved interpersonal relations (Shultz, 2005). In conclusion, the few studies on the effectiveness of EAT with at risk youths show positive results as in the areas of self-esteem, coping, and interpersonal distress.

**Gaps in the literature.** Although this field of research is still at an early stage, empirical studies on horse-assisted therapy show positive results (see Selby, 2009). On the other hand, there is scarce empirical work on how this therapy works. That is, there are few studies taking under consideration different variables (e.g. previous experience with horses, number of sessions, and horse features) that might affect the effectiveness of this complementary therapy. In particular, to our knowledge, no previous studies have examined whether previous experience with horses or horses’ characteristics might influence the therapeutic outcome. On the other hand, a limited number of studies have shown that few sessions (5-8) of EAT with at risk youths can lead to significant results (Kaiser et al., 2004; Kaiser et al., 2006). Furthermore, one study found a significant correlation between the child’s improvement and the amount of therapy (Schultz et al., 2007). However, comparative studies on these issues are definitely scarce. Animal-assisted therapy and horse-assisted therapy in particular, are increasingly adopted as a bright form of alternative therapy. However, the basis for this therapeutic method, the how and why it works, are still to be fully explored. Hence, it is necessary to close the gap between the expanding practice and the actual knowledge of EAT theory and process (Bachi et al., 2011).
**Aim of the study.** The present study aims at investigating whether the girls attending EAP sessions show a significant change over time, and whether intervening variables (e.g. number of sessions, previous experience, horse and patient characteristics) affect this change.

Specifically, Individual Growth Curve analyses will be used in order to observe both individual and group change over time, taking into consideration the number of therapy sessions attended.

Additionally, the focus of the study will be on the previous riding experience of suicidal girls attending EAP sessions. Some girls are riders, while others come near horses for the first time. How is this going to affect the therapeutic path? Are beginner girls gaining more, since they learn new skills? Alternatively, are riders positively affected by a familiar and loved environment? On the other hand, is previous experience affecting the outcome at all? This will clarify whether EAP is recommended for certain individuals and not for others (i.e. individuals with/without previous experience) or it can be used without distinction. In order to answer this question we will compare two groups of girls: Riders and beginners, where beginners are defined as those approaching the horse-riding environment for the first time during the EAP sessions.

Finally, the horse-patient interaction will be brought into focus by investigating both horse and patient characteristics that might affect the therapy outcome. This will highlight which elements of the client-horse relationship detain a crucial role in the therapy. It is of extreme importance, in fact, to clarify the aspects of the client-horse interaction that practitioners need to emphasize during the practice.

**Method**

**Participants**

The sample of this study included 17 girls (13-22 years) in a residential care in East of Sweden. The girls were referred to the residential care, usually by a psychiatrist or social
care services, because of suicidal thoughts and self-harm, which indicate risk of suicide attempt. All the patients received both a cognitive-behavioral therapy and equine-assisted therapy as a complementary therapy. The patients participated in EAP during the time they receive cognitive-behavioral therapy. Thus, the number sessions participated for the current sample ranged between 7-16 over an average of 12 months. Moreover, a psychiatrist monitors each patient and is responsible for drug treatments when needed. Data were collected with the participants’ informed consent for institutional purposes, in order to monitor the residential care’s operation. Two of the girls who committed suicide were retained in the sample.

**Measures**

As part of the routine process, the therapist evaluated both the patients’ and the horses’ behavior during each EAP session. This constituted the record of each girl’s therapeutic path.

**Evaluation of Patients.** The therapist evaluated, on a Likert scale (1-10), the following patient’s characteristics: Motivation, active participation, willingness, happiness, warm emotion, awareness, relaxation, control, loquacity, and coordination. All these measures were composed of standard single-items included in the official evaluation forms that need to be filled out by the therapist after each session.

Happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination were identified as the patient outcomes of the EAP sessions. Patients’ motivation, participation, and willingness were identified as the predictors of the patient outcomes. The correlations between these three predictors over time were high, ranging from $r = .56$ to $.96$. Therefore, we coded the responses in the same direction, standardized the responses, and then, combined them by averaging three items. This composite variable was called “patient motivation.”
**Evaluations of Horses.** The therapist observes whether the horse showed openness and willingness to the client’s requests, whether he exhibited signs of stress or was calm, tense or relaxed and reported them on a Likert scale (1-10).

These horse-related measures constituted additional predictors for the client’s outcome. The correlations between these three predictors over time were high, ranging from \( r = .60 \) to .95. Therefore, after coding the responses in the same direction, standardizing, and combining them by averaging three items, we named the new composite variable “horse responsiveness”.

**Procedure**

The EAP sessions are planned around semesters and usually each semester entails about 7 sessions. After each session, the therapist filled in a protocol with the measurements previously described. EAP sessions can vary widely, depending on the client. In general, they can involve ground and/or mounted work, depending on the patient’s skills and mood. Ground work refers to grooming, saddling, longing, body awareness exercises, and so on. On the other hand, mounted work refers to riding both in the riding hall and out in the forest, with additional body awareness exercises and different tasks level according to the girl’s skills. In general, great emphasis was given to body relaxation and coordination, awareness and control. This is due to the need to gain a more complete image of oneself, where mental and body features function in a coherent manner (Chandler et al., 2010).

The therapists involved in the EAP sessions analyzed in the study have a combined education in Psychology, Socio-pedagogy, and horse-riding therapy along with basic riding instructor certification.

Participants were aware of the therapists’ observations and signed an informed consent form for governmental purposes. The horses were regularly checked by veterinaries for both governmental and research ethical requirements.
Analyses

As the sample for this study was small and characterized by heterogeneity in the number of repeated measurement, Individual Growth Curves analyses were chosen because of their flexibility. Individual growth curve models are highly flexible in modeling change in data where missing data exist, and the number of measurement occasions is not the same for all individuals (Francis et al., 1991). In the current sample, the patients had repeated observations ranging between 7 to 16, and they all started the EAT at different schedules. In fact, Individual Growth Curve analyses permit differential weighting of each subject’s data, so that the more precise the estimates (e.g. higher number of sessions) the higher the weight. Moreover, these analyses benefit from a high number of repeated observations (Francis et al., 1991), as in our case, one for each session (i.e. up to 16 observations). Finally, the Individual Growth Curve approach emphasizes the individual differences in change, which is the main purpose of this study. Thus, these models are very efficient in examining the predictors of variability in the change processes.

Results

The present study aimed at answering three main questions concerning suicidal girls attending EAP sessions. First whether there was a change over time in the girls’ happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination. Second, whether previous riding experience influenced these outcomes. Third, whether the horse’s behavior and the girl’s characteristics affected the outcome along the therapeutic path.

Changes in Patients’ Outcomes over Time

The first question to be answered concerned the changes over time in the patients’ outcomes variables (i.e. happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination) of suicidal girls attending EAP sessions. This change is displayed in Figure 1. In order to determine the change along the therapeutic path we adopted Individual Growth
analyses. As previously mentioned, these analyses take under consideration both individual- and group-level and the precision of each subject’s measures.

![Graph showing changes in patient outcomes over 16 EAT sessions.](image)

**Figure 1.** The change patterns in the patients outcomes over 16 EAT sessions.

As shown in Figure 1, there was a significant change over time for awareness (Est. = .13, \( p = .01, 95\% \text{ CI} [0.03, 0.22]\)) and coordination (Est. = .11, \( p = .04, 95\% \text{ CI} [0.01, 0.22]\)); a small change for warm emotion (Est. = .10, \( p = .07, 95\% \text{ CI} [-0.01, 0.20]\)) and relaxation (Est. = .13, \( p = .06, 95\% \text{ CI} [-0.01, 0.26]\)); and no change over time for happiness, control, and loquacity.

**The Effects of Previous Riding Experience**

The second question aimed at clarifying whether previous riding experience influenced the EAT outcome. To answer this question the variable identifying riding experience (1 = rider, 0 = beginner) was entered in the individual growth model as a covariate. This clarified whether the two groups benefited equally or not from EAT, with important consequences on the practice.

When the girls’ riding experience was taken to consideration, the model showed a change over time in warm emotions, where riding experience was related to warmer emotions.
Furthermore, the change in awareness remained significant and again experienced riders appeared slightly more aware than beginners (respectively, \( \text{Est.} = .13, p = .006, 95\% \text{ CI } [0.04, 0.22] \) and \( \text{Est.} = .74, p = .04, 95\% \text{ CI } [-0.2, 1.5] \)). However, as indicated by the confidence interval (the interval comprises zero), the effect was small. Moreover, riding experience had a significant effect on control (Est. = 1.3, \( p = .03, 95\% \text{ CI } [0.2, 2.4] \)); that is, riders were more likely to be in control during the EAP session as compared to beginners. Additionally, the change in coordination remained significant and riding experience was related to better coordination (respectively, \( \text{Est.} = .12, p = .03, 95\% \text{ CI } [0.01, 0.22] \) and \( \text{Est.} = .90, p = .02, 95\% \text{ CI } [0.2, 1.62] \)). On the other hand, there was no change and no significant effect of the girls’ riding experience on either happiness or loquacity. Moreover, there was a small change in relaxation but riding experience was unrelated to this outcome (respectively, \( \text{Est.} = .13, p = .06, 95\% \text{ CI } [-0.004, 0.26] \) and \( \text{Est.} = .26, p = .61, 95\% \text{ CI } [-0.79, 1.31] \)). Nevertheless, when the interaction term “Session*Experience” was entered, there was no significant effect of experience on the over time changes in the outcomes.

Therefore, previous riding experience had an effect on warm emotions, awareness, control, and coordination. This, however, was countered over time as the girls gained more practice.

**The effects of horse characteristics on changes during EAP**

Finally, the last question concerned the interaction between the client and horse’s measures. First, we entered the “horse responsiveness” as the only covariate in the Individual Growth model, in order to elucidate whether the horse’s behavior affected the client’s outcome. Afterwards, we entered both horse- and patient-related predictors (“patient motivation”) to clarify their combined effect on the outcomes. Lastly, the final model
included both horse- and patient-related predictors as covariates and determined their effect on the change over time.

When the horse characteristics (horse responsiveness) were entered in the model as the only covariate, they showed a significant effect on all the outcomes. Specifically, horse responsiveness had a significant effect on warm emotions (Est. = .47, p = .001, 95% CI [0.19, 0.75]); happiness (Est. = .61, p = .001, 95% CI [0.26, 0.96]); awareness (Est. = .49, p = .001, 95% CI [0.21, 0.76]); relaxation (Est. = .69, p < .001, 95% CI [0.31, 1.07]); control (Est. = .60, p < .001, 95% CI [0.31, 0.89]); loquacity (Est. = .40, p = .01, 95% CI [0.08, 0.72]); and coordination (Est. = .49, p = .002, 95% CI [0.18, 0.79]).

Thus, horse responsiveness had a significant effect on the patients’ overall outcome.

The effects of patient motivation on changes during EAP

When both horse and patient characteristics were entered in the model, the horse responsiveness is not significantly related to the girls’ outcome. That is, girls motivation had a significant effect on happiness (Est. = 1.50, p < .001, 95% CI [1.22, 1.77]); but not the horse responsiveness, whose effect resulted no more significant (Est. = .20, p = .17, 95% CI [-0.93, 0.5]). Furthermore, patient motivation had a significant effect on the girls’ warm emotions (Est. = 1.37, p < .001, 95% CI [1.2, 1.54]), while horse responsiveness was not significant (Est. = -.01, p = .95, 95% CI [-0.2, 0.2]). Similarly, the patient characteristics had a significant effect on awareness (Est. = 1.15, p < .001, 95% CI [0.95, 1.35]), while the horse-related characteristics were no longer significant (Est. = .12, p = .30, 95% CI [-0.11, 0.34]). Further, the patient characteristics had a significant effect on relaxation (Est. = 1.26, p < .001, 95% CI [0.96, 1.6]), but not the horse characteristics (Est. = .21, p = .25, 95% CI [-0.13, 0.54]). Likewise, the patient motivation was significantly related to control (Est. = 1.32, p < .001, 95% CI [1.12, 1.52]), while the horse responsiveness was not anymore (Est. = .11, p = .32, 95% CI [-0.11, 0.34]). Moreover, girls motivation had a significant effect on loquacity
(Est. = 1.22, \( p < .001 \), 95% CI [0.99, 1.46]), whereas the horse characteristics had no significant effect anymore (Est. = -.02, \( p = .88 \), 95% CI [-0.27, 0.23]). Finally, patient motivation was significantly related to coordination (Est. = 1.26, \( p < .001 \), 95% CI [1.03, 1.49]), while the horse predictor was non-significant (Est. = -.05, \( p = .66 \), 95% CI [-0.29, 0.19]).

Overall, patients’ motivation had a significant effect on each outcome and overcomes the horse-related predictor.

**What is more important in understanding the change?**

Table 1.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimate</th>
<th>SE</th>
<th>( t )</th>
<th>( p )</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>6.44</td>
<td>.29</td>
<td>22.32</td>
<td>&lt;.001</td>
<td>5.81</td>
<td>7.07</td>
</tr>
<tr>
<td>Session</td>
<td>-.01</td>
<td>.04</td>
<td>-34.74</td>
<td>.74</td>
<td>-.10</td>
<td>.08</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>.97</td>
<td>.31</td>
<td>3.16</td>
<td>.002</td>
<td>.36</td>
<td>1.58</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>.21</td>
<td>.24</td>
<td>.84</td>
<td>.40</td>
<td>-.28</td>
<td>.70</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>.08</td>
<td>.04</td>
<td>2.09</td>
<td>.04</td>
<td>.00</td>
<td>.16</td>
</tr>
<tr>
<td>Session*Horse Responsiveness</td>
<td>-.00</td>
<td>.04</td>
<td>-.03</td>
<td>.98</td>
<td>-.08</td>
<td>.08</td>
</tr>
</tbody>
</table>

As shown in Table 1, there was no significant change over time in the girls’ happiness. However, girls with a higher motivation were the ones who were more happy throughout the EAP sessions (Est. = .97, \( p = .002 \), 95% CI [0.36, 1.58]). Moreover, there was a slight effect of motivation on the girls’ change in happiness over time (Est. = .08, \( p = .04 \), 95% CI [0, 0.16]). That is, since the confidence interval comprises zero, the effect was a small effect. Horse responsiveness, on the other hand, had no significant effect on the girls’ happiness.
Table 2. Predictors of Changes in Patient’s Warm Emotions

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>6.31</td>
<td>.27</td>
<td>21.12</td>
<td>&lt;.001</td>
<td>5.74</td>
<td>6.89</td>
</tr>
<tr>
<td>Session</td>
<td>.06</td>
<td>.03</td>
<td>1.80</td>
<td>0.09</td>
<td>-.01</td>
<td>.13</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>1.33</td>
<td>.21</td>
<td>6.25</td>
<td>&lt;.001</td>
<td>.86</td>
<td>1.75</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>-.02</td>
<td>.18</td>
<td>-.12</td>
<td>.90</td>
<td>-.38</td>
<td>.34</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>.01</td>
<td>.03</td>
<td>.19</td>
<td>.85</td>
<td>-.04</td>
<td>.06</td>
</tr>
<tr>
<td>Session*Horse Responsiveness</td>
<td>.00</td>
<td>.03</td>
<td>.12</td>
<td>.91</td>
<td>-.05</td>
<td>.06</td>
</tr>
</tbody>
</table>

Similarly, there was no change over time in the patients’ warm emotions (Table 2). On the other hand, the patient motivation had a significant effect on the level of this outcome. Namely, the higher the motivation the warmer the emotions displayed during the sessions (Est. = 1.33, $p < .001$, 95% CI [0.86, 1.75]). Conversely, the horse related measures did not have a significant effect on the girls’ warm emotions.

Table 3. Predictors of Changes in Patient’s Awareness

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.88</td>
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<td>19.15</td>
<td>&lt;.001</td>
<td>5.23</td>
<td>6.54</td>
</tr>
<tr>
<td>Session</td>
<td>.11</td>
<td>.04</td>
<td>2.72</td>
<td>.02</td>
<td>.02</td>
<td>0.19</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>1.34</td>
<td>.25</td>
<td>5.29</td>
<td>&lt;.001</td>
<td>.84</td>
<td>1.83</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>.26</td>
<td>.21</td>
<td>1.21</td>
<td>.23</td>
<td>-.16</td>
<td>.68</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>-.02</td>
<td>.03</td>
<td>-.82</td>
<td>.41</td>
<td>-.09</td>
<td>.04</td>
</tr>
<tr>
<td>Session*Horse Responsiveness</td>
<td>-.03</td>
<td>.03</td>
<td>-.86</td>
<td>.39</td>
<td>-.09</td>
<td>.03</td>
</tr>
</tbody>
</table>

Furthermore, Table 3 showed that girls’ self-awareness significantly increased over time (Est. = .11, $p = .02$, 95% CI [0.02, 0.19]). Additionally, higher patients’ motivation corresponded to higher awareness (Est. = 1.34, $p < .001$, 95% CI [0.84, 1.83]). However,
there was no effect of horse responsiveness on the level of awareness. Similarly, neither the horse nor the patient predictors had an effect on the change in self-awareness over time.

Table 4. Predictors of Changes in Patient’s Relaxation

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95% CI Minimum</th>
<th>95% CI Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.61</td>
<td>.41</td>
<td>13.70</td>
<td>&lt;.001</td>
<td>4.76</td>
<td>6.47</td>
</tr>
<tr>
<td>Session</td>
<td>.07</td>
<td>.06</td>
<td>1.22</td>
<td>0.24</td>
<td>-.05</td>
<td>0.19</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>.90</td>
<td>.36</td>
<td>2.49</td>
<td>.01</td>
<td>-.22</td>
<td>1.62</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>.39</td>
<td>.30</td>
<td>1.28</td>
<td>.20</td>
<td>-.22</td>
<td>.99</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>.05</td>
<td>.05</td>
<td>1.06</td>
<td>.29</td>
<td>-.04</td>
<td>.14</td>
</tr>
<tr>
<td>Session*Horseresponsiveness</td>
<td>-.03</td>
<td>.05</td>
<td>-.62</td>
<td>.54</td>
<td>-.12</td>
<td>.06</td>
</tr>
</tbody>
</table>

Regarding patients’ relaxation (Table 4), the results displayed no change over time. Once again, however, when the girls’ motivation was higher relaxation was better as well (Est. = .90, p = .01, 95% CI [0.19, 1.62]). On the other hand, the horse responsiveness had no significant effect on the level of relaxation.

Table 5. Predictors of Changes in Patient’s Control

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95% CI Minimum</th>
<th>95% CI Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>6.99</td>
<td>.25</td>
<td>27.69</td>
<td>&lt;.001</td>
<td>6.47</td>
<td>7.50</td>
</tr>
<tr>
<td>Session</td>
<td>-.03</td>
<td>.03</td>
<td>-1.19</td>
<td>.34</td>
<td>-.09</td>
<td>.02</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>1.19</td>
<td>.24</td>
<td>4.91</td>
<td>&lt;.001</td>
<td>.71</td>
<td>1.67</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>.16</td>
<td>.20</td>
<td>0.79</td>
<td>.43</td>
<td>-.24</td>
<td>.56</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
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<td>.03</td>
<td>0.55</td>
<td>.58</td>
<td>-.04</td>
<td>.07</td>
</tr>
<tr>
<td>Session*Horseresponsiveness</td>
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<td>.03</td>
<td>-.12</td>
<td>.90</td>
<td>-.06</td>
<td>.06</td>
</tr>
</tbody>
</table>

Likewise, there was no change over time in the patients’ control (Table 5). However, motivation had again a significant effect on the level of control (Est. = 1.19, p < .001, 95% CI [0.71, 1.67]), but not horse responsiveness.
Table 6. Predictors of Changes in Patient’s Loquacity

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>6.35</td>
<td>.34</td>
<td>18.85</td>
<td>&lt;.001</td>
<td>5.63</td>
<td>7.06</td>
</tr>
<tr>
<td>Session</td>
<td>-.01</td>
<td>.05</td>
<td>-.19</td>
<td>.85</td>
<td>-.13</td>
<td>.11</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>1.44</td>
<td>.28</td>
<td>5.08</td>
<td>&lt;.001</td>
<td>.88</td>
<td>2.00</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>-.15</td>
<td>.23</td>
<td>-.63</td>
<td>.53</td>
<td>-.61</td>
<td>.31</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>-.03</td>
<td>.04</td>
<td>-.82</td>
<td>.41</td>
<td>-.10</td>
<td>.04</td>
</tr>
<tr>
<td>Session*Horse Responsiveness</td>
<td>.02</td>
<td>.04</td>
<td>.55</td>
<td>.58</td>
<td>-.05</td>
<td>.09</td>
</tr>
</tbody>
</table>

Further, no change over time was displayed for girls’ loquacity (Table 6).

Nevertheless, the higher the motivation the more talkative the girls were during the EAP sessions (Est. = 1.44, p < .001, 95% CI [0.88, 2.00]). Conversely, the horse responsiveness did not have a significant effect on loquacity.

Table 7. Predictors of Changes in Patient’s Coordination

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.65</td>
<td>.30</td>
<td>18.83</td>
<td>&lt;.001</td>
<td>5.01</td>
<td>6.28</td>
</tr>
<tr>
<td>Session</td>
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<td>.05</td>
<td>2.03</td>
<td>.06</td>
<td>.00</td>
<td>.20</td>
</tr>
<tr>
<td>Patient Motivation</td>
<td>1.26</td>
<td>.27</td>
<td>4.60</td>
<td>&lt;.001</td>
<td>.72</td>
<td>1.81</td>
</tr>
<tr>
<td>Horse Responsiveness</td>
<td>.11</td>
<td>.22</td>
<td>.50</td>
<td>.61</td>
<td>-.33</td>
<td>.55</td>
</tr>
<tr>
<td>Session*Patient Motivation</td>
<td>-.00</td>
<td>.03</td>
<td>-.01</td>
<td>.99</td>
<td>-.07</td>
<td>.07</td>
</tr>
<tr>
<td>Session*Horse Responsiveness</td>
<td>-.03</td>
<td>.03</td>
<td>-.88</td>
<td>.38</td>
<td>-.10</td>
<td>.04</td>
</tr>
</tbody>
</table>

Finally, Table 7 showed a small change over time for coordination (Est. = .10, p = .06, 95% CI [0, 0.20]). Moreover, once again the girls’ motivation had a significant effect on the patients’ coordination (Est. = 1.26, p < .001, 95% CI [0.72, 1.81]), while horse responsiveness did not.
To summarize, the final model showed a significant change over time in the girls’ awareness and a small change for coordination, but not in the other outcomes. Furthermore, patients’ motivation had a significant effect on each outcome level. Namely, the higher the motivation the higher the patients’ scores on happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination. On the other hand, the horse-related characteristics did not have any significant effect on the outcomes. Finally, patients’ motivation had a small effect on only one change over time; i.e. the change in patients’ happiness.

Discussion

The present study was meant to investigate the therapeutic path of suicidal girls attending EAP sessions and extend the research related to EAP theory and practice. Specifically, the study aimed at answering the three following questions: Whether the patients improved over time (happiness, warm emotions, awareness, relaxation, control, loquacity, and coordination), whether previous riding experience influenced this outcome, and what role horse- and patient-related characteristics played in the therapeutic outcome.

The first answer the study provided is that, over time, the girls’ body- and self-awareness and coordination increased considerably, while a small change appeared for warm emotions and relaxation too. This, regardless the number of sessions attended. Improvement in mind and body awareness was one of the main focus of the therapy, as among suicidal patients these two components often coexist in an inharmonious way. Moreover, dissociation from one’s mind or body, and lack of emotional expressivity as well, are highly correlated to self-harming behavior (see Fliege, Lee, Grimm & Klapp, 2008). Improvements in warm emotion and awareness support the theories behind EAT (in particular Experiential and Gestalt theory). According to these theories, in fact, the horse’s instinctive responses allow the disclosure of the patient’s true feelings and emotions and require an honest body
language. Consequently, awareness of one’s inner self arises from the horse mirroring function, while body-awareness and expression of one’s emotions is necessary in order to create a good communication with the horse. Furthermore, concerning the body-mind connection, the EAP session entails work on coordination, including balance and motor skills, and body relaxation. Coordination is an important skill practiced during horse riding and has been found an EAP outcome before (Kaiser et al., 2006). Body stiffness is often a consequence of psychological anxiety transferred into the muscles. Relaxation is learnt again through the feedbacks the horse provides; that is, when the body relaxes, the horse will manifestly relax too (for instance, stretching his neck or snorting). By focusing on another living being, it is therefore possible to deal with body and mental issues in a different way.

Made this experience possible, the next step is to reproduce it outside the stable environment. On the other hand, no change over time appeared for happiness, control, and loquacity. By looking at the therapist’s ratings, what clearly emerged was the instability that characterizes these patients. Besides the two suicidal cases and more severe cases (i.e. schizophrenia) included in the sample, all the girls have been indicated by social services or a psychiatrist due to a certain acuteness. Moreover, happiness, as explained by the therapist (E. Strid Ege, personal communication, October 8, 2011), is not always a reliable feature to observe. Sometimes, in fact, the happiness shown by the girl is the prelude to a crisis and as such, often leaves the therapist with an uncomfortable feeling. These results, therefore, are not surprising, as depression (versus happiness and talkativeness) and impulsivity are two main factors for youth suicidality (Bridge et al., 2006) and it is not always possible to intervene successfully when rooted in personality and genetics.

Regarding the second question of this research, previous riding experience had an influence on a number of outcomes. In particular, riders appeared to show more warm emotions, to be more in control and less impulsive, and more coordinated. Better control and
coordination might not be a surprise, as the practice helps both these skills. On the other hand, warmer emotions could be a consequence of the familiarity riders have with the environment. Additionally, riders seemed to have slightly better awareness. However, the results also suggest that these differences disappeared over time, as all the patients gained more knowledge and practice within the horse-riding environment. This finding indicates that the patient who has no previous experience with horses whatsoever benefits equally well from the therapy as if he was an expert rider. Naturally, the therapeutic goals set with the client play a crucial role in this context. That is, previous riding experience does not preclude an optimal EAP outcome as long as the goals agreed with the patient are appropriate.

Finally, concerning the last question, the results of this study showed that the horse behavior has an impact on the EAP process. Specifically, horse characteristics had an effect on all the outcome measures. When accounting for the patient’s motivation to get involved in the session, however, this predictor overcame the horse characteristics. Rather than meaning that the horse behavior is not an important element in the therapy, this finding suggests that the horse actually mirrors the client’s internal state. Therefore, in line with the biofeedback principle, the horse pray-nature is to observe and reflect the behavior of the other living beings surrounding (PATH, 2012). Hence, the horse behavior is highly informative, for both patient and therapist, regarding the patient’s emotions and conflicts. Furthermore, the final model took under consideration the interaction terms of time (session) and horse/patient characteristics. This model displayed a significant change over time in the girls’ awareness and a small change for coordination. However, no other change over time resulted significant. As previously mentioned, looking at the therapist’s evaluations this result is not surprising. That is, the variance for each girl was extremely high along the therapy period. On the other hand, the patients’ motivation had a significant effect on every single outcome level. That is, the higher the motivation the better the overall outcome. Conversely, the horse-related
characteristics were not significant predictors in the final model. Yet, as aforementioned, this suggests that horse and patient characteristics work in the same direction. Finally, regarding the interaction over time, patients’ motivation had an effect on the small change in happiness only. Therefore, the variables related to the change found in awareness and coordination still need to be elucidated.

In summary, there was a significant change over time in the girls’ self- and body-awareness, which was not explained by either horse or patient characteristics. It is possible to hypothesize that the experience outside the institutionalized care system helps the patients experience themselves as other than psychiatric patients. Moreover, horse riding gives way to the person’s unexplored skills and interests (Bizub et al., 2003) and an opportunity to explore oneself (PATH, 2012). On the other hand, being aware of one’s own physical being and body language, as well as to the horse and the surrounding environment, is a security matter (Schultz, 2007). Nevertheless, the body becomes a crucial and powerful tool to communicate effectively with the horse in order to complete an exercise (PATH, 2012). Similarly, the small change in coordination was not related to the predictors. However, coordination has been found an EAT outcome before and can be defined as one of the bases for therapeutic horse riding in physiotherapy (Håkanson, 2008). Therefore, the improvement in coordination can be seen as a natural result of the physical stimuli that horse riding provides. Yet, no other outcome changed consistently from the first to the last session. EAP with suicidal girls, thus characterized by an extremely unstable mood, seems therefore unlikely to yield a linear change over time. Nevertheless, as shown in Figure 1, improvements in this particular population are possible. Therefore, provided the due attention to each patient’s illness progress and consequently set appropriate treatment goals for each patient (Bachi et al., 2011), EAP can be successfully adopted in the context of indicated prevention. Furthermore, regardless of the level of experience, the patient’s motivation and willingness, reflected in the
horse’s response, appeared to be a crucial element for the success of EAP. This finding illustrates that previous experience around horses is neither necessary nor constraining for the success of the therapy. Few differences might exist at the beginning, favoring the patients who are already familiar around horses. However, over time, the two groups benefit from EAP in a similar fashion. Regarding the patient’s motivation, practitioners clearly need to boost and support the patient’s willingness to participate, learn, and understand the horse during the EAP session. Here again the importance of setting clear and suitable goals is emphasized. These should be discussed with the patients and be realistic and achievable. For instance, riding the “best” horse in the stable can be achieved, in safety, first just sitting on his back. Next step will be walking or trotting, and so on. This stimulates not only the patient’s motivation to practice and improve, but also the awareness in one’s skills and, as a consequence, in self-esteem.

Although the results move towards a positive direction and show an overall improvement, two completed suicides occurred in the sample. Postmortem analyses indicated brain malfunctioning. Surprisingly, studies on the biological contributors to suicide have not fully clarified this issue yet. However, we do know that although mental disorders definitely contribute to suicide, they, alone, do not explain it. Twin studies have demonstrated a clear genetic connection to suicide (Joiner, Brown & Wingate, 2005; Mann & Currier, 2010). Moreover, the ventral prefrontal cortex has been found having an important role in suicide. This knowledge derives, first, from several postmortem studies of suicide victims’ brains, which show abnormalities in the serotonergic system of this area, independently of the presence of depression. Additionally, we know that the ventral prefrontal cortex is engaged in the behavioral and cognitive inhibition. That is, damages and malfunctions in this area can lead to disinhibited behavior and consequently facilitate the suicidal act (Mann & Currier, 2010). This might explain the results of the study. Although an overall improvement was
observed, a deeper drive was fatally there. The hypothesis that suicide happens independently from the psychiatric illness itself is supported by the fact that most psychiatric patients do not attempt suicide (Mann, 2003). As previously mentioned, not all kinds of suicide can be prevented.

Naturally, this study encompasses some limitations. First of all, the sample was narrow. This implies that the results might not be as sound as with a broader sample. Nevertheless, the high precision of the measurements, namely the number of repeated measures, might counteract for this limitation. Yet, future research should replicate this study with a wider population and possibly include male subjects as well. In fact, as mentioned before, suicide is an important issue for both girls and boys. Moreover, an important question to investigate in the future is whether male and female subjects benefit from EAP in the same way. Great part of the literature claims Equine assisted Therapy to be not gender-specific (Selby, 2009). On the other hand, a common popular belief is that a natural affiliation between female individuals and horses exists. It would therefore be interesting to verify empirically this idea in order to reach sound knowledge on this aspect of the human-horse relationship. However, this objective was beyond the scope of this study, which specifically focuses on suicidal girls. Suicidal male and female subjects, in fact, differ quite drastically. It might therefore be beneficial to focus on each one of them separately. Furthermore, future studies should entail a controlled randomized design. That is, they should include a control group receiving the treatment as usual (TAU) only to compare with those receiving both TAU and EAP and, possibly, a third group receiving TAU along with another form of complementary therapy (e.g. music therapy, dance therapy, outdoor activities, and so on). With the obvious attention to ethics, this would allow sound causal inferences on the effectiveness of EAP. Finally, all the measures derived from the therapist’s direct observation. Therefore, due to the therapist’s direct involvement, they might have been
biased and tend towards a more positive trend (observer-expectancy bias) (Bryman, 2008). Additionally, the measures were not direct measures of the patients’ suicidality (e.g. self-harm, self-esteem, depression, and hopelessness) rather they were correlates. Although the outcomes considered in the study are highly informative, including direct measures of suicidality would most likely refine the results of the study.

On the other hand, the present study holds a number of strengths too. To begin with, the measurements involved were quite exceptional. That is, the girls have been monitored with a certain precision (after every session). This allows a clear picture of the girls’ growth along the EAP path. In fact, Individual Growth analyses benefit from a large number of measurements (Francis et al., 1991). Furthermore, the measures did not only concern the girls but the horses as well. Thus making possible the observation of horse-client interaction characteristics, that would otherwise be overlooked. Finally, although the absence of a RCT design, the study allows to focus on between-subjects and horse-related characteristics that might affect the EAP effectiveness. Therefore, it contributes to clarify practice and theory issues of extreme importance in order to build a sound complementary therapy.

In conclusion, EAP with suicidal girls, either novice or expert riders, has proven to be a suitable complementary therapy. Although the improvement was not consistent over time, rather characterized by highs and lows, the benefit is still clear and discloses the power of this therapy. In particular, the study showed that the patient’s motivation enhanced this change, and therefore represented a crucial ingredient for EAP practice. In turn, the horse responded to the patient’s behavior and mirrored his/her internal state, as described by the biofeedback hypothesis (PATH, 2012). The horse ability to provide important insights to both therapist and patient confirms the EAP’s great therapeutic potential. Further, the interaction between patient and horse appeared to be a key element of EAP and as such needs to be emphasized in the practice.
References


