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The Impact of Therapeutic Riding for People with Disabilities on Variables Related to Mental Health

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ABSTRACT Substantial anecdotal evidence and some research indicate that therapeutic riding for people with disabilities has a positive impact on mental health. There is similar evidence showing that equine programs that include a psychotherapeutic component also have a positive impact. However, much of the existing research has many methodological problems, the most common being the absence of a comparison or control group. Therefore the present study investigated the mental health benefits of therapeutic riding for people with disabilities in comparison to therapeutic skiing for people with disabilities. The age range of participants was 16 to 70 years. They had a wide range of physical disabilities. In a quasi-experimental pre-test post-test design, all participants completed The Beck Depression Inventory, The Beck Anxiety Inventory, and The Rosenberg Self-Esteem Scale. They also completed an adjective checklist, consisting of 26 items that focused on mood, emotion, and sense of self. Open-ended interviews were conducted with a subset of riders. In addition, the riders completed the Pet Attitude Scale (PAS-M). Scores on the PAS-M were not related to the three psychometric measures. Both groups improved on the three psychometric measures during the course of their respective programs. Although the improvement was statistically significant, it was not clinically significant. Contrary to the hypothesis, there was no difference in improvement between riders and skiers on these measures. However, on the adjective checklist riders felt more positive regarding 21 of the 26 items, and of those 21, eight were statistically significant. The interview data suggest that the riding program improves motivation, relationship building, and self-esteem. Although these results must be interpreted with caution, due to the exploratory nature of the checklist and the interviews, they suggest that equine activities have a positive impact for people with disabilities and may have a greater impact than other activities for some aspects of mental health. However, the positive impact may be related to general wellbeing rather than psychopathology *per se*.

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Horseback riding has been used as a form of physiotherapy for people with disabilities for decades. During this time anecdotal evidence indicated that it also had beneficial psychological effects. As a result the field of therapeutic riding has expanded to include riders with a wide variety of psychological difficulties and to include riding programs with explicit psychotherapeutic components. As a result, systematic research on the psychological impact of therapeutic riding programs has emerged. However, this research contains a variety of methodological problems and, with a few exceptions, most lack control or comparison groups (Anestis et al. 2014). Therefore, the purpose of the present study was to compare the mental health benefits of therapeutic riding for adolescents and adults with disabilities with a comparable activity that does not involve animals, specifically downhill skiing for people with disabilities. We deliberately chose to compare two programs without a psychotherapeutic component in order to best isolate the impact of the presence of horses. Because of what is known about contact with animals and mental health (Friedmann 2000; Hart 2000; Serpell 2000; Walsh 2009), we hypothesized that riding would have a greater impact on mental health because it involves working with horses.

Health Benefits of Contact with Animals

Companion animals can have a positive impact on both physical and mental health. Pet ownership is associated with decreased illness, fewer contacts with physicians, and a general decrease in utilization of health care services (Siegel 1990; Serpell 1991). The presence of an animal is correlated with a reduction in stress and stress-related illnesses (Friedmann et al. 1980; Friedmann 2000), as well as reductions in blood pressure and cholesterol and triglyceride levels, in comparison with non-pet owners (Katcher et al.1983; Anderson, Reid and Jennings 1992; Beck and Katcher 1996; Odendaal 2000; Barker et al. 2005). These studies include both anecdotal evidence as well as data from quasi-experimental designs. In a different vein, Headey and Grabka (2007) report that pet owners spend millions of dollars less on medical care in comparison with non-pet owners, which they interpreted to be an indicator that pets contribute to health.

The presence of animals can also have positive psychological effects. It can reduce depression (Odendaal 2000; Serpell 2000: Melson 2001; Benson 2002; Johnson 2004; Antonioli and Reveley 2005) as well as anxiety (Katcher, Segal and Beck 1984; Cole and Gawlinski 1995; Hansen et al. 1999; Brubaker et al. 2004). The presence of animals has improved functioning in psychiatric patients (Corson et al. 1977; Barker and Dawson 1999; Marr et al. 2000; Barker, Pandurangi and Best 2003; Barker, Rasmussen and Best 2003), and can provide a motivating factor for treatment (Barker and Dawson, 1999; Barker, Pandurangi and Best 2003a; Barker, Rasmussen and Best 2003). In summary, the presence of animals, primarily dogs and cats but other small companion animals as well, can have a positive influence on psychological wellbeing.

Therapeutic Riding and Mental Health

Because of the evidence of the beneficial effects of the presence of animals, combined with observations of the psychological benefits of horse riding for people with disabilities, several types of riding activities have been developed to address mental health issues for a variety of populations. Therapeutic riding, also referred to as equine-related treatment (ERT), is an umbrella term for these activities. It includes therapeutic horseback riding (THR) and equine-

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assisted psychotherapy (EAP). THR focuses on teaching the client horsemanship including riding, grooming, and feeding the horse. The ultimate goal may be to enhance motor abilities and strength as in programs of riding for people with disabilities, or may be to develop social skills or psychological strengths such as better communication and cooperation. In contrast, EAP does not involve riding. It uses a series of exercises in which the client or a group of clients interact with horses to accomplish a task (Anestis et al. 2014) such as leading the horse across a paddock without touching the animal and then talking about the experience. In EAP there are many exercises, ranging from the simple to complex, and the way in which the exercises are deconstructed with the clients may depend on the practitioner's theoretical orientation. Thus, ERT as practiced in one research study might look quite different in another. Other equine-related programs include equine-assisted counseling (EAC) (Trotter at al. 2008) and equine-facilitated learning (Ewing et al. 2007). Both involve exercises on the ground as well as in the saddle. The commonality among all these programs is the hypothesis that the presence of the horse is a significant contributor to improvements in the psychological wellbeing of the client.

For that reason the field has expanded to include a diverse group of clients and has investigated a wide range of psychological benefits. These include: increased self-efficacy (Farias-Tomaszewski, Jenkins and Keller 2001), general wellbeing (Klontz et al. 2007), self-esteem (Krawetz and DePrekel 1993), self-discipline, increased sense of control, and a growing sense of normality (All, Loving and Crane 1999). Moreover, ERT seems to have a positive effect on attention span, spatial awareness, concentration, listening skills, interest in learning, willingness to take risks, and verbal skills (Mayberry 1978; Dismuke 1984; Krawetz and DePrekel 1993).

The participants in these studies are also diverse, including those with developmental delay, psychiatric difficulties, and the after-effects of trauma. For example, therapeutic riding increased confidence, self-concept, and self-efficacy in adults with longstanding psychiatric illnesses (Bizub, Joy and Davidson 2003). It facilitated the development of friendships and gaining social acceptance in a study of adolescent girls with emotional difficulties (Krawetz and DePrekel 1993) and for children with cerebral palsy in another study (MacKinnon et al. 1995). Other research has focused on psychiatric patients (Corring, Lundberg and Rudnick 2013), grieving children (Glazer, Clark and Stein 2004), students at high risk for academic and social failure (Trotter et al. 2008), children with attention deficit hyperactivity disorder (Cuypers, DeRidder and Strandheim 2011), children with autism (Bass, Duckowny and Llabre 2009; Kern et al. 2011; Gabriels et al. 2012; Ward et al. 2013; Jenkins and DiGennaro Reed 2013; García-Gómez et al. 2014), and other children with severe emotional disorders (Ewing et al. 2007).

The measures used to evaluate riding programs are similarly wide ranging. They include quality of life (Zabriskie, Lundburg and Groff 2005; Davis et al. 2009; García-Gómez, et al. 2014), social functioning (Bass, Duchowny and Llabre 2009), communication and sensory processing (Ward et al. 2013) hyperactivity, irritability, expressive language skills (Gabriels et al. 2012), externalizing, internalizing, maladaptive, and adaptive behaviors (Trotter et al. 2008), affect, compliance, and off-task behavior (Jenkins and DiGennaro Reed 2013), depression, aggression, self-esteem, and locus of control (MacDonald 2004 cited in Trotter et al. 2008) to name a few.

With such a range of populations, programs, and measures, it is not surprising that the results of research on the influences of therapeutic riding are mixed. For example, Smith-Osborne and Selby (2010) identified 15 research studies published between 1983 and 2008 that evaluated equine-assisted activities and summarized the results. Of those, seven showed no effect

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of ERT on psychosocial measures. In another study investigating quality of life, only one of 10 subscales was significantly affected by riding activities (Davis et al. 2009). Ewing et al. (2007) found no significant effect on four measures of psychosocial functioning in children with severe emotional disorders. Yet the anecdotal evidence provided in case descriptions of the participants showed striking positive effects. Other studies found positive effects, such as Holm et al.'s (2014) case studies of three children with ASD, although the low number of participants limits the generalizability. Lastly, Zabriskie, Lundberg and Groff (2005) investigated the impact of therapeutic riding and therapeutic skiing on quality of life. Because there were no pre-test differences between the two groups on any of the five quality-of-life (QOL) items, the two groups were combined. A majority of participants endorsed the five items in the post-test measure of quality of life, and there were no differences between the two groups. However, the measure of QOL had no demonstrable psychometric properties.

The research in this area of inquiry seems to be driven primarily by a need for program evaluation, with the variables in each study reflecting the individual goals of each program. This has resulted in research on a wide variety of populations with a wide variety of outcome measures and little cohesion.

As Anestis et al. (2014) point out, many of these studies have more than their share of methodological difficulties, the lack of a control or comparison group being the most critical issue. In fact, we found only five that included a control or comparison group (Zabriskie, Lundberg and Groff 2005; Trotter et al. 2008; Bass, Duchowny and Llabre 2009; Kern et al. 2011; Gabriels et al. 2012). Of these, in three studies the control group consisted of a wait list (Zabriskie, Lundberg and Groff 2005; Bass, Duchowny and Llabre 2009; Gabriels et al. 2012). The present study was designed to address this particular difficulty. The mental health benefits of therapeutic riding for people with disabilities were compared with the benefits of therapeutic downhill skiing for people with disabilities. Because of the extensive research on the positive impact of animals on mental health, we hypothesized that there would be a greater improvement for riders than for skiers.

Methods

Participants

Determining an appropriate control or comparison group was a challenge. Unlike a drug trial for example, in which the placebo and drug look the same and are administered using exactly the same procedure, removing the horse changes many things about the setting and the context of the activity, and a blind study is out of the question. As another example, in comparisons of two different types of psychotherapy, the process of psychotherapy may be different, yet the activity of talking takes place under similar conditions. Our task was to find a sport that had components comparable to horse riding. Of all the sports we considered as comparisons (including sailing and basketball), skiing had the most in common with riding. It is an individual sport that is done in a group with opportunities for the participants to socialize, and it is an outdoor activity arguably with some potential connection to nature.

The length of each program was not consistent and ranged from 8 to 12 weeks. The focus of both the skiing program and the riding program was to develop skills related to the activity. Each skier was accompanied by an able-bodied partner. Riding lessons took place in groups led by one coach. Depending on the level of skill, riders might be accompanied by side-walkers on either side of the horse, and another person leading the horse. This was for safety. Thus, there were a number of variables that were not controlled for, but there were no systematic

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differences between the skiers and riders. Neither program incorporated a psychotherapeutic component or addressed mental health specifically.

Twenty-one riders (4 males and 17 females) and 14 skiers (4 males and 10 females) participated in this study, for a total of 35 participants (8 males and 27 females). Their ages ranged from 16 to 70 years (M = 31.2, SD = 14.3). The mean age for riders was 31.2 (SD = 15.4); the mean for skiers was 31.3 (SD = 12.9). Fourteen percent of the riders (n = 3) were new to horseback riding, while the remainder had participated in at least one 8 or 12-week session previously. The low number of new riders meant that it was not possible to compare new and returning riders. All riders had a physical disability including traumatic brain injury, scoliosis, left-side paralysis due to stroke, and visual impairment. In addition, four riders had a developmental disability including Down syndrome and autism spectrum disorder. Fifty-two percent (n = 11) were referred to the program by a physician or physiotherapist.

Twenty-one percent (n = 3) of the skiers were new to skiing, while the remainder had skied at least one season. All skiers had a physical disability including amputation, partial paralysis, or cerebral palsy. Forty-three percent (n = 6) were referred to the program by a physician or physiotherapist.

Procedure

Data collection began after receiving approval from the Social Sciences, Humanities and Education Research Ethics Board at the University of Toronto, Canada. Packages of questionnaires were distributed to participants in therapeutic riding and therapeutic skiing programs prior to the start of the program. The packages contained three psychometric measures, an adjective checklist, and a questionnaire asking for demographic information. The riders' package also included a measure of attitudes toward companion animals. All participants completed a post-test package at the end of the program. Both packages included a detailed information page indicating that completing the survey and returning it constituted consent to participate in the study.

Eighty-seven packages of questionnaires were distributed to riders at three therapeutic riding facilities in Ontario, Canada. Staff distributed the packages to riders (or, when appropriate, to their parents) at the beginning of their therapeutic riding program. Twenty-one packages were completed and returned. Everyone who completed a package also completed another set of questionnaires at the end of the program. The response rate was 24%.

Sixty-nine packages of questionnaires were distributed to skiers at two therapeutic skiing associations in Ontario, Canada. The response rate was 20%.

Measures

The packages of questionnaires included the following measures. They were chosen in order to represent a range of mental health issues that had been included in previous research. These were completed before the respective programs began, and at the end of the programs.

Rosenberg Self-Esteem Scale (RSES) (Rosenberg 1965): The RSES is one of the most widely used measures of self-esteem (Alessandri et al. 2015). It consists of 10 items using a Likert-style scale. It has excellent internal consistency and test-retest reliability (Blascovich and Tomaka 1993), and excellent concurrent, predictive, and construct validity (Hagborg 1993; Overholser et al. 1995; Pastore, Fisher and Friedman 1996; Griffiths et al. 1999). Satisfactory reliability and validity have been established in a wide variety of populations and age groups (Blascovich and Tomaka 1993; Rizwan, Shah and Dharwarwala 2012; McMullan and Resnick

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2013; Conti, Adams and Kisler 2014; Galanou et al. 2014; Alessandri et al. 2015). Scores range from 4 to 40.

Beck Anxiety Inventory (BAI): The Beck Anxiety Inventory (BAI) is a brief, self-report scale that measures symptoms of anxiety that are minimally shared with those of depression (Beck and Steer 1990). The scale consists of 21 items, each describing a common symptom of anxiety. The respondent is asked to rate, on a 4-point scale ranging from 0 to 3, how much he or she has been bothered by each symptom over the past week. The scores are categorized in this way: Severe, 26 to 63; Moderate, 16 to 25; Mild, 8 to 15; Minimal, 0 to 7. The measure is short and easy to understand (Jolly et al. 1993). It has high internal consistency, reliability, and validity (Fydrich, Dowdall and Chambless 1992; Jolly, et al. 1993; Creamer, Foran and Bel 1995). For example, Jolly et al. (1993) found high internal consistency (alpha = 0.94), acceptable item-total score correlations ($M = 0.66$), and moderate to high concurrent validity; that is, the BAI correlated significantly with clinician ratings ($r = 0.40$) and self-report ($r = 0.58$) measures of anxiety. Test-retest reliability data from Beck, Steer and Garbin (1988) showed a coefficient of 0.75 over one week.

Beck Depression Inventory (BDI- II) (Beck and Steer 1990): The BDI-II is a 21-question multiple choice survey that is one of the most widely used instruments for measuring the severity of depression. The questionnaire is composed of items describing symptoms of depression. Participants are asked to rate how they have been feeling for the past two weeks. The scores are categorized in this way: Severe, 29 to 63; Moderate, 20 to 28; Mild, 14 to 19; Minimal, 0 to 13. Internal consistency, validity, and reliability are all consistently good (Ambrosini et al. 1991; Beck, Brown and Steer 1996; Richter et al. 1998). It has good concurrent validity. It is positively related to the Scale for Suicide Ideation ($r = 0.37$, $n = 158$) as well as the Beck Hopelessness Scale ($r = 0.68$, $n = 158$). The BDI-II is also positively correlated with the Hamilton Psychiatric Rating Scale for Depression ($r = 0.71$, $n = 87$) and the Hamilton Rating Scale for Anxiety ($r = 0.47$, $n = 87$; Beck et al. 1996). A diagnostic efficiency study using a clinical college sample of 127 students yielded a 93% true positive rate and 18% false positive rate (Beck et al. 1996).

Pet Attitude Scale-Modified (PAS-M): This is a measure assessing the level of positive or negative attitudes toward companion animals (Templer et al. 1981; Munsell et al. 2004). Responses to the 18 items are on a 7-point scale, ranging from "strongly disagree" to "strongly agree." Questions are phrased so that they can be answered regardless of whether or not the respondent actually has a pet. Possible scores can range from 18 to 126; the higher the score, the more positive the person's feelings are toward pets. Seventy-two is a neutral score. This measure was chosen from among a number of scales because of its psychometric properties, face validity, and brevity. Templer et al. (1981) reported a test-retest reliability of 0.92 ($p < 0.001$). It is one of the few scales in this area with data on reliability (Anderson 2007) and has been utilized in nearly 30 published studies (Anderson 2007). The measure has been shown to distinguish between people who work with animals and a more general population (Netting, Wilson and Fruge 1988).

Adjective Checklist: We created a checklist consisting of 26 descriptors related to mood, emotion, and sense of self. The items were compiled from a list of variables that had been examined in previous research (Table 2). The checklist was included in the second questionnaire package. Respondents were asked to indicate the adjectives which they felt had changed in a positive direction since the beginning of their current riding/skiing experience. There are no reliability or validity data for the checklist, but it arguably has face validity.

We also collected demographic information.

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Open-ended Interviews

For both skiers and riders, the second questionnaire asked permission to contact the participant for the purpose of conducting an interview. Seventeen riders but only three skiers agreed to be interviewed. We conducted these interviews but did not consider the number of skiers to be sufficiently representative for a comparison between the two groups. However, some of the comments from riders suggest avenues for future research, and these will be mentioned in the results.

Participants were provided with a detailed information letter. At the beginning of the interview they were asked to indicate that they had read the letter and consented to participate. Their consent was audio-recorded and transcribed.

Interviews were conducted with participants in the therapeutic riding group and their parents, in order to get a better understanding of the ways in which the therapeutic program was beneficial. Using the constant comparative method of data analysis (Maykut and Morehouse 1994), several themes were derived from the interview data. These themes represent the differences the participant noticed in themselves (or the changes the parent noticed in their child) that they directly attributed to involvement in the therapeutic program.

Results

Participants in the therapeutic riding group completed the PAS-M and the scores ranged from 41 to 120, with a mean of 88.5 (SD = 21.60). Using the score of 72 as a cut-off, the sample was split into two groups, individuals with more negative views toward animals and individuals with more positive attitudes toward animals. PAS-M scores were not related to changes in self-esteem, anxiety, or depression or the scores on the adjective checklist.

There were no differences between the riders and skiers on the pre-test scores on the RSES, BAI, and BDI-II, and all scores were in the normal, non-clinical range. Changes in scores for the RSES, BAI, and BDI-II from pre-test to post-test were analyzed separately, with the program as the independent variable. Scores for all pre- and post- measures are shown in Table 1. An ANOVA indicated a statistically significant rise in self-esteem for both groups between pre- and post-tests ($F_{(1,33)} = 48.43$, $p < 0.05$). No interaction effect was found, meaning that both groups experienced the same amount of improvement. An additional analysis confirmed that the post-test self-esteem scores were not significantly different between the two groups ($F_{(1,33)} = 0.55$, $p = 0.46$).

Results for the BAI followed a similar pattern. Both groups had significantly lower scores at the end of their program (indicating less anxiety) ($F_{(1,33)} = 37.52$, $p < 0.005$). Again, there was no difference between the two groups in the amount of change. An additional analysis confirmed that the post-anxiety scores for skiers and riders were not significantly different ($F_{(1,33)} = 0.012$, $p = 0.91$).

Table 1. Mean scores for the pre- and post-test psychometric measures.

	Pre-test		Post-test			
Scale	Riders (*SD*)	Skiers (*SD*)	Riders (*SD*)	Skiers (*SD*)	*p*	Effect Size (*d*) Riders
BDI-II	6.05 (4.15)	5.64 (2.92)	4.14 (4.30)	3.86 (3.01)	≤ 0.005	0.46
BAI	9.85 (9.40)	8.93 (6.43)	7.52 (8.50)	7.14 (6.04)	≤ 0.005	0.27
RSES	21.57 (5.18)	20.50 (2.98)	24.29 (4.73)	23.21 (3.17)	≤ 0.005	0.57

BDI-II = Beck Depression Inventory-II; BAI = Beck Anxiety Inventory; RSES = Rosenberg Self Esteem Scale.

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Table 2. Responses to the adjective checklist items.

`	Riders		Skiers		
	%	*n*	%	*n*	*p*
I have more …					
Confidence	100	21	71	10	≤ 0.05
Motivation	33	7	14	2	ns
Sense of mastery	52	11	43	6	ns
Self-esteem	91	19	36	5	≤ 0.05
Willingness to take risks	19	4	36	5	ns
I have improved my …					
Interpersonal relationships	62	13	36	5	ns
Social skills	38	8	5	1	≤ 0.05
I feel more …					
Happy	100	21	100	14	ns
Optimistic	43	9	29	4	ns
Outgoing	19	4	14	2	ns
Trusting	100	21	100	14	ns
Hopeful	52	11	0	0	≤ 0.05
Peaceful	10	2	0	0	ns
Cheerful	43	9	21	3	ns
I feel less …					
Stressed	43	9	78	11	≤ 0.05
Sad	86	18	64	9	ns
Shy	62	13	50	7	ns
Guilty	24	5	0	0	≤ 0.05
Disappointed	24	5	14	2	ns
Frustrated	38	8	21	3	ns
Negative	52	11	29	4	ns
Anxious	57	12	43	6	ns
Angry	24	5	36	5	ns
Withdrawn	86	18	57	8	≤ 0.05
Scared	38	8	7	1	≤ 0.05
Lonely	62	13	29	4	≤ 0.05

ns = non-significant.

This was also the case for the scores on the BDI-II. An analysis of variance revealed that depression scores were significantly lower for both groups after participating in the programs ($F_{(1,33)} = 60.57$, $p < 0.005$), with no interaction effect for program. An additional analysis confirmed that post-program scores were not significantly different between the two groups ($F_{(1,33)} = 0.046$, $p = 0.83$).

In contrast, according to the checklist data, riders gained more from their program than did the skiers. A significant number of riders compared with skiers endorsed positive changes in eight of the 26 items. A higher proportion of riders indicated that they felt more hopeful (Pearson $\chi^2_{(1)} = 10.69$, $n = 35$, $p = 0.001$), less guilty (Pearson $\chi^2_{(1)} = 3.89$, $n = 35$, $p = 0.049$), less withdrawn (Pearson $\chi^2_{(1)} = 3.59$, $n = 35$, $p = 0.05$), less scared (Pearson $\chi^2_{(1)} = 4.21$, $n = 35$, $p = 0.04$), and less lonely (Pearson $\chi^2_{(1)} = 3.73$, $n = 35$, $p = 0.05$). They also reported having more confidence (Pearson $\chi^2_{(1)} = 8.74$, $n = 35$, $p = 0.003$), more self-esteem (Pearson $\chi^2_{(1)} = 11.69$, $n = 35$, $p = 0.001$), and better social skills (Pearson $\chi^2_{(1)} = 4.21$, $n = 35$, $p = 0.04$).

It is notable that, of the 18 remaining items, more riders than skiers endorsed all but five. These five included happy and trusting, which were endorsed by 100% of both groups. The skiers were more likely to endorse feeling less stressed, less angry, and more willing to take

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risks. In summary, riders felt more positive regarding 21 of the items and of those, the difference between riders and skiers was statistically significant for eight items.

Normally when multiple chi-squared analyses are performed the Bonferroni correction should be used and in this case a more stringent significance level ($\alpha = 0.005$) would apply. If the Bonferroni correction were to be applied, only the data for confidence, self-esteem, and hopefulness would have been significant. However, given the exploratory nature of this part of the data, all significant results were reported.

Interview Data

Because of the low number of skiers who agreed to be interviewed, we could not make a meaningful comparison between the two groups. However, the themes that emerged from the riders' interviews are worth mentioning because they point to avenues for further research.

Participants talked a great deal about relationships with the horses, but also about building relationships and friendships with other riders, staff, and volunteers. They described a sense of belonging, acceptance, and inclusion. They cited these relationships as an important motivator for returning to the program.

The riders emphasized how much they enjoyed just being around the horses. They liked grooming them and giving them treats and special attention. There was a sense of connection and attachment in the way individuals spoke about the different personalities of the horses. As a result of these factors, participants were much more motivated to attend therapeutic riding classes in comparison with attending traditional physiotherapy.

Riders (or, in some cases, their parents) also noted an increase in self-esteem. They described feeling better about themselves and having a sense of accomplishment and pride for developing a skill. Also, there seemed to be a sense of prestige that went along with interacting with horses and being able to control the animal and know how to ride. As one participant noted, "Not everyone can ride a horse." This confidence carried over into their relationship with peers in everyday life. For example, the mother of an autistic child noted that her son took a photo of "his horse" to school. The horse was something he could talk about with his peers and, rather than being marginalized, was able to form connections with others at school.

Discussion

This study investigated the mental health benefits of therapeutic riding for people with disabilities in comparison with therapeutic skiing for people with disabilities. Although the primary purpose of both programs is to address physical difficulties through recreation, both riding and skiing had a moderate but positive impact on three psychometric measures—anxiety, depression, and self-esteem. However, these changes were not, for all practical purposes, clinically significant. This might be expected since, with the exception of one rider with autism, none of the participants had any apparent mental health difficulties and all pre-program scores on the psychometric measures were within normal parameters. Furthermore, most of the participants had been previously involved in their activity, so perhaps there was a limited possibility for gain. It is important to keep in mind that the riding program, like the skiing program, is designed to address sensory motor issues, rather than mental health. Therefore, we might expect to see a more dramatic effect in populations with mental health difficulties especially if a program has a psychotherapeutic component. Possibly the improvement in scores would be more pronounced among groups with no previous experience. These are hypotheses that can be tested in future research.

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Contrary to the hypothesis, there was no difference in effect between the two programs on the psychometric measures. However, this was not the case with the overall results from the adjective checklist. The checklist included descriptors of mood, emotion, and sense of self that are related to general wellbeing rather than psychopathology. On these measures, riding was shown to be more beneficial than skiing for many of the descriptors. Recall that Ewing et al. (2007) also found a difference in outcome depending upon the measures. They found that an EAP program for severely disturbed children had no effect on measures of psychopathology. Yet, according to the case studies, some of the children became more communicative and a few improved sufficiently to be integrated into a regular school program. In other words, there was a conspicuous improvement that was not captured by standard measures. In our case there was a conspicuous difference on non-standard measures between riders and skiers that was not captured by standard measures.

Admittedly there are methodological issues with Ewing et al.'s (2007) anecdotal evidence, and the reliability and validity of our adjective checklist as well as the data from our interviews are yet to be demonstrated. But, taken together, this information does suggest that researchers should rethink where we "shine the flashlight." Rather than looking at psychopathology, perhaps we should be focusing on the impact of equine programs on variables related to general wellbeing, quality of life, sense of self and, as our interview data suggest, quality of relationships. Or, as Rosenbaum (2009) observes regarding a riding program for children with cerebral palsy, perhaps these programs should be considered in the context of the World Health Organization's International Classification of Functioning, Disability and Health, where "participation [itself] is one of the goals in life (p. 88)."

Much of our interview data focused on relationships with the horse which expanded to include staff, volunteers, and peers. This is consistent with research that has shown that the presence of an animal enhances communication (Corson et al. 1977; Robb, Boyd and Pristash 1980; Francis, Turner and Johnson 1985; Eddy, Hart and Boltz 1988; Hunt, Hart and Gomulkiewicz 1992; Nielson and Delude 1994; McNicholas and Collis 2000) and perception of others (Schneider and Pilchak Harley 2006), suggesting that building a relationship with a horse might generalize to improved relationships with humans. Therefore, another focus that might prove fruitful would be to examine the impact of equine-related therapy on building relationship skills in comparison with other similar programs that are not equine related.

One of the contributions of the present study is the use of a comparison group. The design was quasi-experimental in which the participants in each group were self-selected. Technically, an experimental design with participants randomly assigned to treatment groups would be more rigorous. However, we believe that a quasi-experimental design has greater ecological validity—that is, it mirrors what happens in real life. People relate to activities such as riding or skiing based on personal preference with an emotional component, in contrast to clinical trials in which the groups are virtually the same from the participants' perspective. People who choose therapeutic riding arguably have some connection to or interest in horses. That interest is part of what engages participants and keeps them coming back.

In situations where participants would be willing to be randomly assigned to groups, with and without horses, randomized trials would be informative especially in determining whether equine programs can benefit people with a range of attitudes toward horses. The results of our analysis regarding scores on the PAS-M suggest that a strongly positive attitude toward animals is not a prerequisite for benefitting from a therapeutic riding program. However, as there

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were no participants with a strongly negative attitude, we cannot determine whether those people would benefit from an ERT program. Further research could be strengthened by including participants with a wider range of attitudes. The relationship between wellbeing and attitudes toward animals and toward horses, in particular, is an area of study that could help in determining who would benefit the most from ERT programs.

In summary, this research has demonstrated support for the hypothesis that programs that incorporate horses can contribute to mental health, and may be more effective than similar programs without an equine component. The field of ERT merits further research to identify the contribution of the bond with the horse, the characteristics of participants who would benefit the most, and the specific mental health variables that might be most influenced.

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