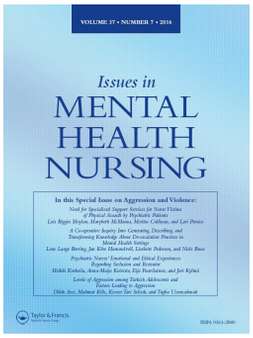

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Equine-Assisted Therapeutic Interventions Among Individuals Diagnosed with Schizophrenia. A Systematic Review

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ABSTRACT

Persons diagnosed with schizophrenia are not sufficiently offered health promotion interventions, notwithstanding their increased risk of bodily ill health. Physical activity is found to improve health and decrease psychiatric symptoms although, there is a challenge to motivate and increase physical activity in people with schizophrenia and innovative evidence-based treatment interventions are needed. The aim was to systematically review studies concerning equine assisted interventions among individuals diagnosed with schizophrenia. The findings of the six included articles indicate that therapeutic equine assisted interventions could be beneficial for individuals with severe mental illness such as schizophrenia or schizophrenia like disorders.

Introduction

Individuals with persistent psychiatric disabilities as schizophrenia are at increased risk of developing metabolic syndrome, cardiovascular disease and diabetes type 2. Studies show, for example, that these individuals are almost twice as likely to die a premature death from cardiovascular disease compared to the general population (De Hert, Schreurs, Vancampfort, & Van Winkel, 2009; Ösby, Correia, Brandt, Ekbom, & Sparen, 2000a) with a shortened life expectancy by up to 25 – 30 years (Newcomer, 2007). The causes are related to weight gain, inactive lifestyle, smoking, poor diet and side effects associated with antipsychotic medication (Ösby et al., 2000a). Another contributing factor to the increased risk of cardiovascular disease is that persons with prolonged psychiatric disabilities often have limited access to general health care, and are not offered preventive care and health promotion to the same extent as other populations notwithstanding the increased risk of bodily ill health (De Hert et al., 2009; Newcomer, 2007).

Background

According to people with severe mental illness, it´s of importance that their mental and physical health is inseparable and that they are treated as a whole person (Blanner Kristiansen et al., 2015; Blomqvist, Sandgren, Carlsson, & Jormfeldt, 2018). However, findings indicate that organizational issues as lack of resources forces the psychiatric health care professionals to prioritize between the mental and physical health problems (Blanner Kristiansen et al., 2015). The mental health nurse is a key person of the psychiatric team and is in the position to encouraging physical activity and legitimizing its incorporation within care planning (Faulkner & Biddle, 2002). Providing relevant health promotion is also one of nurse's core values Gorczynski, Firth, Stubbs, Rosenbaume, and Vancampfortf (2016), pointing at health care staff have an important role in doing so. These efforts to promote activity and a healthy lifestyle for patients with schizophrenia should be the shared responsibility of all mental health care providers (Vancampfort et al., 2011). At present, promotion of general health and prevention of illnesses accessible for people with long lasting mental disability such as schizophrenia is not sufficient (Lambert & Newcomer, 2009), although, physical activity have been shown to improve mental health (Acil, Dogan, & Dogan, 2008; Beebe et al., 2005; Erdner & Magnusson, 2012).

There is clear evidence for health benefits of physical activity, adequate nutrition and a healthy lifestyle in the general population (Eriksson, Jansson, & Hamberg, 2006). Based on current recommendations of The Swedish National Institute of Public Health (2008) all individuals should be physically active for at least 30 minutes preferably every day. More specifically, The Swedish National Institute of Public Health (2008) recommended that individuals should engage in activities with at least moderate intensity, and additional effects on health may be obtained by increasing the daily amount or intensity. Studies indicates that this is equally important for individuals with mental illness (Happell, Platania-Phung, & Scott, 2014). Vancampfort et al. (2011) found that persons with schizophrenia should do at least 150 min a week of moderate-intensity, or 75 min

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/imhn.

of moderate- to vigorous-intensity aerobic activity to achieve substantial health benefits. Moreover, physical activity has beneficial effects on obesity as well as psychiatric symptoms such as depression and anxiety among individuals with schizophrenia (Acil et al., 2008; Beebe et al., 2005; Erdner & Magnusson, 2012; Pelham, Campagna, Ritvo, & Birnie, 1993). Just as the opposite, reduced mobility and low level of physical activity has been highlighted as a risk factor for illness (Nyboe & Lund, 2013).

However, persons with severe mental illness, especially women, are less physically active than general population (Daumit et al., 2013). Moreover, a lack of self-efficacy in combination with lack of support have been described as barriers for participation in health promoting activities (Usher, Foster, & Park, 2006). Several interventions to increase physical activity have been performed for people with poor mental health. Despite these attempts with health promotion interventions, it seems difficult for people with severe mental illness to continue the activities when the studies are completed (Bonfioli, Berti, Goss, Muraro, & Burti, 2012; Hjorth, Davidsen, Kilian, & Skrubbeltrang, 2014; Papanastasiou, 2012). It is recommended that new and innovative interventions focusing specifically on difficulties related to inactivity, apathy and lack of motivation related to physical activities should become a part of treatment and rehabilitation for people with schizophrenia (Nyboe & Lund, 2013). Taking into account the barriers of physical activity faced by people with schizophrenia, nature based physical activity, as equine-assisted therapy may be an option.

Equine-assisted Interventions

Equine-Assisted Interventions (EAIs) could be seen as an umbrella concept for interventions in which horses are an integral part of the therapeutic process in mental health treatment (Lee, Dakin, & McLure, 2016). Different kinds of equine assisted interventions have the common attribute to overcome some of the limitations of traditional therapies, exclusively relying on language as a medium for change (Wilson, Buultjens, Monfries, & Karimi, 2017). For example, Equine-Assisted Therapy (EAT) involves horses as a therapeutic medium and Equine-Assisted Psychotherapy (EAP) usually comprises a collaborative effort between a licensed therapist and a horse professional working with clients to address treatment goals (Lee et al., 2016). EAP has recently become an increasingly widespread innovative rehabilitation intervention that has demonstrated biopsychosocial benefits and therapeutic outcomes in various types of mental health (Lee et al., 2016; Wilson et al., 2017). Most research has addressed children and adolescents and findings suggest a range of improvements. Findings from studies including young people with anxiety and depression, indicated increases in confidence, self-esteem and assertiveness, as well as a decrease in undesirable behaviours (Bachi, Terkel, & Teichman, 2012; Wilson et al., 2017). Furthermore, equinity-assisted therapy provides support for improving the ability of young people to communicate and relate to others and increase the emotional and social impact of children and adolescents functional ability (Lee et al., 2016). Studies on adults with mental illness are more scarce. Participants with substance use disorder, have described their relationship with horses as understanding, non-judgmental, emotional, fun, and as educational and therapeutic (Kern-Godal, Brenna, Kogstad, Arnevik, & Ravndal, 2016). However, some researchers claim that the current evidence base of Equine Related Treatment (ERT) for mental disorders does not justify the marketing and utilization of such treatments (Anestis, Anestis, Zawilinski, Hopkins, & Lilienfeld, 2014). Animal-assisted therapies are also used as alternatives or complement to call therapy as a way to overcome the constraints of therapies that rely on verbal communication as the only means of change associated with (Wilson et al., 2017).

Previous findings regarding equine-assisted therapeutic interventions for individuals with different psychiatric diagnoses suggest a range of improvements within psychiatric clients, including increases in confidence, self-esteem and confidence in social interactions, as well as a decrease in undesirable behaviours. However, the lack of understanding in the wider community about EAT has been perceived as a barrier to recognition and acceptance as a valid therapeutic intervention.

Aim

The aim of the paper was to systematically review studies concerning equine-assisted therapeutic interventions among adult individuals diagnosed with schizophrenia.

Method

A mixed systematic review was conducted according to the recommendations of Pluye and Hong (2014), which includes following seven stages: formulating answerable questions, defining the eligibility criteria, applying the search strategy, identifying relevant studies, selecting relevant studies, apprising study quality and extraction and reporting results.

Formulating Answerable Questions

The questions of this review were formulated to identify and narrow the focus on the conducted equine-assisted intervention, the study design and possible outcomes and benefits of the conduced equine assisted interventions. These questions included:

1) What types of equine-assisted therapeutic interventions characteristics have been evaluated?
2) What types of study designs have been used to evaluate equine-assisted therapeutic interventions?
3) Which outcomes, effects and possible benefits of equine-assisted therapeutic interventions have been proven?

Defining Eligibility Criteria

Defined as relevant criteria for publications according to the aim and the identified research questions were qualitative and quantitative empirical peer-reviewed papers, published in English during the period from 2000 to 2016. Furthermore, eligibility criteria were articles which concerned people aged 18–65 years with schizophrenia or schizophrenia like diagnoses that had participated in equine assisted interventions such as equine assisted therapy and therapeutic horseback riding. Studies excluded from this review were studies focusing on children or other diagnoses than schizophrenia.

Applying The Search Strategy

The systematic literature search for relevant papers in electronic database sources was conducted in February 2017 in five electronic databases, incorporating CINAHL, Pubmed, PsycInfo, ScienceDirect and in Scopus. To our help to identify relevant articles the authors discussed search terms with an experienced librarian who also did the final search. Our intention was to capture articles that used equine-assisted interventions among adult persons diagnosed with schizophrenia. In order to narrow and to expand the search we used search tools such as medical subject headings (MESH), Boolean search operators and truncation. In all databases, single and combined search terms included the key words: ""Equine-Assisted Therapy"[Mesh] AND (psychiatr* OR schizophren*)", "schizophrenia AND (horse OR horses OR horseback OR hippotherapy)".

Identifying Relevant Studies and Study Selection

The initial searches identified 165 articles related to the topic, when duplicates were removed by automation supplemented with manual checking, 161 articles were catalogued in EndNote®. Most of the excluded articles were removed because they did not explicitly describe participants as persons with schizophrenia or schizophrenia like diagnoses. Furthermore, some of the excluded articles involved animal-assisted interventions but not horses and finally some articles were excluded because they included children or youths as participants. Altogether, after scanning of title and abstracts, 21 articles remained as potentially relevant articles and read by the authors in full text. The reference lists in these articles were also examined for additional articles to be included. Finally, six articles were included in the present review; all of these articles came from the three databases CINAHL, PubMed and Scopus. Study inclusions and exclusions are illustrated in the PRISMA flow figure (Figure 1). Included and reviewed articles are marked with an asterix * in the reference list.

Qualitative Assessment

To grade the quality of the evidence of the studies, each study was rated by a quality rating template. Three versions of methodological quality rating templates were used based on the included articles methodology. One version for qualitative research and other versions for the observational study and for the included randomized study. All templates are used by the Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU, 2017). These templates are used to assess the extent to which the result of an individual study is due to systematic errors (bias). The templates are based on different questions of study relevance, reliability, consistency, transferability and precision of the data collected. The strengths of evidence in the templates was graded according to quality; high, medium or low quality.

Data Extraction and Analysis

The authors read each article several times in order to become familiar with the content. Data were extracted and recorded for each study and a data-charting form was developed to extract data from the full text articles (Table 1). The following key information was extracted and chartered: reference, setting, participants' characteristics (age, sex and diagnosis), and study aim, equine activity intervention and study conclusion.

Results

The results presented comprises six articles, four qualitative and two quantitative, published in international scientific journals. In total, the articles cover 137 individuals diagnosed with schizophrenia or allied disorders participating in equine assisted interventions such as equine-assisted therapy or therapeutic horseback riding. The included articles are structured in chronological order with regard to the content in the program of therapeutic interventions, the study design of the inquiry, and considering the described outcome and possible utility of the intervention in the context of mental health nursing.

Equine Assisted Therapeutic Interventions

Among the six reviewed articles, the participants received different therapeutic equine-assisted interventions. Most of the studies used bonding activities with the horses such as building trust and a relationship between the participants and the horses (*Bizub, Joy, & Davidson, 2003; *Cerino, Cirulli, Chiarotti, & Seripa, 2011; *Corring, Lundberg, & Rudnick, 2013; *Nurenberg et al., 2015). Only one study included common stable work (*Burgeon, 2003), where the participants participated in mocking out. In this study, the participants also participated in horse related activities such as grooming, to learn to look after the horses. Four of the studies involved horseback riding as an activity (*Bizub et al., 2003; *Burgeon, 2003; *Cerino et al., 2011; *Corring, Johnston, & Rudnick, 2010; *Corring et al., 2013;). In the additional study by *Nurenberg et al. (2015) the participants were allowed to lead the horses but horseback riding were not included in the therapeutic activities. Table 2 summarizes finding of therapeutic activities in the reviewed equine-assisted interventions.

Methodological Design of Equine Assisted Therapeutic Intervention

Besides the horse related therapeutic activity the studies could involve additional therapeutic contents. They also varied in design according to how often the activity was carried out, the duration of the session and those who participated in addition to the person who had the mental illness. Below is a brief summary of the included articles' designs (Table 3). *Bizub et al.,(2003) tested a program comprising three phases 1) bonding activities with the horse, 2) mounted activities, and 3) post-riding processing groups. The total time individuals were engaged in the program were two hours weekly and the duration of the program was ten weeks.

The sessions in the study of *Burgon (2003) comprised of learning to look after the horses and carrying out stable management tasks, in addition to the riding as an important factor of the horse-back riding therapy was building up a relationship and trust with the horses on the ground (*Burgon, 2003). The instructors matched riders with particular horses at the start of

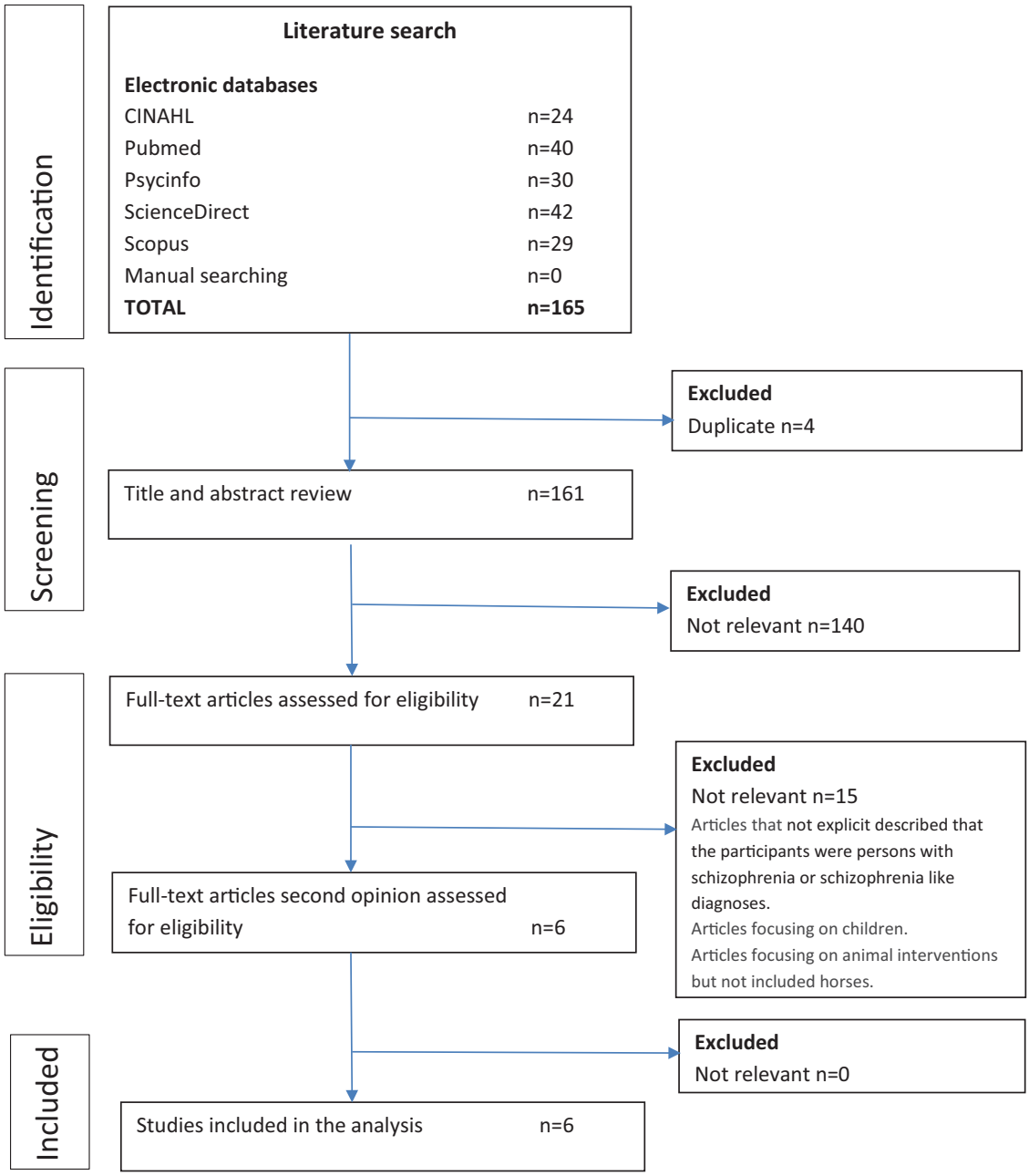

Figure 1. PRISMA chart of literature search and selection.

the project according to experiences, temperament of the horse, and size and weight of the participant. The sample group consisted of six adult females aged between 30 and 40 years with conditions including depression, schizophrenia, psychotic illness and nervous breakdowns. The group, who received riding therapy on a weekly basis, had been running for approximately two months prior to the study began and the researcher was following the group's progress once a week over a six-month period (*Burgon, 2003).

The intervention in the study of *Corring et al., (2010) consisted of ten weekly, one and a half hour-long, horseback riding group sessions. Each group consisted of three patients and three recreation staff members, with each recreation staff member providing support to one single patient. The weekly sessions also included a group drive between the hospital and the horseback riding agency and a lunch after the session (*Corring et al., 2010).

The study conducted by *Cerino et al., (2011) was a multicenter research project aimed at testing the potential effects of therapeutic riding among individuals diagnosed with schizophrenia. The therapeutic riding setting included the participant, the horse and a therapist specialized in equestrian rehabilitation. The equip included a mental health physician and a trained veterinarian which ensured animal welfare throughout the study (*Cerino et al., 2011). Therapeutic riding sessions were held once a week for 24 months, from 2009 to 2010, with a total number of 40 sessions for each participant. A meeting to support the participant to relate to the horse's specific communication codes and its own mental functioning preceded the therapeutic riding sessions. The participants were instructed to put themselves

Table 1. Characteristics of the articles included in the systematic review.

Reference, country, Database	Title	Aim	Method Sample	Conclusion	Scientific quality
Bizub, A. L.,Joy, A., & Davidson, L. 2003 USA Cinahl	"It's like being in another world': demonstrating the benefits of therapeutic horseback riding for individuals with psychiatric disability	The aim of the study was to describe an attempt to create a therapeutic riding program for individuals with severe and persistent psychiatric disabilities.	Qualitative evaluation design Five adults with longstanding histories of psychiatric disabilities. Data were collected through semi- structured interviews after a ten-week therapeutic horseback riding program.	By the end of ten weeks, the riders reported success in learning basic horsemanship and, in doing so, also reported additional psychosocial benefits, including an augmented sense of self-efficacy and self-esteem. In sum, this adjunctive therapy can facilitate the recovery process.	Medium
Burgon, H. 2003 United Kingdom Scopus	Case studies of adults receiving horse-riding therapy	The purpose of this study was to examine the psychotherapeutic effect of riding therapy (RT)	Qualitative case study design. Six women with various severe mental health problems received RT on a weekly basis. Methods employed was observation, interviews and questionnaires at each session over the course of six month.	It was found that the participants benefited in areas ranging from increased confidence and self-concept, and that the therapy aided social stimulation and led to transferable skills being acquired	Medium
Cerino, S., Cirulli, F., Chiarotti, F., & Seripa, S. 2011 Italy PubMed	Non conventional psychiatric rehabilitation in schizophrenia using therapeutic riding: the FISE multicentre Pindar project	The research project aimed at testing the potential effects of therapeutic riding on schizophrenic patients.	Quantitative longitudinal design. Twenty-four subjects with a diagnosis of schizophrenia, males and females age 18–40. Ten patients had been diagnosed with early schizophrenia no more than 5 years disease- and fourteen with a chronic one. They were enrolled for a 1 year-treatment involving therapeutic riding sessions. All subjects were tested at the beginning and at the end of treatment with a series of validated test batteries (BPRS and 8 items-PANSS).	The results discussed in this paper point out an improvement in negative symptoms, a constant disease remission in both early onset and chronic disease subjects, as well as a reduced rate of hospitalization.	Medium
Corring, DJ., Johnston, ME., & Rudnick, A 2010 Canada Cinahl	Effects of a supported program for horseback riding on inpatients diagnosed with schizophrenia: a qualitative exploratory study	The aim was to investigate the use of THR with a group of adult mental health care inpatients diagnosed with schizophrenia or schizoaffective disorders.	Qualitative exploratory design. Six inpatients diagnosed with schizophrenia, accompanying staff as well as the THR instructor were interviewed over a few points in time with semi-structured interviews.	THR was found to be beneficial for this group of inpatients; in particular, they enjoyed themselves. In conclusion, THR has promise for this population, possibly as an enhancer of enjoyment, among other things, and should be further developed and studied for individuals with schizophrenia of varying severity.	High
Corring, D., Lundberg, E., & Rudnick, A. 2013 Canada PubMed	Therapeutic horseback riding for ACT patients with schizophrenia	The aim was to examine THBR for Assertive Community Treatment (ACT) patients with schizophrenia	Longitudinal qualitative design. A sample of 6 ACT patients with schizophrenia or schizoaffective disorder who reside in the community and 6 mental health care staff participated in 10 weeks of weekly horseback riding sessions. Participating patients, staff and the THBR instructor were qualitatively interviewed at the start, during and at the end of the THBR program.	THBR benefitted this group of patients. In spite of our study's limitations, such as its exploratory nature and the small sample size, it demonstrates that THBR has promise and should be further developed and studied for individuals with schizophrenia.	High
Nurenberg, J., Nurenberg, J. R., Schleifer, S. J., Shaffer, T. M., Yellin, M., Desai, P. J., Amin, R., Bouchard, A., & Montalvo, C.R. 2015 USA PubMed	Animal-assisted therapy with chronic psychiatric inpatients: equine-assisted psychotherapy and aggressive behavior	The aim was to Compare equine and canine forms of AAT with standard treatments for hospitalized psychiatric patients to determine AAT effects on violent behavior and related measures.	Comparative quantitative design 90 patients with recent in-hospital violent behavior or highly regressed behavior were randomly selected to receive ten weekly group therapy sessions of standardized equine-assisted psychotherapy (EAP), canine-assisted psychotherapy (CAP), enhanced social skills psychotherapy, or regular hospital care. Violence-related incident reports filed by staff in the three months after study intake were compared with reports two months preintake.	Covariance analyses indicated that staff can predict which patients are likely to benefit from EAP ($p = .01$). CONCLUSIONS: AAT, and perhaps EAP uniquely, may be an effective therapeutic modality for long-term psychiatric patients at risk of violence.	Medium

Table 2. Summary of equine assisted therapeutic activity in the included studies.

	Carrying out stable management tasks	Learning to look after the horses	Bonding activities with the horse	Horseback riding	Shared meal included	Transportation included
*Bizub et al., (2003)			X	X	X	X
*Burgon (2003)	X	X	X	X		
*Cerino, Cirulli, Chiarotti, and Seripa (2011)		X	X	X		
*Corring et al., (2010)				X	X	X
*Corring et al., (2013)				X		
*Nurenberg et al. (2015)			x			

from the horse point of view in order to understand the horse, a metacognitive work described as essential in psychiatric rehabilitation of individuals with psychoses (*Cerino et al., 2011).

The study of *Corring et al., (2013) examines therapeutic horseback riding for Assertive Community Treatment (ACT) patients diagnosed with schizophrenia. They found that THBR benefitted this group of patients. In spite of study limitations, such as exploratory nature and a small sample size, it shows that THBR has promise and should be further developed and studied for individuals with schizophrenia (*Corring et al., 2013).

In the randomized controlled study by *Nurenberg et al. (2015), equine and canine forms of animal-assisted therapy (AAT) were compared with standard treatments for hospitalized psychiatric patients to determine AAT effects on violent behavior and related measures. Participants received ten weekly group therapy sessions of standardized equine-assisted psychotherapy (EAP), canine-assisted psychotherapy (CAP), enhanced social skills psychotherapy, or regular hospital care (*Nurenberg et al., 2015).

Semi-structured interviews were conducted with the five participants and a qualitative analysis was used to describe how and in what way, if at all, the horseback riding program was transformative for the participants (*Bizub et al., 2003).

Through case studies, the study of Burgon (2003) sought to explore whether the participants benefited in terms of confidence, increased self-esteem and social/interaction skills. The prime objective of the study was for the riders' experience of the therapy to be expressed in their own words and to find out whether these benefits, if identified, were transferable to other areas of the participants' lives. The study utilized participant observational methodology following the progress of the six women with various severe mental health problems receiving horse-riding therapy on a weekly basis. Methods employed to record the sessions, apart from participant observation, included interviews and questionnaires (*Burgon, 2003).

The exploratory study of *Corring et al., (2010) studied personal transformation related to therapeutic horseback riding among six inpatients diagnosed with schizophrenia, who participated in 10 weekly sessions of therapeutic horseback riding. Validated transcriptions of semi-structured interviews with the participating participants and with their accompanying staff as well as with the therapeutic horseback riding instructor over a few points in time were analyzed for themes (*Corring et al., 2010).

One study enrolled twenty-four subjects with a diagnosis of schizophrenia for a 1 year-treatment involving therapeutic riding sessions (*Cerino et al., 2011) and all subjects were tested at the beginning and at the end of treatment with a series of validated test batteries (BPRS and 8 items-PANSS).

The study of *Corring et al., (2013) examined a sample of 6 ACT patients with schizophrenia or schizoaffective disorder who reside in the community and 6 mental health care staff participated in 10 weeks of weekly horseback riding sessions with an experienced THBR instructor. Participating patients, staff and the THBR instructor were qualitatively interviewed at the start, during, and at the end of the THBR program and these

Table 3. Overview of methodological designs employed in the included studies.

	Design	Data collection	Analysis of data	Sample
*Bizub et al., (2003)	Qualitative evaluation design	Interviews	Qualitative analysis	Five participants
*Burgon (2003)	Qualitative small-scale, participant observational case study design	Observational methodology interviews and questionnaires	Qualitative analysis	Six women with various severe mental health problems
*Cerino, Cirulli, Chiarotti, & Seripa, 2011	Quantitative longitudinal design	Tested at the beginning and at the end of treatment with a series of validated test batteries (BPRS and 8 items-PANSS).	Quantitative	Twenty-four subjects with a diagnosis of schizophrenia. Age 18–40. Ten have been diagnosed with early schizophrenia no more than 5 years disease and fourteen with chronic
*Corring et al., (2010)	Qualitative exploratory design	Semi-structured interviews	Qualitative analysis	Six inpatients diagnosed with schizophrenia,
*Corring et al., (2013)	Longitudinal qualitative design	Semi-structured interviews performed, before, in the middle of, and after completed intervention	Qualitative comparative thematic analysis (Boyatzis 1998)	A convenience sample of 6 ACT patients with schizophrenia or schizoaffective disorder
*Nurenberg et al. (2015)	Comparative quantitative design	Evaluation with; Overt Aggression Scale (OAS-M)], Life Skills Profile (LSP-20), Greystone Intrusiveness Measure (GIM), Pet Attitude Scale–Modified.	Analysis of variance (ANOVA) in generalized linear models (Tukey post hoc tests).	90 patients with recent in hospital violent behavior or highly regressed behavior were randomly selected

TABLE 4. Overview of the outcomes of interventions investigated in the included studies.

	Increased confidence and self-esteem	Increased activity/ learned basal horsemanship	Improved social skills	Enhanced enjoyment	Improvement in negative symptoms	Improved pharmacological compliance	Decrease in violent behavior and need for hospitalization
*Bizub et al.,(2003)	X	X	X		X		
*Burgon (2003)	X		X				
*Cerino, Cirulli, Chiarotti, and Seripa (2011)					X	X	X
*Corring et al.,	X	X		X			
*Corring et al., (2013)	X			X			
*Nurenberg et al. (2015)							X

semi-structured interviews were analyzed for recurrent themes (*Corring et al., 2013).

The study of *Nurenberg et al. (2015) included 90 patients with recent inhospital violent behavior or highly regressed behavior. Participants were randomly selected to receive ten weekly group therapy sessions of standardized equine-assisted psychotherapy (EAP), canine-assisted psychotherapy (CAP), enhanced social skills psychotherapy, or regular hospital care. Participants' mean age was 44, 37% were female, 76% had diagnoses of schizophrenia or schizoaffective disorder, and 56% had been committed involuntarily for civil or forensic reasons. Violence related incident reports filed by staff in the three months after study intake were compared with reports two months before admission to the study (*Nurenberg et al., 2015).

Outcomes and Possible Utility in the Context of Mental Health Nursing

None of the included therapy studies that were investigated reported any negative outcomes connected to the interventions. Different kinds of positive outcomes were found in the studies depending on the study aim and the design of the studies (Table 4).

*Bizub et al., (2003) found that relationships emerged between the horse and the participant and the horse was transformed from an anonymous animal to a unique and wonderful creature. The experience of the riding program was a stepping stone for individuals to learn more, to do more and to be more (*Bizub et al., 2003). Follow up with riders six months later indicated that the experience of the program had been truly significant for the participants who were reporting psychosocial benefits, including an augmented sense of self-efficacy and self-esteem.

*Burgon (2003) found that the participants benefited in areas ranging from increased confidence and self-concept, and that the therapy aided social stimulation and led to skills being acquired. The skills acquired were shown to be transferable to other areas of the participant's life (*Burgon, 2003).

In the study of *Corring et al., (2010) therapeutic horseback riding was found to be beneficial for this group of inpatients diagnosed with schizophrenia and in particular, they were able to enjoy themselves. *Corring et al., (2010) revealed that participants diagnosed with schizophrenia were able to learn basal horsemanship during ten weeks of a program with therapeutic horseback riding resulting in psychosocial benefits such as improved confidence and enhanced self-esteem among the participants. From their result, *Corring et al., 2010) conclude that therapeutic horseback riding has promise as an enhancer of enjoyment, among other things, for individuals with schizophrenia of varying severity and they recommend that therapeutic horseback riding should be further developed and studied among this target group.

The results of the study of *Cerino et al., (2011) point out an improvement in negative symptoms, a constant disease remission in both early onset and chronic disease subjects, as well as a reduced rate of hospitalization. Patients showed improvement of pharmacological compliance and a decrease of emergency interventions such as hospitalization, compulsory treatment or having to live in a nursing home, forms of care in which all patients in the study were treated before joining the therapeutic riding program (*Cerino et al., 2011).

*Corring et al., (2013) found that THBR benefitted this group of participants in terms of increased confidence and self-esteem. In spite of the study's limitations, such as its exploratory nature and the small sample size, it demonstrates that THBR has potential to promote health and well-being and should be further developed and studied for individuals with schizophrenia (*Corring et al., 2013).

The study of *Nurenberg et al. (2015) showed that interventions were well tolerated and analyses revealed an intervention group effect ($F = 3.00$, $df = 3$ and 86, $p = .035$); post hoc tests showed specific benefits of EAP (p,.05). Similar AAT effects were found forth incidence of 1:1clinical observation ($F = 2.70$, $df = 3$ and 86, $p = .051$); post hoc tests suggested benefits of CAP ($p = .058$) as well as EAP ($p = .082$). Covariance analyses indicated that staff can predict which patients are likely to benefit from EAP ($p = .01$). *Nurenberg et al. (2015) conclude that animal assisted therapy, and perhaps equine assisted therapy uniquely, may be an effective therapeutic modality for long-term psychiatric patients at risk of violence.

Strengths of Evidence of the Included Studies

Two of the included six studies were assessed as having a high grade of strengths regarding to article quality (*Corring et al., 2010; *Corring et al., 2013). The rest of the studies was graded as medium quality (*Bizub et al., 2003; *Burgon, 2003; *Cerino et al., 2011; *Nurenberg et al., 2015) and none was rated to be of low quality. The studies assessed as medium quality were unclear about how the participants were chosen and who asked them for participation. Further, both of the studies by *Bizub et al., (2003) and *Cerino et al., (2011) were unclear in terms of

ethical approval. However, they discussed safety for the horse and the participants. Most articles used a qualitative study design and some had a rather small sample size, which indicates that additional studies with a quantitative study design are needed for investigation of outcomes.

Discussion

In this review, six studies concerning equine assisted interventions among individuals diagnosed with schizophrenia were included. Equine-assisted interventions for individuals with schizophrenia have not been sufficiently examined, although it may benefit this particularly impaired and neglected population (*Bizub et al., 2003). Drawing from the findings it may be concluded that equine-assisted interventions are potentially useful as a tool in mental health nursing to facilitate remission and recovery among individuals diagnosed with schizophrenia. Equine-assisted interventions among individuals diagnosed with schizophrenia is likely to be reflected in a decrease of health service costs and, potentially, even an improvement of the user of care and the care-giver quality of life (*Cerino et al., 2011). The patient-horse relationship in equine assisted therapy or therapeutic horseback riding has been described as enabling positive attachment, reflective functioning, and emotional regulation and facilitating recovery among people with severe mental illness (*Bizub et al., 2003; *Corring et al., 2010). In addition, the qualitative interview study by *Corring et al., (2010) involving participants diagnosed with schizophrenia or schizoaffective disorder has shown that therapeutic horseback riding could be a beneficial intervention for individuals with severe mental illness.

Effects Related to Possible Utility in the Context of Mental Health Nursing

Holistic health is a main goal in nursing care and providing relevant health promotion should be one of the mental health nurse's core values. Mental and physical health are inseparable parts of a holistic health according to people with severe mental illness (Blanner Kristiansen et al., 2015; Blomqvist et al, 2018). Thus, the mental health nurse is a key person of the psychiatric team regarding supporting holistic health among individuals with severe mental illness by means of having a main responsibility to encourage physical activity and legitimize its integration within care planning (Faulkner & Biddle, 2002).

The result of this review indicate that equine-assisted interventions have the potential to facilitate recovery among individuals with schizophrenia by stimulating these individuals to take an active role in their own rehabilitation (*Bizub et al., 2003; *Cerino et al., 2011; *Corring et al., 2010). Equines assisted activities also seem to have the potential to increased confidence and self-concept, and stimulate social contact leading to skills, transferable to other areas of the participant's life, being acquired (Burgon, 2003). Also improvement in negative symptoms, pharmacological compliance, disease remission and reduced rate of hospitalization improvement (*Cerino et al., 2011). Equine-assisted therapy uniquely, may be an effective therapeutic modality for long-term psychiatric patients at risk of violence compared to other forms of animal assisted therapy or traditional care (*Nurenberg et al., 2015). All of these findings are of great importance and mental health nursing may benefit from integrating equine assisted interventions as one part of regular mental health care for people with schizophrenia. Even Florence Nightingale said that "a small pet animal is often an excellent companion for the sick, for long chronic cases especially" (Nightingale, 1969, p. 102). Equine-assisted therapy also means physical activity, which has shown beneficial effects on obesity as well as psychiatric symptoms such as depression and anxiety among individuals with schizophrenia (Acil et al., 2008; Beebe et al., 2005; Erdner & Magnusson, 2012; Pelham et al., 1993). In the current high-tech care with an emphasis on medical treatment, it could be of great importance in mental health services to consider nontraditional methods, which could bring important change to the lives of individuals with severe mental illness. Another fact that could be of importance is the opportunity to create a human-animal emotional relationship that may lead to a sustainable interest in taking part in a physical activity (Calvo et al., 2016).

Strengths and Limitations

This review used a rigorous approach following recommendations of the Swedish Agency for Health Technology Assessment and Assessment of Social Services. However, the results of the review must be interpreted in the lights of limitations. Only English language studies were included in the review, which may led to a publication bias. The small number of studies in this area made it difficult to synthesize the findings, though the small number of studies shows an urgent need for conducting additional studies in the actual knowledge area.

Conclusion

This is a review that to the best of our knowledge has systematically reviewed this group of participants´ in equine assisted interventions. Reinforced efforts directed at overall health as a complement to the existing mental health care for individuals with persistent and severe mental illness are needed to achieve improved benefits in health and economy for both the individual and the society. The findings indicate that therapeutic equine-assisted activities, including horseback riding, could be a beneficial intervention for individuals with severe mental illness such as schizophrenia or schizophrenia like disorders. The review suggests that further research is needed to establish a solid evidence base regarding equine-assisted interventions among people with severe mental illness. Findings also indicates that organizational lack of resources need to be addressed in psychiatric health care for mental health nurses to be able to prioritize interventions targeting holistic health among individuals with severe mental illness.

*Reviewed articles included in the finding section

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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