UNIVERSITI PUTRA MALAYSIA

DEMOGRAPHIC STUDY AND HEALTH STATUS OF HORSES USED FOR RIDING THERAPY

SITI BALQIS BINTI BAHARUDDIN

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FPV 2023 27

DEMOGRAPHIC STUDY AND HEALTH STATUS OF HORSES USED FOR RIDING THERAPY

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A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia
In partial fulfilment of the requirement for the
DEGREE OF DOCTOR OF VETERINARY MEDICINE
Universiti Putra Malaysia
Serdang, Selangor Darul Ehsan

DECEMBER 2023

CERTIFICATION

It is hereby certified that we have read this project paper entitled "**DEMOGRAPHIC STUDY AND HEALTH STATUS OF HORSES USED FOR RIDING THERAPY**", by Siti Balqis Binti Baharuddin and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirement for the course VPD 4999 - Project.

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ACKNOWLEDGEMENTS

I would like to thank my supervisors, Dr Wan and Dr Hayah, for their significant support and insights that helped me to write this work. Their wisdom and advice given throughout the entire project I cherished the most. I would also like to thank Dr Shima and Dr Hafiz for the assistance provided during the conduct of physical examination on the horses. Moreover, I am grateful to my family, who have supported me financially throughout the project till the completion of this study. Their belief in me has kept my spirits and motivation high during this process. I am forever thankful for the unconditional love and support.

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KAJIAN DEMOGRAFI DAN STATUS KESIHATAN KUDA YANG DIGUNAKAN UNTUK TERAPI MENUNGGANG

oleh

Siti Balqis binti Baharuddin

2023

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Terapi menunggang kuda untuk keperluan khas melibatkan penggunaan kuda dan aktiviti berkaitan kuda untuk membantu kanak-kanak yang mengalami kecacatan seperti autisme, sindrom down, dan serebral palsi. Walaupun terdapat maklumat yang diterbitkan mengenai manfaat terapi menunggang kuda, sedikit yang diketahui tentang maklumat demografi dan status kesihatan kuda yang digunakan untuk terapi menunggang di Malaysia. Kajian ini bertujuan untuk mengumpul data mengenai penggunaan, kesihatan, dan penjagaan kuda yang digunakan untuk terapi menunggang di Malaysia. Satu soal selidik sebanyak 17 item diedarkan kepada dua pengurus kandang kuda yang beroperasi di pusat terapi menunggang yang berbeza di bawah *Riding for the Disabled Association Malaysia* (RDA Malaysia) yang terletak di Selangor dan Terengganu. Pemeriksaan fizikal dilakukan terhadap 12 ekor kuda yang digunakan untuk terapi menunggang di tempat yang sama. Kemudian, ujian korelasi dilakukan untuk mencari hubungan antara data soal selidik dan penemuan pemeriksaan fizikal. Hasil menunjukkan bahawa populasi didominasi oleh kuda poni, dengan jumlah yang sama bagi kuda kembiri dan betina. Kebanyakan kuda berusia lebih dari 20 tahun, dan diberi senaman ringan harian. Sesi terapi menunggang biasanya 40 minit, dengan kekerapan sekali hingga tiga kali seminggu. Kebanyakan kuda disumbangkan kepada program oleh pemilik masing-masing dan telah menyertai program selama kira-kira 7 tahun. Walau bagaimanapun, tingkah laku yang tidak baik adalah alasan umum untuk mengecualikan kuda yang berpotensi atau kuda semasa dari program. Program kasut kuda sesuai, dan kebanyakkan memakai kasut depan dan belakang. Masalah kesihatan utama adalah kepincangan kaki, dengan NSAID untuk kepincangan dan alasan lain sebagai rawatan yang paling biasa diterima. Kuda-kuda ditempatkan dengan sama rata di dalam kandang, dan kandang serta kawasan kering apabila tidak bekerja. Penilaian kesihatan dijalankan secara rutin oleh kakitangan setiap hari. Semua pengurus kuda mengakui kepentingan pemeriksaan fizikal, menyedari kod amalan kebajikan sedia ada, dan menganggap rejim pemakanan sebagai faktor penyumbang penting dalam pengurusan terbaik untuk premis tersebut. Penemuan pemeriksaan fizikal menunjukkan bahawa 66.7% kuda tidak sihat dan kebanyakannya mengalami masalah ringan. Ujian Korelasi Spearman tidak signifikan disebabkan saiz sampel yang kecil. Kesimpulannya, majoriti kuda dijaga mengikut standard yang diterima dan kebanyakan kuda mengalami tahap penyakit ringan tetapi dijaga dengan baik.

Katakunci: kuda, terapi menunggang, kepincangan, kebajikan

ABSTRACT

An abstract of the project paper to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999 – Final Year Project

DEMOGRAPHIC STUDY AND HEALTH STATUS OF HORSES USED FOR RIDING THERAPY

by

Siti Balqis binti Baharuddin

2023

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Co-Supervisor : Associate Professor Dr Nurul Hayah Khairuddin

Riding therapy for special needs is the use of the horse and equine-oriented activities to help children with disabilities such as autism, down syndrome and cerebral palsy. While there are published information regarding the benefits of riding therapy, little is known about the demographic information and health status of horses used for riding therapy in Malaysia. This study aims to gather data regarding the use, health, and care of horses used for riding therapy in Malaysia. A 17-item questionnaire was distributed to two stable managers of different riding therapy operation centers under Riding for the Disabled Association Malaysia (RDA Malaysia) located in Selangor and Terengganu. A physical examination was performed on 12 horses used for riding therapy in the same premise. Then, a correlation test was performed to find associations between survey form data and physical examination findings. Results indicated that the population was predominated by ponies, while equal number of mares and geldings. Majority of the horses are more than 20 years old. These horses are commonly subjected to light exercise as part of their routine. A typical riding therapy consisted of a 40-minute lesson per session, and there is equal distribution for programme frequency between once per week and three times per week. Most horses were donated to the programme by their respective owners, and have participated in the programme for approximately 7 years. However, misbehaviour was the common reason to exclude potential or current horses from the programme. The shoeing programme is appropriate and the majority of these horses had front and rear shoes fixed. Limb lameness was the top health issue noted, with NSAID for lameness and other reasons as most common treatment received. Horses are equally housed in the stall, and stalls & dry lot when not working. Health evaluation is routinely conducted by staff on a daily basis. All stable managers acknowledge the importance of physical examination, aware of the existing welfare code of practise, and considered the feeding regime as an important contributing factor in the best management practise for the premise. Physical examination findings revealed that 66.7% of the horses are not healthy and mainly having minor degree of ailments. Spearman's Correlation test was performed and the result was non-significant due to small sample size. In conclusion, majority of the horses used for riding therapy are cared for appropriately according to the accepted standard and majority of the horses used for riding therapy have minor degree of ailments but well cared for.

Keywords: horse, riding therapy, lameness, welfare

CHAPTER 1
INTRODUCTION

1.1 Background of Study

Riding therapy for special needs is the use of horse and equine-oriented activity to help children with a variety of medical conditions like autism, cerebral palsy, and Down syndrome to achieve a variety of therapeutic goals. There has been increased demand in the last few years for riding therapy (Sathyabama, 2019) due to the growing number of children diagnosed with autism in Malaysia.

Riding for the Disabled Association, Malaysia (RDA Malaysia) is one of the equine-related associations that provide riding therapy to a range of special needs condition children, from those with Down syndrome to autism to those who are wheelchair-bound. There are 11 riding therapy operation centers under RDA Malaysia currently in the country.

There is growth in this health and care sector due to the benefits it can provide at physical, cognitive, emotional, and social well-being levels (Ward et al., 2013). For example, horse riding therapy improves balance and self-confidence.

In Malaysia, there is little information regarding the demography and health status of the horses involved. This present information regarding these aspects may be used as one of the welfare indicators for the horses used for riding therapy in the country. Better care by those working with therapy horses can be accomplished by knowing horse management and their disease prevalence (Williams et al., 2018).

The Department of Veterinary Services Malaysia (DVS Malaysia) has developed the Animal Welfare Codes: Horse Riding and Spelling Activities (2019) that covers the standard guidelines on animal welfare to improve premises' practices and welfare of horses used for therapy. The accreditation or certification is given by DVS Malaysia to premises that adhere closely to the published guidelines.

1.2 Problem Statement

Horse riding therapy is able to provide many benefits to the disabled children from the aspect of physical, cognitive, social well-being and emotional level. While there is ample research on riding therapy benefits, there is little information regarding the demography and health status of the horses involved. Data from this outreach education work could provide information regarding the current state of horses used for this purpose and may indirectly raise awareness regarding horse welfare to the parties involved in the equine industry.

1.3 Objectives

1. To gather data regarding horse use, health and care in riding therapy

2. To assess the health status of horses used for riding therapy

1.4 Study hypotheses

$H1_0$: Horses used for riding therapy are not cared for appropriately according to an accepted standard

$H1_A$: Horses used for riding therapy are cared for appropriately according to an accepted standard

$H2_0$: Horses used for riding therapy are healthy and well cared for

$H2_A$: Horses used for riding therapy are not healthy and not well cared for

CHAPTER 2
LITERATURE REVIEW

2.1 Riding Therapy

There has been increasing interest in animal-assisted interventions (AAIs) as an effective therapy option for children with a variety of medical conditions like autism, cerebral palsy, and Down syndrome. According to O'Haire (2010), this directed and structured intervention involves connecting children with autism spectrum disorder (ASD) to nature, the environment, and animals via structured activities. Horse riding therapy is one kind of animal-assisted intervention that provides certain activities on horses to build a therapeutic interaction and communication between the riders and horses (Lessick et al., 2004). This alternative treatment impacted the riders at physical, cognitive, emotional, and social well-being levels (Ward et al., 2013).

2.2 Horse Selection Criteria for Riding Therapy

According to Engel (1992), the crucial parameters to examine when selecting a horse suitable for any therapeutic riding programme are health, conformation, gait quality, and temperament. Temperament is one characteristic that is very difficult to assess objectively. The desired behaviour of horses for therapeutic riding is calm, tolerant, consistent temperament, and not highly reactive to novel stimuli. Abdel-Azeem (2021) stated that there were significant associations between sex and breed with temperament, but there was no significant association between age and temperament.

2.2.1 Gender

Fenner et al. (2019) defined geldings as calm, reliable, trainable, and predictable; mares as safe, bossy, trainable, willing, and having a good attitude; while stallions are labelled as being difficult, bossy, trainable and have a good attitude. Another study by O'Brien (2014) indicated that stallions can become aggressive and difficult to work with when they reach sexual maturity. These assumptions are consistent with findings from a demographic study by Watson et al. (2020), who reported that geldings and mares are commonly used in riding therapy

programmes, with geldings outnumbering mares, and an absence of stallions. The combination of mares and geldings are common, possibly due to the non-significant behavioural differences between mares and geldings when ridden (Aune et al., 2020).

2.2.2 Age

According to Anderson et al. (1999), older horses tend to be more even-tempered than younger horses, which can be supported by Seaman et al. (2002), where young horses demonstrate greater inquisitiveness and less fear. This idea aligned with a demographic study by Watson et al. (2020), where the majority of horses used in riding therapy programme are between 16 and 20 years old, and horses that are more than 20 years old. However, Abdel-Azeem (2021) reported no significant association between age and temperament.

2.2.3 Breed

Hausberger and Muller (2002) showed that breed can affect a horse's reactions toward humans. Arabian, thoroughbreds, saddlebreds, and walking horses are the most nervous while Quarter Horses and Paints, Appaloosas, and Drafts are the least nervous (Sackman & Houpt, 2019). Another study by Lloyd et al. (2008) indicated that thoroughbreds, arabian, and Welsh cobs are highly associated with excitable or anxious traits, whereas Irish Draught and Highland ponies exhibited weak association. Sociability and inquisitiveness were also assessed and were the highest in Arabian and Thoroughbreds and lowest in Irish Draught Horses and American Quarter Horses. This idea aligned with the demographic study by Watson et al. (2020), where American Quarter Horses, Paints, and other stock-type horses were grouped and accounted for the majority of equids used in the riding therapy programme.

2.3 Horses Welfare Assessment

Animal welfare is a chronic state that reflects an animal's subjective perception of its situation and living conditions (Lesimple, 2020). Hausberger et al. (2020) state that since welfare is the animal's subjective experience, the welfare status needs to be evaluated using objective assessment tools.

Based on Nevala (2023), several valid positive welfare indicators for the horse welfare assessments include the horse's natural living conditions, human-horse relationships, cognition, and social bond analysis. Findings also suggest that behavioural indicators are invalid and physiological parameters lack validation. These two signal types belonged to non-valid positive welfare indicators. Example for the physiological parameters are heart rate and hormonal assay (Lesimple, 2020). It reflects a temporary state, which is invalid when measuring animal welfare.

Based on Lesimple (2020), acute or chronic disorders are among health-related indicators that can be considered when assessing animal welfare. However, determination of the degree of accurate chronicity is crucial as acute diseases cannot be considered a reliable welfare indicator, as they might reflect temporary discomfort. For example, lameness is related to acute pain or discomfort and is not chronic welfare. In addition, coughing or discharges from ocular, nasal, or genitals are other examples of health-related indicators that are likely to occur in both acute and chronic situations. Even though some of the health-related indicators may be related to temporary states, these indicators may be used as a predictor of potential welfare issues and hence warrant thorough inspection of the animal.

2.4 Common Medical Conditions in Riding Therapy Horses

Watson et al. (2020) demonstrated that limb lameness and back soreness were the top health issues noted, with only a small percentage of colic and ulcers reported in riding therapy horses. This is supported by another study by Ballou et al. (2020) whereby 68.8% of horses greater than 20 years of age were affected with chronic health conditions, with osteoarthritis (42.4%), pituitary pars intermedia dysfunction (26.8%), dental disease (15.1%) and ophthalmic disease (11.1%) among the most common conditions reported. The majority of the horses involved in these studies were geriatric horses that are more than 16 years of age.

2.5 Common Treatments in Riding Therapy Horses

According to Watson et al. (2020), the most common supplement or treatment received by riding therapy horses include nonsteroidal anti-inflammatory drugs (NSAIDs) for a lameness issue, chiropractic adjustment, and massage. In addition, Van Weeren and Back (2016) stated that immediate medical treatment of flare-ups, long-term pain management, and adaptation of exercise and living conditions are the mainstays of treatment for geriatric horses with musculoskeletal disease.

CHAPTER 3
MATERIALS AND METHODS

This study was carried out on a total of 12 horses used for riding therapy in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu (Animal Care and Use Ethics Approval: UPM/IACUC/AUP-U026/2023). The study consists of a questionnaire distributed to stable managers and a physical examination of therapy horses in the same premise. The Spearman Correlation test was performed to find associations between the response gathered and physical examination findings. Consent was given by the premise owners before the commencement of the study. The Department of Veterinary Services Malaysia Animal Welfare Codes of Practices (COPs); Horse Riding and Spelling Activities guideline of accepted standard care was used as a reference.

3.1 Survey Form

The questionnaires (Appendix A) were divided into three sections: equine demographic (n=3 questions), general programme (n=6 questions), and equine health and care (n=8 questions). The 17-item questions were adapted and modified from a validated survey on horse use in therapeutic riding in the United States (Watson et al., 2020). The target respondents are stable managers at two riding therapy operation centers under RDA Malaysia in Selangor and Terengganu.

3.2 Physical Examination

Systemic physical examination of the horse at rest was performed using a monitoring sheet (Appendix B) which includes assessment of the vital signs (i.e., temperature, respiratory rate, heart rate, mucous membrane health, capillary refill time, gut sound, dehydration status including the lung sound), and musculoskeletal (i.e., walk and trot in a straight line) system (Khairuddin et al., 2019). The inclusion criteria are riding therapy horses at various equestrian establishments under RDA Malaysia.

3.3 Data Analysis

The data collected were tabulated in Microsoft Excel and analyzed using IBM SPSS Static Version 27. The normal distribution was tested using Shapiro-Wilk's test, and due to data non-normality, Spearman's Rank Correlation was used to determine the association between survey response data and physical examination findings. Significance was declared at $P<0.05$. Numeric data were treated as ordinal, and non-numeric data were treated as categorical for the purpose of analysis.

CHAPTER 4
RESULTS AND DICUSSION

4.1 Equine Demographics

This study showed that there is no usage of stallions, and there is an equal number of mares (50%) and geldings (50%) used for the riding therapy programme (Figure 4.1A). The absence of male horses for the programme may be due to their aggressive behaviour aside from being difficult to work with when they reach sexual maturity (O'Brien, 2014), rendering them unsuitable to be used by children for the riding therapy programme. Mares and geldings however, showed no significant behavioural differences when ridden (Aune et al., 2020) and are therefore deemed more suitable for this purpose.

Most horses that are used for riding therapy (61.5%) are more than 20 years old (Figure 4.1B). Older horses tend to be more even-tempered when compared to younger horses (Anderson et al., 1999), which made them more preferable to be used by children for the riding therapy programme. Based on the DVS Malaysia guideline, horses under three years of age (except for two years old thoroughbred) must not be used for work in riding centers to reduce the risk of injury and growth abnormalities, especially when there is heavy work involvement. Thus, the present data reflects that the age range of horses used for this programme was appropriate and according to the guideline-recommended.

In this study, ponies accounted for 50% of equids used in the programme (Figure 4.1C). A pony is suitable to be ridden by children or those who fear horses (Salem, 2023). However, ponies have a reputation for being stubborn and feisty. If a calm demeanour is preferable in equid selection than size for the programme, choosing a horse belonging to a least nervous breed is deemed more appropriate.

Half of the horses used for riding therapy (50%) undergo light exercise as training (Figure 4.1D). Aged horses often have reduced maximum heart rate that can cause quick exhaustion when under high-intensity workouts (McKeever, 2003). Additionally, it is crucial to have continuous light exercise all year round with no extended period off to keep the older horses

in the right tone and weight, in addition to warding off a rapid decline in horse discomfort and mobility. Based on the DVS Malaysia guideline, each horse should be given one full day of complete rest after six days of work. Thus, the current practice reflects the appropriate training of horses for the programme. Figure 4.1E shows the training type and its frequency per week.

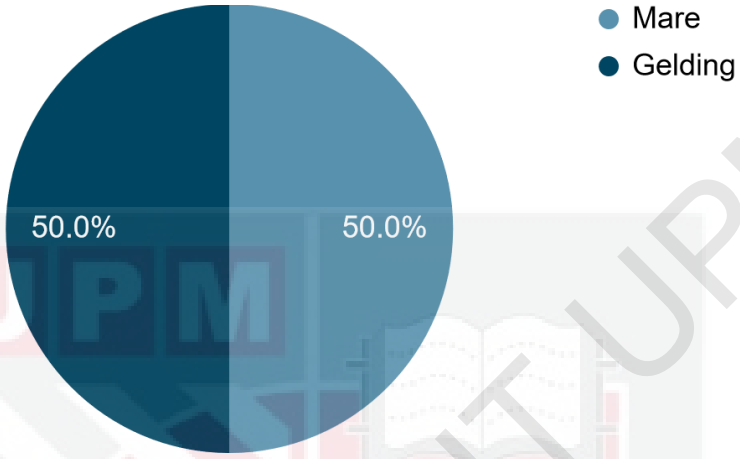

Figure 4.1A Gender distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

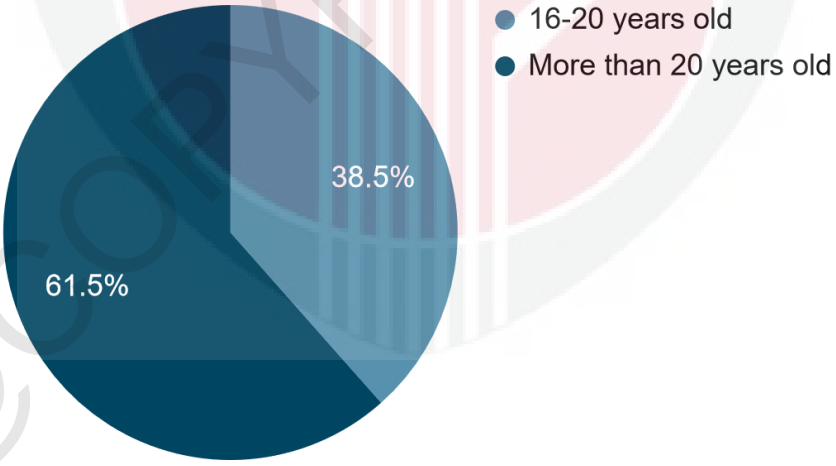

Figure 4.1B Age distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

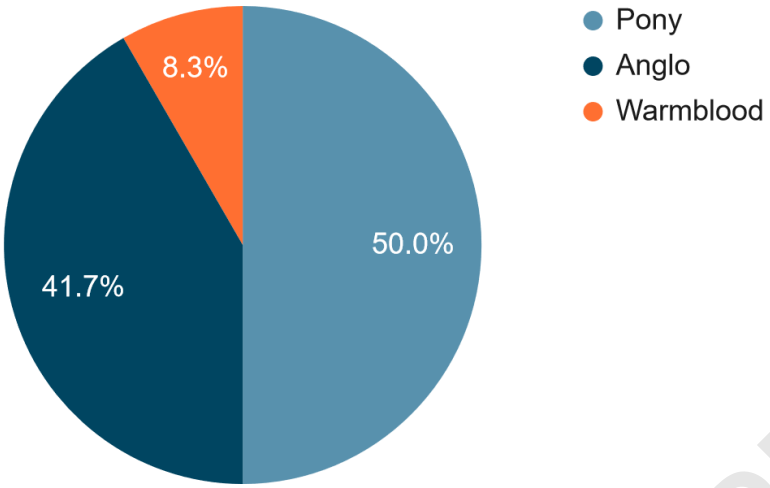

Figure 4.1C Breed distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

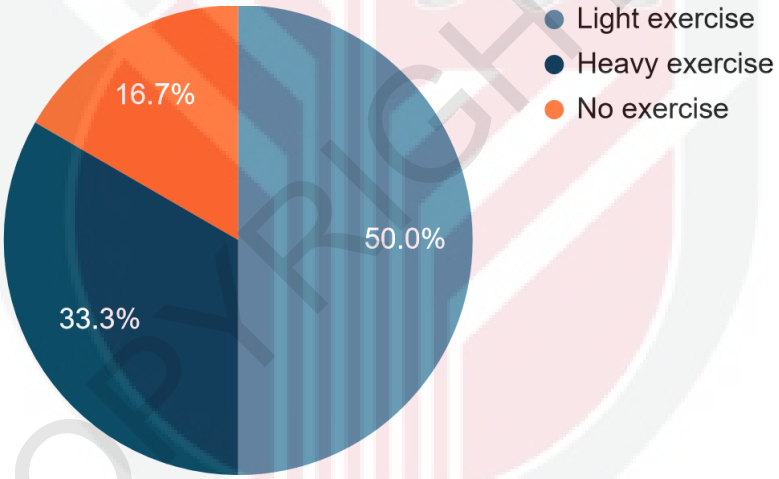

Figure 1.1D Training distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

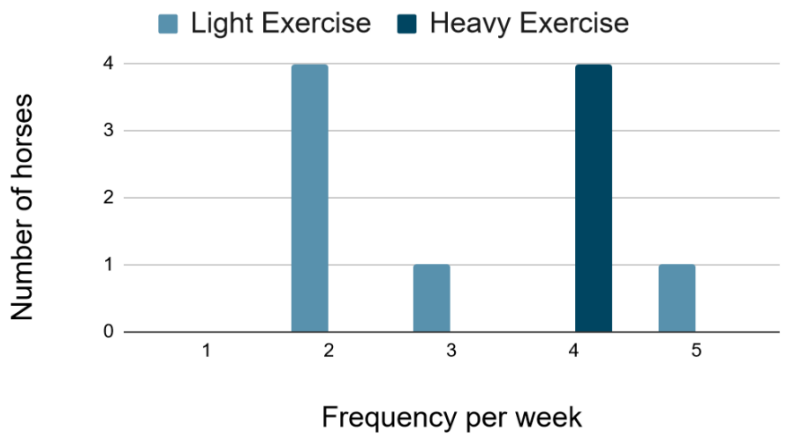

Figure 4.1E Training distribution of riding therapy horses according to training frequency per week

4.2 General Programme

There is an equal distribution for programme frequency between once per week and three times per week (Figure 4.2A). Horses were ridden for an average of 40 minutes per session. Based on the DVS Malaysia guideline, each horse should be given one full day of complete rest after six days of work, and no horses are to be used for more than four continuous hours with a minimum of 30 minutes rest in between. Thus, the current practice reflects the appropriate usage of horses for the riding therapy programme.

Horses remained in the programme for approximately seven years. The period of horses remaining in the programme was considered a short period. Most horses had a first career before becoming therapy animals, making them older in a second career (Watson et al., 2020). Therefore, the duration spent by the horses in the riding therapy programme is considered as short as the typical lifespan of horses is between 25 and 30 years old.

The most common acquisition mode of horses (66.7%) for the riding therapy programme was through donation (Figure 4.2B). Lack of funds in the programme can be one of the reasons why non-profit organizations rely on donations and fundraisers (Watson et al., 2020).

Misbehaviour was the common reason (50%) to exclude potential or current horses from the programme (Figure 4.2C). However, unsoundness and behaviour are intricately

interconnected (Dyson et al., 2018). Without accurate diagnostic work, horses may be classified as being retired because of underlying unsoundness or health issue that manifested themselves as a change in behaviour. Thus, behaviour, soundness, and health emerged as crucial factors in selecting or retiring horses (Rankins et al., 2021).

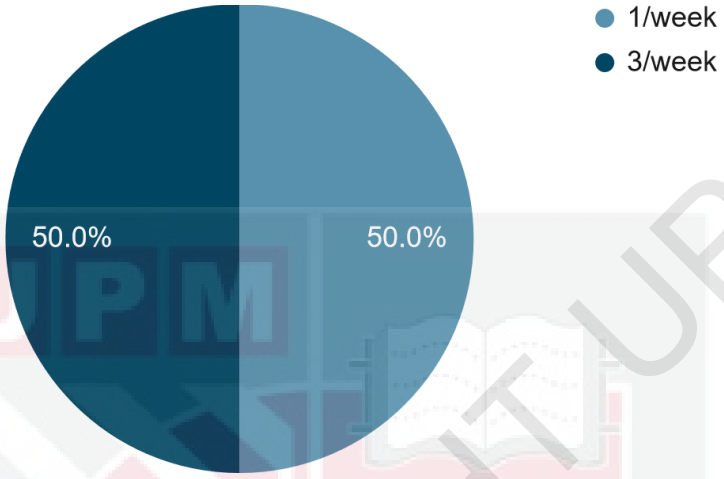

Figure 4.2A Programme frequency distribution in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

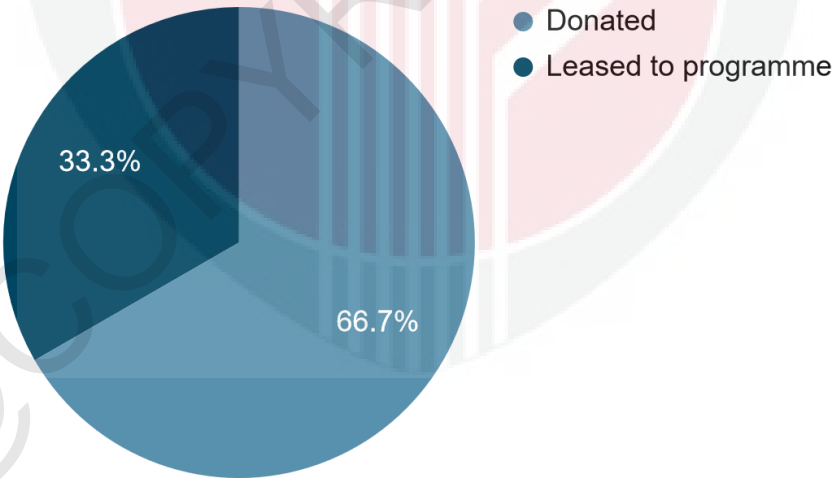

Figure 4.2B Acquisition distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

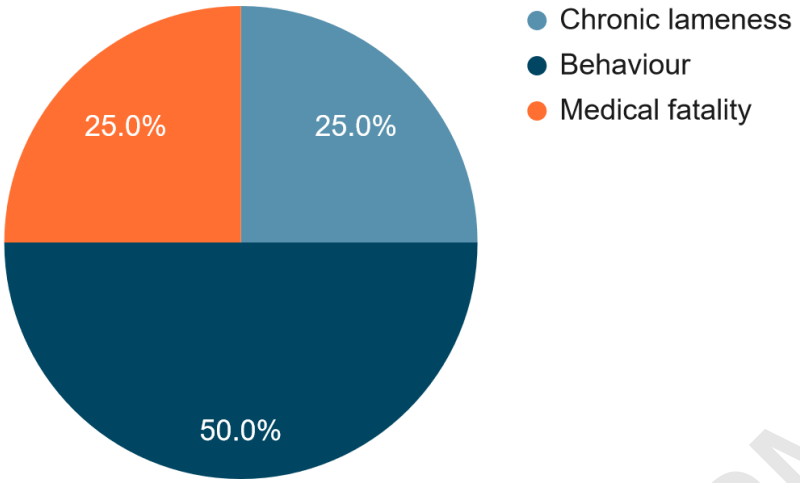

Figure 4.2C Distribution of exclusion reason of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

4.3 Equine Health and Care

In this study, 66.7% were shoed (Figure 4.3A), and 80% of the shoed horses had complete shoeing (Figure 4.3B). The findings reflected high awareness regarding the importance of shoeing among stable managers. However, some horses were most likely left barefooted due to low exercise volume relative to horse performance and to reduce cost (Watson et al., 2020). Based on DVS Malaysia guidelines, horseshoes should be inspected at least every six weeks for replacement or adjustment. Thus, the current practice reflects appropriate horseshoe placement frequency for horses used in the riding therapy programme.

As expected, horses experienced a higher incidence (42.9%) of limb lameness (Figure 4.3C), as most of the horses involved in the riding therapy programme are aged horses. According to Fürst et al. (2008), the number of trabeculae decreased significantly, and the distance between trabeculae increased significantly with aging. The age-related changes in the bones may explain the higher incidence of fractures and fissures in older horses, which can be one of the reasons for lameness in horses. The other common reason for a horse to succumb to lameness is pain stemming from musculoskeletal systems, including muscles, tendons, ligaments, and joints.

The most common treatment given was NSAIDs (57.2%), shown in Figure 4.3D. Most NSAIDs are relatively inexpensive and frequently the first line of medication used to relieve pain and reduce inflammation (Witstein, 2023). However, continuous treatment of NSAIDs can be detrimental due to the induction of gastric ulceration (Sykes et al., 2015).

A horse's ability to work is assessed visually before the riding therapy session (Watson et al., 2020). In the current study, the horses were most often checked daily by the staff (66.7%)(Figure 4.3E). Based on the DVS Malaysia guidelines, aged and geriatric horses should be assessed by a registered veterinary practitioner/ person experienced in general health and be given complete dental examination and treatment every 12 months. Thus, the current practice did not adhere to the recommended health evaluation of horses used in the riding therapy programme.

There is an equal distribution of housing between horses housed in stalls only and horses housed in stalls and dry lots (Figure 4.3F). Stable managers may refuse to include placement of horses at dry lot due to possible risk of injury. However, it is recommended to release sport horses for free movement in paddocks when the welfare conditions improved (Lesimple et al., 2020) and to reduce the risk of colic. According to Cohen et al. (1999), horses stalled more than 50% of the time are at risk compared to horses that have pasture turnout more than 50% of the time.

All respondents agreed that routine physical examination is crucial, are aware of animal welfare codes of practice created by DVS Malaysia, and considered the feeding regime as important contributing factor in the best management practice for the premises.

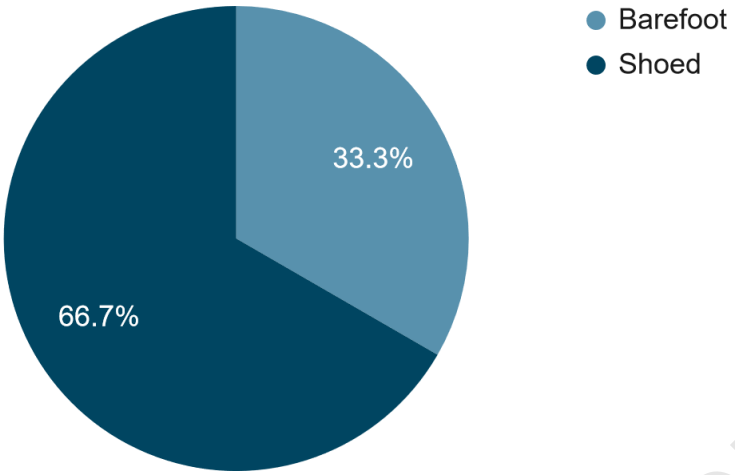

Figure 4.3A Shoeing programme distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

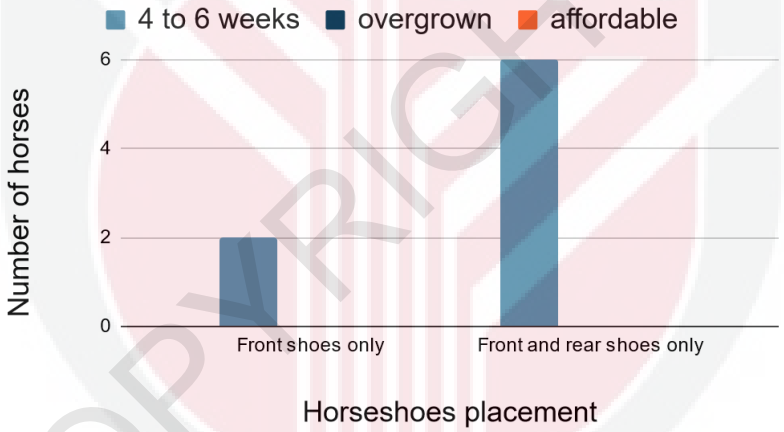

Figure 4.3B Horseshoes placement of riding therapy horses based on horseshoeing change frequency

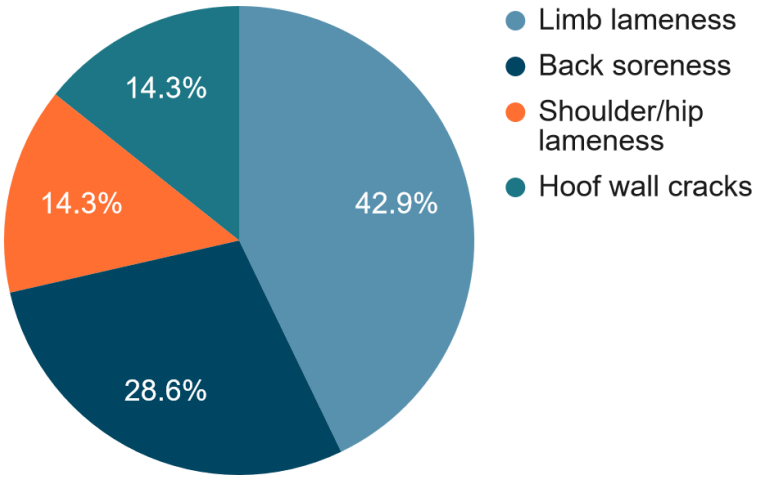

Figure 4.3C Medical condition distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

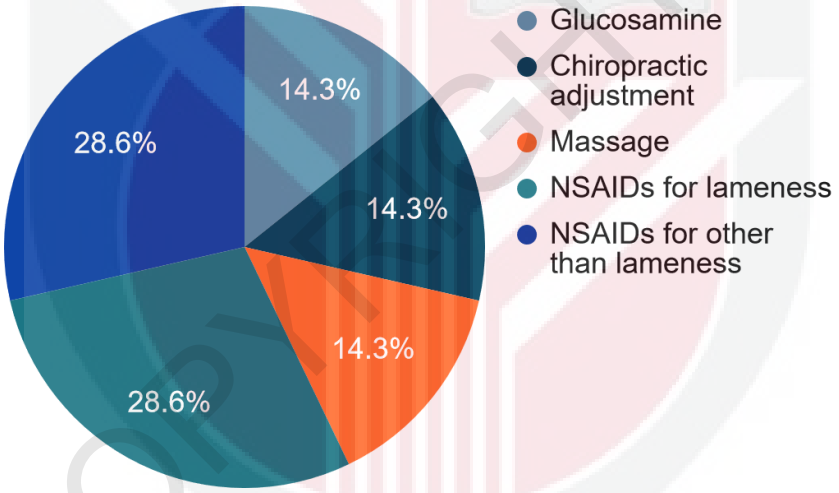

Figure 4.3D Treatment distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

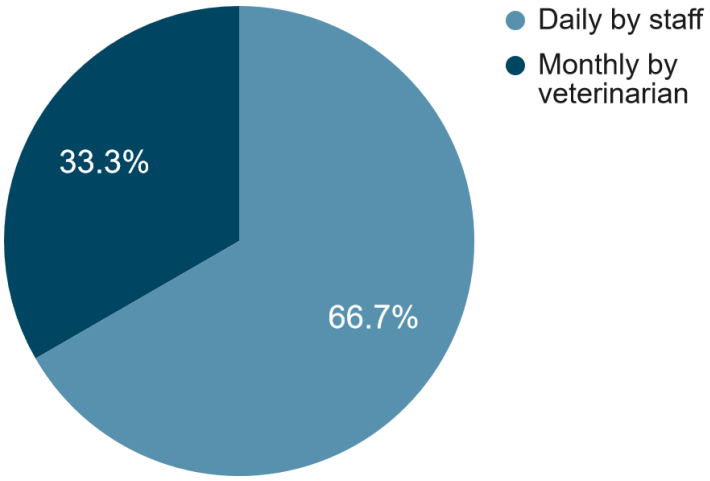

Figure 4.3E Health evaluation distribution in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

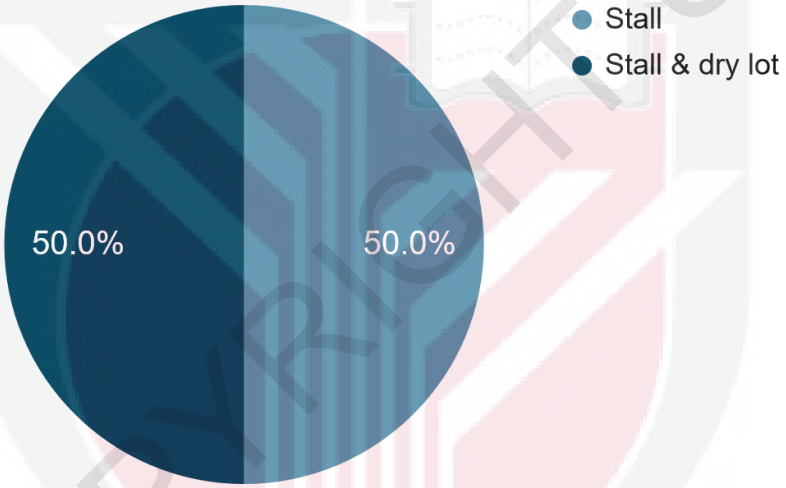

Figure 4.3F Housing distribution in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

4.4 Physical Examination

The majority of the horses (66.7%) are not healthy (Figure 4.4A), and the most common disease encountered is related to the musculoskeletal system (53.8%) and the gastrointestinal system (23.1%) (Figure 4.4B). Further diagnostic work was not carried out in this study to determine the cause of abnormalities in the horses.

Thal (2016) stated that an appropriate general lameness exam include history taking, physical examination (standing & in movement), flexion and hoof tester examinations, diagnostic anaesthesia (nerve & joint blocks), and imaging the site of injury (e.g., radiographs, ultrasound

and Magnetic Resonance Imaging). In the present study, lameness was the most common type of musculoskeletal system abnormalities in all of the horses. The majority of the horses have grade 2 lameness (42.8%), followed by grade 3 (28.6%) and grade 4 (28.6%) lameness. The findings are consistent to those by Watson et al. (2020), who reported that limb lameness and back soreness were the top health issues noted in riding therapy horses. The findings are concurrent with the changes in bone anatomy in aged horses (Fürst et al., 2008).

According to Koenig and Cote (2006), the complex interaction between neural, hormonal, vascular, and neuromuscular pathways influenced gastrointestinal propulsive motility. The abnormalities in the gastrointestinal system depend on the motility factor, which can be divided into no motility, hypomotility, and hypermotility. Hypomotility in horses can occur in cases of equine grass sickness, gastroduodenal ulceration, colic (e.g., obstruction, impaction, excessive wall distention, strangulation obstruction), inflammation of various regions of the gastrointestinal tract like peritonitis, duodenitis, proximal jejunitis, and colitis (Sanchez, 2009), which can be determined by history taking, medical record, physical examination, rectal palpation, nasogastric intubation, abdominocentesis, ultrasonography, complete blood count test, and biochemical blood test (Rice, 2022).

On the other hand, hypermotility in horses is commonly associated with spasmodic colic that can occur secondarily to worms, deworming, excitement, stress, unusual physical activity, dietary changes, and the drinking of large amounts of cold water, especially after exercise (Paxter et al., 2023), which can be determined by history taking, medical record, physical examination, and biochemical blood test (Rice, 2023).

In this study, 33.3 % of the horses with abnormal gastrointestinal systems had hypomotility, and 66.7% had hypermotility. However, the exact causal factors for these conditions were not delved into further.

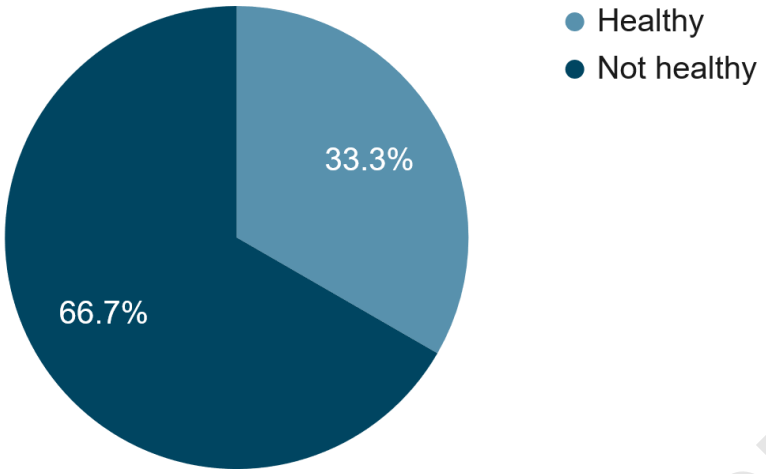

Figure 4.4A Physical examination distribution of the riding therapy horse population in two different riding therapy operation centers under RDA Malaysia located in Selangor and Terengganu

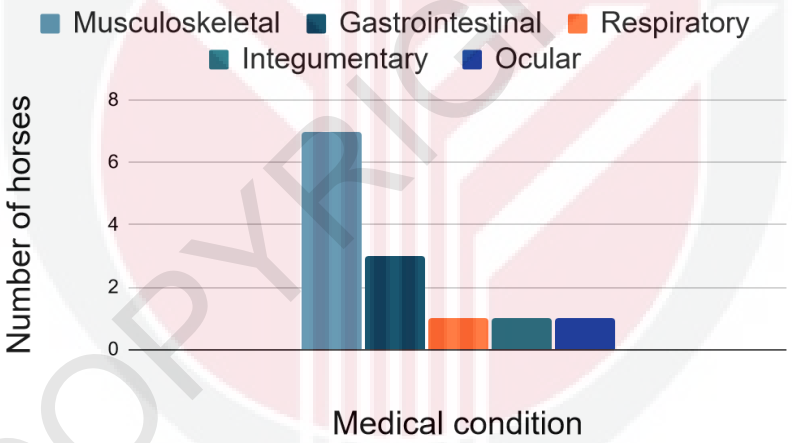

Figure 4.4B Medical condition distribution of riding therapy horses according to body systems

4.5 Association between Survey Form Data and Physical Examination Findings

The association between the percentage of sick horses to the gender, age, breed, work type, programme frequency, session duration, and shoeing programme was performed using the Spearman Correlation Rank analysis. However, the results from the analysis were not significant (P>0.05) because of the small sample size (Table 4.5).

Table 4.5 Relationship between survey form data and physical examination findings using Spearman's Rank Correlation test of the riding therapy horse population

Relationship	Sig. (2-tailed)	Correlation Coefficient
Age to % of sick horses	0.624	0.158
Breed to % of sick horses	0.421	0.256
Gender to % of sick horses	0.260	0.354
Work type to % of sick horses	0.433	-0.250
Programme frequency to % of sick horses	0.098	-0.500
Session duration to % of sick horses	0.098	0.500
Shoeing frequency to % of sick horses	0.098	-0.500

CHAPTER 5
CONCLUSION

5.1 Summary

Based on the data gathered in this study, it can be concluded that riding therapy horses were used appropriately based on age and breed, are not overworked, had proper shoeing programme, did not receive adequate professional health evaluation, and had minor degrees of ailments & being used for other types of work in the riding centers. The findings reflect positively on the horse use and care in this programme. However, a pre-acquisition health examination by a veterinarian and a trial assessment period of the horses that will be used for the riding therapy programme should be considered because not all horses have the capabilities or are suitable to be therapy-assisted animals. In the long term, this practice will assure that the horses selected are fit for the programme according to the recommended welfare standards aside form maximizing the benefits to its riders.

5.2 Recommendation

It is recommended that the sample size of the study be increased to fit the criteria for appropriate statistical analysis. The timelines of the study need to be negotiated and agreed upon by all parties in order to achieve the milestones set and adequate sample size for valid analyses. Lastly, the scope of the study can be expanded by including an evaluation of other reliable and valid welfare indicators.

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APPENDIX A

QUESTIONNAIRE

SURVEY ON EQUINE DEMOGRAPHIC, GENERAL PROGRAMME, AND EQUINE HEALTH & CARE OF THE HORSES USED FOR RIDING THERAPY

VPD 4999 Final Year Project

Demographic Study and Health Status of Horses Used for Riding Therapy in Malaysia

This study aims to gather data regarding horse use and care in riding therapy as a preliminary step towards standard care foundation. The outcome of this study can help those involved in the equine industry to review best management practice to ensure these support healthy horses.

Name of RDA Branch: _____

Equine Demographics

1. How many horse(s) are in riding therapy programme?

_____

2. What is the number of horse(s) for each category below?

		Number of horse(s)
Gender	Mare	
	Gelding	
	Stallion	
Breed	Thoroughbred	
	Warmblood	
	Other (Please state):	
Age	Less than 5 years	
	6 to 10 years	
	11 to 15 years	
	16 to 20 years	
	More than 20 years	

3. What is the frequency of training for the horse(s)?

Training programme	Frequency	Number of horse(s)
Lunging □ Yes □ No	□ Once a week □ Twice a week □ Other (Please state):	
Light exercise □ Ridden □ Not ridden	□ Once a week □ Twice a week □ Three times a week □ Other (Please state):	
Heavy exercise (riding school) □ Yes □ No	□ Five times a week □ Six times a week □ Seven times a week □ Other (Please state):	
Other (Please state):		

General Programme Questions

4. What is the regime of programme?

□ Once a week
□ Twice a week
□ Three times a week
□ Four times a week
□ Other (Please state): _____

5. What is the duration of each session?

□ 20 minutes
□ 30 minutes
□ 40 minutes
□ 45 minutes
□ Other (Please state): _____

6. What is the number of horse(s) acquired through the method below?

Acquisition	Number of horse(s)
Purchased	
Donated	
Leased to programme	
Other (Please state):	

7. How many years do horse(s) remain in the programme on average?

_____

8. What is the most common reason horse(s) are excluded from the programme?

- Chronic lameness
- Suitability of personality or behaviour
- Aging
- Fatality:
  - Medical (Deaths resulting from disease related)
  - Trauma (Deaths resulting from bodily harm that can be caused by sharp objects and more)
- Other (Please state): _____

9. What is the number of riders for each medical conditions below?

Medical condition	Number of rider(s)
Autism spectrum disorder	
Cerebral palsy	
Down syndrome	
Other (Please state):	

Equine Health and Care

10. What is the frequency of horseshoeing programme?

Shoeing programme	Frequency	Number of horse(s)
Barefoot - Yes - No		
Front shoes only	- 4 to 6 weeks - When have overgrown long hooves - When affordable - Other (Please state):	
Front and rear shoes	- 4 to 6 weeks - When have overgrown long hooves - When affordable - Other (Please state):	

11. What is the number of horse(s) with medical conditions encountered for the past year, if any?

Medical condition	Number of horse(s)	Gender	Breed	Age (years)	Work type (single/multipurpose)
Limb lameness					
Back soreness					
Shoulder or hip lameness					
Ulcers					
Colic					
Hoof abscess					
Hoof wall cracks					
Other (Please state):					

12. Did the horse(s) receive the following treatment in the past year?

Treatment	Yes	No
Glucosamine		
Joint injections		
Chiropractic adjustment		
Massage		
NSAIDS for lameness		
NSAIDS for reasons other than lameness		
Other (Please state):		

13. How often are health evaluations of horses conducted by staff and/ or veterinarians? Check all that apply.

- ☐ Daily by staff
- ☐ Weekly by staff
- ☐ Monthly by veterinarian
- ☐ Once per year by veterinarian
- ☐ Twice per year by veterinarian
- ☐ Other (Please state): _____

14. How are horse(s) primarily housed when not working?

- ☐ Stall
- ☐ Dry lot (dirt paddock with no grass)
- ☐ Small paddock (with some grazing)
- ☐ Pasture (with significant grazing)
- ☐ Other (Please state): _____

15. Routine physical examination for horses is crucial to ensure their good health and wellbeing.

☐ Yes
☐ No

16. Are you aware of standard care guideline made by Department of Veterinary Services Malaysia which is the Animal Welfare Codes of Practices (COPs); Horse Riding and Spelling Activities?

☐ Yes
☐ No (Please state what guideline you are using): _____

17. What is the definition of best management practice regarding horse use and care in riding therapy programme?

_____
_____
_____

END OF QUESTIONS

APPENDIX B

MONITORING SHEET FOR PHYSICAL EXAMINATION OF THE HORSES USED FOR RIDING THERAPY

Project title: Demographic study and health status of horses used for riding therapy	Approval AUP no.: U025/2023
PI:	Phone number/ email:
Research/ person in charge:	Species/breed/sex/age:
Date of experimentation: 17/07/2023-17/09/2023	Date:
Procedure: Physical examination	RDA branch name:

Animal ID		
GENERAL APPEARANCES		
Mentation Normal (BAR/QAR) =0 Depressed or lethargic=1 Obtund=2 Stuporous=3 Comatose=4		
Body condition score Poor=1 Very thin=2 Thin=3 Moderately thin=4 Moderate=5 Moderately fleshy=6 Fleshy=7 Fat=8 Extremely fat=9		
TEMPERATURE Normal=0 Hypothermia=1 Hyperthermia=2		
HEART RATE Normal=0 Bradycardia=1 Tachycardia=2		
RESPIRATORY RATE Normal = 0 Bradypnea = 1 Tachypnoea=2		

GUT SOUND Normal=0 No motility=1 Hypomotility=2 Hypermotility=3		
MUCOUS MEMBRANE Normal=0 Pallor=1 Congestion=2 Cyanotic=3		
CAPILLARY REFILL TIME Normal=0 More than 2 seconds=1		
SKIN TENT Normal=0 More than 2 seconds=1		
LUNG SOUND Normal=0 Crackles=1 Harsh=2 Wheezes=3		
LAMENESS Lameness not perceptible under any circumstances=0 Lameness is difficult to observe and is not consistently apparent regardless of circumstances=1 Lameness is difficult to observe at a walk or when trotting in a straight line but consistently apparent under circumstances=2 Lameness is consistently observable at a trot under all circumstances=3 Lameness is obvious at a walk=4 Lameness produces minimal weight bearing in motion and/or a complete inability to move=5		
OTHER COMMENTS		
MONITORED BY/INITIAL		