



Research Article

Assessment of Welfare and Health Conditions on Working Donkeys in Benadir Region, Somalia

Yonis Abukar Mohamed¹, Shafi Abdullahi Mohamed^{1,2}, Abdiaziz Idiris Mohamud^{1,3*}, Abdiaziz Ahmed Mohamud^{1,3}, Kassim Abdullahi Jimale^{1,2} and Said Ali Ibrahim²

¹Somali Animal Welfare Society (SAWS), Mogadishu, Somalia; ²Faculty of Veterinary Medicine and Animal Husbandry, Somali National University, Mogadishu, Somalia; ³Department of Medicine, Faculty of Veterinary Science, Bangladesh Agricultural University Mymensingh-2202.

Abstract | A cross-sectional study was conducted from June to October 2021 with the objectives to perform an animal welfare assessment and to gain adequate knowledge of the management of working donkeys in Somalia. Both direct observational (animal-based) and indirect (owner-based) interviews were used to collect the data. A total of 350 randomly selected working donkeys were examined and 350 donkey owners were interviewed. Of these 56.9%, 24.3%, 18.9%, 79.7%, 65.4%, and 38.3%, 8.9% of donkeys were suffering from behavioral problems such as depression, digestive problems, respiratory problems, improper harnessing, ocular, hoof overgrowth and fracture, respectively. Additionally, 40.6% of the examined donkeys had varying degrees of lameness. 54.6% of the examined donkeys, were with either healed or active wounds (skin lesions), 17.4% scars, and 28.0% both skin lesions and scars. Moreover, dermatological diseases were also encountered, habronemiasis 59.1%, ectoparasite 35.7%, Sarcoïd 5.1%. Results that were obtained from the indirect assessment of donkeys' welfare indicated that most donkey owners in the region have little or no knowledge and information on donkey's welfare matters. Limitation of taking sick donkeys to veterinary clinics 2.0% abandon of donkeys after stopped working 96.6%, lack trimming hooves of donkeys 78.9%, and beating of donkeys 79.7%. Donkeys are beneficial to most owners, interventions should be put in place to improve their welfare and further studies were done on the best ways to improve the welfare issues faced by these working animals.

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***Correspondence** | Abdiaziz Idiris Mohamud, Somali Animal Welfare Society (SAWS), Mogadishu, Somalia; **Email:** dr.idiriis@gmail.com

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Introduction

The donkey (*Equus asinus*) is the first member of the Equidae family to be domesticated (Rossel *et al.*, 2008). Most people living in poor communities' benefit from these working animals. Most donkeys are usually infected by diseases and may develop very serious health issues due to their poor living

conditions, poor management, and the tough work requirements. The world donkey population is estimated about 44 million; half is found in Asia, just over one quarter in Africa, and the rest mainly in Latin America (Fernando and Starkey, 2004).

Donkeys are used by most people to carry luggage and pull heavy carts making them essential. Recently

there is an increase in the use of animals such as mules and donkeys for transportation in many communities. They are capable to tolerate temperatures even higher than 48 to 50°C in summer in some areas of the country (Hameed *et al.*, 2016).

The increasing human population demands for transport of goods to and from far, remote areas, and construction activities around towns are making donkeys very essential and beneficial (Biffa and Woldemeskel, 2006).

In most developing countries, donkeys frequently get harness sores. This is mainly because most donkey owners adjust the harness to their own designs and make modifications without making an informed decision on the applied principles of traction. Additionally, some people do not know how each part of the harness work hence making the situation worse. Using an inappropriate design of poorly fitting a harness to a donkey makes the animal uncomfortable, fatigued, and may have injuries (Hovell *et al.*, 1998).

A poor harness design is likely to cause breathing issues, prevent proper blood circulation and prevent the animal from moving freely. When an animal is harnessed using several hitches, the amount of energy the animal has will be less than the total amount of energy from various team components (Bobobee, 2007). Furthermore, studies conducted before having proven that some of the most common problems developed by donkeys that are harnessed poorly are development of deep lesions, swelling on joints, skin bruises, and even gut abnormality (Kumar *et al.*, 2014). Most donkey owners prefer to abandon their donkeys or leave them to die when they are unable to work or fall sick (Starkey, 1997). A study by Amante *et al.* (2014) from Ethiopia showed that 23.1% of the donkeys were depressed. In a study by Pritchard *et al.* (2005) 11.5% of the donkeys were described as apathetic or severely depressed, and when the observer approached the donkeys, 44.3% avoided the observer or showed signs of aggression and 43.6% did not show any response at all.

The beating of working donkeys is widespread, and the owners beat their donkeys when they perceive the animal as lazy. When a donkey is regularly beaten during work, it is likely to develop mental stress as well as physical wounds (Swann, 2006). Working donkeys that are owned by poor people have poor

welfare since their needs are not met. Although many people in Somalia benefit directly from donkeys without much input, they still do not take good care of the animal and consider it to have the lowest status compared to other animals (Biffa and Woldemeskel, 2006). The animals work under very harsh conditions with no suitable equipment and limited resources such as poor shelters, lack of enough food and do not get quality veterinary treatment services (Pritchard *et al.*, 2005). Working donkeys in Somalia are a source of livelihood for thousands of Somali communities, but they face many welfare problems including wounds, lameness, systemic infections, dehydration, and neglect in the allocation of resources such as feed, shelter, and equipment because they belong to the poor members of the community. Therefore, the objective of our study was to perform an animal welfare assessment and to gain adequate knowledge of the management of working donkeys in Somalia.

Materials and Methods

Study area

The study was conducted in the Benadir Region of Somalia Country lying on the latitude 2.046934 and longitude 45.318161. The study was done from June 2021 to October 2021. The region usually has normal yearly temperatures of 28.7°C - 37°C. Benadir region in Somalia has a population of approximately 2.3 million people and is Somalia's capital city. The area covered was about 96,878 km in total (Mohamud *et al.*, 2020, 2021).

Study design and study animals

The study selected donkeys included under packing animals using cross sectional design and random sampling techniques. Each member of the group acted as a representative for each district in the region. The welfare evaluation was done by interviewing randomly selected animals and families across the study area. Additionally, the results of this study were collected before interviewing the local area veterinarians. The study further used both direct and indirect research measurement methods in the assessment of the animals' welfare hence enabling the generation of enough information. Indirect methods were used to investigate management practices and the effectiveness of input hence the risks and welfare issues faced (Wood *et al.*, 2005), while direct methods used involved the use of animal-based parameters to establish the animals' welfare states (Pritchard *et al.*, 2005).

Direct assessment of working donkeys

Direct assessment data was collected by doing clinical evaluation and direct physical investigation of the animals. The factors used to determine the animal's health and welfare conditions include their age, gender, body condition, lameness observed, any sign of illness and demeanors.

Indirect welfare assessment of donkeys

Indirect assessment data on the animal's welfare was collected using semi-structured questionnaires. The data collected was then used to arrive at conclusions about the animal's welfare. The questionnaire was administered to 350 respondents (donkey owners).

Sample size determination

During the study period, donkeys of different peasant associations of the district were selected randomly and includes as part of the study. The study included a total of 350 donkeys which were selected depending on the overall; population of donkeys in a particular study area, (Thrufield, 2018) was used to calculate the sample size with 95% confidence interval (CI), 5% absolute precision (acceptable error) and 50% prevalence. The sample size determination was done using the formula.

$$N = \frac{(1.96)^2 \times (Pexp.)}{D^2}$$

Where; N= the required sample size; Pexp= expected prevalence (50%); D=desired absolute precision level of 95(0.05 confidence interval).

Data management and analysis

All the data have been entered in Microsoft Excel Spreadsheet-2019 and analysis was done. The analyzed data were reported in terms of percentages and frequency.

Results and Discussion

Result of indirect assessment

The face-to-face discussion was made by collecting the data and the participants were allowed to discuss the role of donkeys, management constraints, major health problems and the possible measures and solutions to be taken to improve the health status and welfare of working donkeys in the study area.

Frequency of respondents based on districts, sex, and level of occupation

The overall percentage of questionnaire respondents

from different districts of the Benadir region is shown in Figure 1. The highest percentage of the respondent was found in the Yaaqshiid district (42.9%, n=150) and the least was seen in the Karaan district, where the respondent percentage was 28% (n=98). The respondent was found only Male (100%; n=350), The highest percentage of age groups was found between 31-40 (46.9%, n=164). In terms of occupation level, the highest percentage of the respondent was found from both owner and employee (85.7%; n=300), followed by only owners (10.9%; n=38), and least was from only employed which was (3.4%; n=12). The overall details of the demographic characteristics of participants are presented in Table 1.

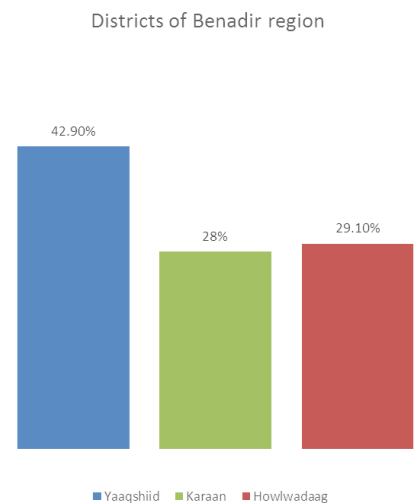


Figure 1: Different districts of the Benadir region.

Table 1: Demographic characteristics of participants.

Variables	Frequency	Percentage (%)
Gender		
Male	350	100%
Age		
15-20	30	8.5%
21-30	128	36.6%
31-40	164	46.9%
41+	28	8.0%
Education level		
Illiterate	5	1.4%
Primary	345	98.6%
Marital status		
Single	85	24.3%
Married	251	71.7%
Divorcee	14	4.0%
Occupational level		
Employed	12	3.4%
Owner	38	10.9%
Both	300	85.7%

Major roles of donkeys

The summarized result of the respondents included in the focus groups indicated that donkeys are exclusively used as pack animals in the study site mainly for transportation of building materials 30.0% (n=105) followed by transportation of water 21.4% (n=75), however, though very rarely, donkeys are also used to transport earning average transpiration of consumer goods 20.3% (n=71), and transpiration of firewood and charcoal 15.4% (n=54) and transpiration of animal feed 12.9% (n=45) of the proportion rated by the respondents (Table 2).

Table 2: The major role of donkeys in order of importance as perceived by the respondents.

Type of work of donkeys	Frequency	Percentage (%)
Transport of building materials	105	30.0%
Transport of water	75	21.4%
Transport of charcoals	54	15.4%
Transport of consumer goods	71	20.3%
Transport of animal feed	45	12.9%

General management conditions of donkeys

Among the respondents interviewed in the current study, most of them had no knowledge and information about donkey welfare. 81.7% (n=286) do not keep away their donkey from injury and diseases, while 18.3% (n=64) do care, Sick donkeys were treated mostly by buying medicine without vet doctors 58.0% (n=203), followed by giving traditional medicine 36.6% (n=128), only 2.0% (n=7) treated in veterinary clinics, and 3.4% (n=12) left them with untreated. Based on feeding, most participants 59.4% (n=208) feed enough for their donkey, 54.0% (n=189) feed separately and 46.0% (n=161) feed their donkey with other animals, while 40.6% (n=142) do not feed enough. In terms of beating donkeys, 79.7% (n=279) agreed that they beat their donkeys, while 20.3% (n=71) are denied. Regarding abandonment of donkey after stopped working only 3.4% (n=12) look after their donkey after stopped working. Most participants do not trim the hooves of their donkeys 78.9% (n=276), while 21.1% (n=74) trim the hooves of their donkeys. The overall details of the general management conditions of donkeys are presented in Table 3.

Direct assessment result

The results obtained from direct assessment in the current study indicated that working donkeys had

poor welfare management and health related problems such as wounds and lameness were common.

Table 3: General management conditions of donkeys.

Variables	Frequency	Percentage (%)
Do you keep away your donkey from injury and disease?		
No	286	81.7%
Yes	64	18.3%
How do you take care of your sick donkey?		
By buying medicine without vet doctors	203	58.0%
By giving traditional medicine	128	36.6%
veterinary clinics	7	2.0%
Left them with untreated	12	3.4%
Do you feed enough feed for your donkey?		
Yes	208	59.4%
No	142	40.6%
How do you feed and watering for your donkey?		
Separately	189	54.0%
with other animals	161	46.0%
do you beat your donkey?		
Yes	279	79.7%
No	71	20.3%
Do you abandon your donkey after stopped working?		
Yes	338	96.6%
No	12	3.4%
Do you trim hooves of your donkey?		
Yes	74	21.1%
No	276	78.9%

General health problems observed

The health status of the donkeys was assessed by examining each donkey. The highest examined donkeys were male 89.7% (n=314), and the highest age of examined donkeys was found between 6-8 years 54.0% (n=189). However, their health problems like a wound and lameness are not included in this portion. Hence, concerning health problems, a total of 350 of the examined donkeys were found to be with either healed or active wounds. The greatest distribution of the wound was found at the Skin lesion 54.6% (n=191) followed by Scar 17.4% (n=61), while 28.0% (n=98) found both skin lesions and scars. Regarding the types of dermatological Diseases, 59.1% (n=207) were found to habronemiasis, followed by Ectoparasite 35.7% (n=125), while the rest 5.1% (n=18) found Sarcoid respectively. The overall prevalence of problems related to musculoskeletal was observed 40.6% (n=142) lameness, followed by hoof

overgrowth, 38.3% (n=134), Abnormal gait 12.3% (n=43), and Fracture 8.9% (n=31). Eye problems were also observed, lacrimation 62.3% (n=218) and eye inflammation 3.1% (n=11) were also recorded. Around 56.9% (n=199) donkeys were observed to be depressed, while 24.3% (n=85), and 18.9% (n=66) were observed for digestive and respiratory problems. The overall prevalence of Harnessing conditions was observed in 79.7% (n=279) of donkeys was recorded (Table 4). General health problems were observed on the examined donkeys.

Table 4: General health problems observed on the examined donkeys.

Variables	Frequency	Percentage (%)
Sex of donkeys		
Male	314	89.7%
Female	36	10.3%
Age of Donkey		
2-5 years	36	10.3%
6-8 years	189	54.0%
more than 8 years	125	35.7%
Type of wounds		
Skin lesion	191	54.6%
Scar	61	17.4%
Both	98	28.0%
Dermatological Diseases		
Sarcoid	18	5.1%
Ectoparasite	125	35.7%
Habronemiasis	207	59.1%
Musculo-skeletal problem		
Lameness	142	40.6%
Abnormal gait	43	12.3
Fracture	31	8.9%
Hoof overgrowth	134	38.3%
Eye Conditions		
No eye conditions	121	34.6%
Lacrimation	218	62.3%
Eye inflammation (loss of one eye vision)	11	3.1%
Observation problems		
Depressed	199	56.9%
Digestive problem	85	24.3%
Respiratory problem	66	18.9%
Harnessing conditions		
improper harnessing	279	79.7%
insufficient/ no harnessed	71	20.3%

The current study has indicated that the donkeys in the study area had various health and welfare problems.

The prevalence of dermatological conditions such as ectoparasite, sarcoid, and habronemiasis was common among working donkeys in the study area. The overall prevalence of dermatological conditions was habronemiasis 59.1%, ectoparasite 35.7%, and 5.1 of sarcoid which is higher than the findings of Tesfaye *et al.* (2016) in Southern Ethiopia (25.8%), Sameeh *et al.* (2014) in Jordan (22.7%), and Ahmed *et al.* (2010) in Pakistan (11%). Lameness is the most economically important condition affecting the health of donkeys Broster *et al.* (2010). According to this study, approximately 40.6% of the donkeys showed prevalence of lameness. Pritchard *et al.* (2005) reported similarly that lame donkeys were relatively in poor body condition. Since donkey owners give less attention to the welfare and health care of donkeys than other animals lame donkeys were not provided with enough supplements of feed and water hence, their body condition might have been reduced. Lameness is one of the vital signs used as an indicator of welfare problems in working animals. The observed wounds on the animals were a major welfare concern since most of the animals get the wounds from extreme loading and poor harnessing. The overall prevalence of wounds in working donkeys in the present study was skin lesions 54.6%, Scar 17.4%, and both skin lesions and scars 28.0%, which was more than the 40% found in a study done in Ethiopia (Pearson *et al.*, 2002), additionally there was a higher prevalence as reported by Curran *et al.* (2005) in Ethiopia (79.4%) and Burn *et al.* (2008) in Jordan (59%). The occurrence of these types of wounds in donkeys was also reported in many studies (Pritchard *et al.*, 2005). According to Kumar *et al.* (2014), most of the wounds on donkeys are mainly because of overworking the animals, excess loading and poor harnessing. In our study in the improper harnessing, conditions were found 79.7%. Poorly designed and ill-fitted harnesses reduce the working efficiency due to discomfort and animals get fatigued (Pearson *et al.*, 2003). It was also reported by researchers that a donkey can get secondary infections from painful harness lesions making them incapable of working more and reducing their life expectancy (Smith, 2005). In most countries, wounds are among the main health issues that affect the working donkeys (Pritchard *et al.*, 2005; Biffa and Woldemeskel, 2006). Behavioral problems like depression in working donkeys were 56.9%. Beating donkeys is one of the major causes of behavioral problems. The result of beating a donkey is not only development of wounds and physical pain but also makes the animal have

mental issues such as stress and fear (Rushen *et al.*, 1999). According to most researchers, the donkeys may also develop behavioural issues (Burn *et al.*, 2010; Morka *et al.*, 2014; Kumar *et al.*, 2014). Morka *et al.* (2014) reported 23.1% in western Ethiopia, while Pritchard *et al.* (2005) reported 11.5% of the donkeys were depressed in their studies.

Results of the questionnaire survey indicated that most donkey owner have no information and knowledge on donkey's welfare management. Only approximately (2.0%) of sick donkeys received proper treatment from the veterinary clinics around. The findings of this study were lower than the 48.3% reported by Tesfaye *et al.* (2016), and Kumar *et al.* (2014) reported that 31.6% of the sick animals were taken to veterinary clinic for treatment. Most of the owner 58% of sick donkeys treated by buying medicine without vet doctors, 36.6% of sick donkeys were treated traditionally and 3.4 left them untreated, while the study of Kumar *et al.* (2014) reported that 10.5%, were treated traditionally and 57.9% did not get any help from their owner and forced to work regardless of the disease. Disease conditions are the major health problems that hinder the efficient utilization of donkeys. This might be because there are not enough veterinary services in Somalia. The present study disclosed that the main roles of donkeys forewarned by the respondents include transportation of building materials an average proportion of 30.0% followed by transportation of water (21.4%) and transportation of consumer goods (20.3%). This result agrees with the finding of Pearson (2000) who reported that the main importance of donkeys in different areas of Ethiopia was for transportation of different commodities. In the present study, it is observed that the main management constraints raised by owners were limitations of attitude towards donkeys. Lack of keeping away from the injury and diseases (81.7%) lack of trimming hooves (78.9%), lack of available enough feed (40.6%) and lack of taking care after stopped working (96.6%), lack of separated feeding and watering system (46.0%), and the beating of working donkeys in Mogadishu is very high (79.7%). This result is in line with the finding of Pearson (2000) who reported that negative attitudes towards donkeys (14%, 18%, 33%), unavailability of feed (69%, 34%, 74%), and unavailability of water (43%, 9%, 44%) in different Ethiopia, respectively. The main reasons that may have led to these results in Somalia include fact that most donkey owners pay less

attention to the animal, observe poor management practices and neglect the animal. Educating donkeys owners about the treatment of working donkeys would bring about better healing and less discomfort for the donkeys Mcpeak (2004). Furthermore, most of the families that own donkeys are generally poor and lack essential resources and financial means to help ensure that the donkeys are properly cared for (Pearson and Krecek, 2006).

Conclusions and Recommendations

Working donkeys in the study area experience multiple welfare and health problems, such as physical injury (wound), behavioral problems and diseases. The study also shows the lack of the owner's awareness towards nutrition and, a limited practice in taking sick donkeys to the clinic, providing enough feed and water, veterinary care, and welfare practices. The Donkeys are beneficial to most owners, interventions should be put in place to improve their welfare and further studies done on the best ways to improve the welfare issues faced by these working animals.

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Novelty Statement

The study presents the overview of the recent situation of knowledge, welfare, and general conditions of working donkeys, and as far we know this is the first time such a survey was done for donkey welfare in Mogadishu, Somali.

Limitations

The limitations we faced were time limitations and the sample size were small.

Author's Contribution

SAM: Design the study and collect data.

KAJ, SAI, and YAM: collect data and perform statistical analysis.

AIM, AAM and YAM: Prepare the draft, finalize the manuscript, and provide critical comments and review.

Conflict of interest

The authors have declared no conflict of interest.

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