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Wounds in Working Donkeys: Prevalence, Causes, and Risk Factors at Duna Woreda, Hadiya Zone, Ethiopia

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Abstract

A cross-sectional study was conducted between December 2017 and August 2018 and examines work-related wounds in working donkeys in the Duna woreda of Southern Ethiopia, focusing on prevalence, causes, types, and risk factors. Equines are essential for transportation in the area, but they face health issues due to improper management practices. Out of 384 randomly selected donkeys, the overall prevalence of wounds was 45%, with higher rates in males, older animals, and those in poor body condition. The most common wound locations were the prescapular region, back, hind limb, and neck. Improper harnessing and biting were major causes, and abrasions were the most frequent type of wound observed. These findings emphasize the need for improved management practices and better healthcare for working donkeys. This research provides insights into the prevalence, causes, types, and risk factors associated with work-related wounds in working donkeys. It highlights the importance of implementing appropriate management strategies and providing regular healthcare to reduce the occurrence of wounds and benefit the health and welfare of working donkeys.

Keywords: prevalence, risk factors, working donkeys, wounds

1. Introduction

The mammalian genus Equidae, which includes domestic and wild horses, donkeys, mules, and zebras, is one of the most important in the world. The importance of livestock is shown by the fact that many areas rely largely on animal muscle as their main source of energy. Beyond its contribution to nutrition, livestock's versatility offers a variety of tasks, particularly in underdeveloped countries, including traction and transport. The fact that so many facets of human existence and socioeconomic development rely on Equidae animals is a testament to their crucial contribution to these fields of study (FAO, 2006).

Equines are used for transportation in Ethiopia, but they suffer from diseases, weariness, dehydration, starvation, lesions, and hoof issues due to challenging terrain and inadequate equipment (Brooke, 2007). Donkeys in the region were often involved in multipurpose activities, such as transporting goods and pulling carts, for up to 12 hours a day (Biffa & Woldemeskel, 2006). Short initial working durations until the animal develops resistance were a management strategy used to prevent or lessen health issues related to employment (Behnke, 2011).

In order to improve the well-being of working donkeys, the implementation of an education and awareness program significantly reduced the prevalence of wounds in working donkeys from 59% to 11%. The program focused on training owners and handlers on proper harnessing techniques, recognizing signs of fatigue and distress in animals, and providing information on wound prevention and treatment. By enhancing the knowledge and skills of donkey owners, this initiative effectively reduced the occurrence of injuries and improved the overall well-being of working donkeys (Burn et al., 2007).

A multifaceted approach to address the welfare issues faced by working donkeys involved providing veterinary

care, education, and training to owners, as well as improving working conditions and access to water and shade. The holistic approach, which addressed both the health and welfare needs of the animals, proved success in improving their overall well-being (Rosales-Nieto et al., 2019).

Based on the findings of the study on wounds in working donkeys in Duna Woreda, Ethiopia, need for several policy implications and recommendations. Firstly, need for the development and implementation of education and awareness programs targeted at donkey handlers and owners. These programs should focus on promoting proper harnessing techniques, recognizing signs of fatigue and distress in animals, and providing information on wound prevention and treatment. By enhancing the knowledge and skills of donkey owners, it is possible to reduce the prevalence of wounds and improve the well-being of working donkeys.

Animals working hard surfaces should be shod if wounds are properly managed (rest and prevention of complications). The same harness should not be used for various drought-adapted animals (Guyo et al., 2015). Even though working equids play a crucial role in local economies and the overall economy, there aren't many research on their health. There are few studies on external injuries and most studies focus on the prevalence of infectious diseases. There hasn't been any research on the frequency, kinds, causes, and risk factors of wounds in working donkeys in the study area. Thus, the objectives of the study were:

- ✓ To determine the prevalence of wounds in working donkeys at Duna Woreda
- ✓ To identify the risk factors, causes, and the types of wounds in working donkeys in the study area.

2. Materials and Methods

2.1 Study Area

Across sectional study was conducted on randomly selected donkeys within and in the region of Duna Woreda, Hadiya Zone of Southern Ethiopia. Duna woreda is located at a distance of 274 km south of Addis Ababa and it is 42km from Hossana Town and lies at an altitude of 2030m above sea level. The mean annual temperature is 29.2^{o}C and with average annual rainfall is 1000 mm-1500 mm. The vegetation of the woreda is both natural and artificial man planted. The Agro-climate of the woreda is as follows woyinedega 35%, dega 54.8%, and kola 10.2%. The estimated livestock population of the woreda is 256,748 bovine, 30,385 equine, 58,961 caprine, 65,340 ovine, 6792 honey bee family, and 464,899 poultry (DWAOS, 2017).

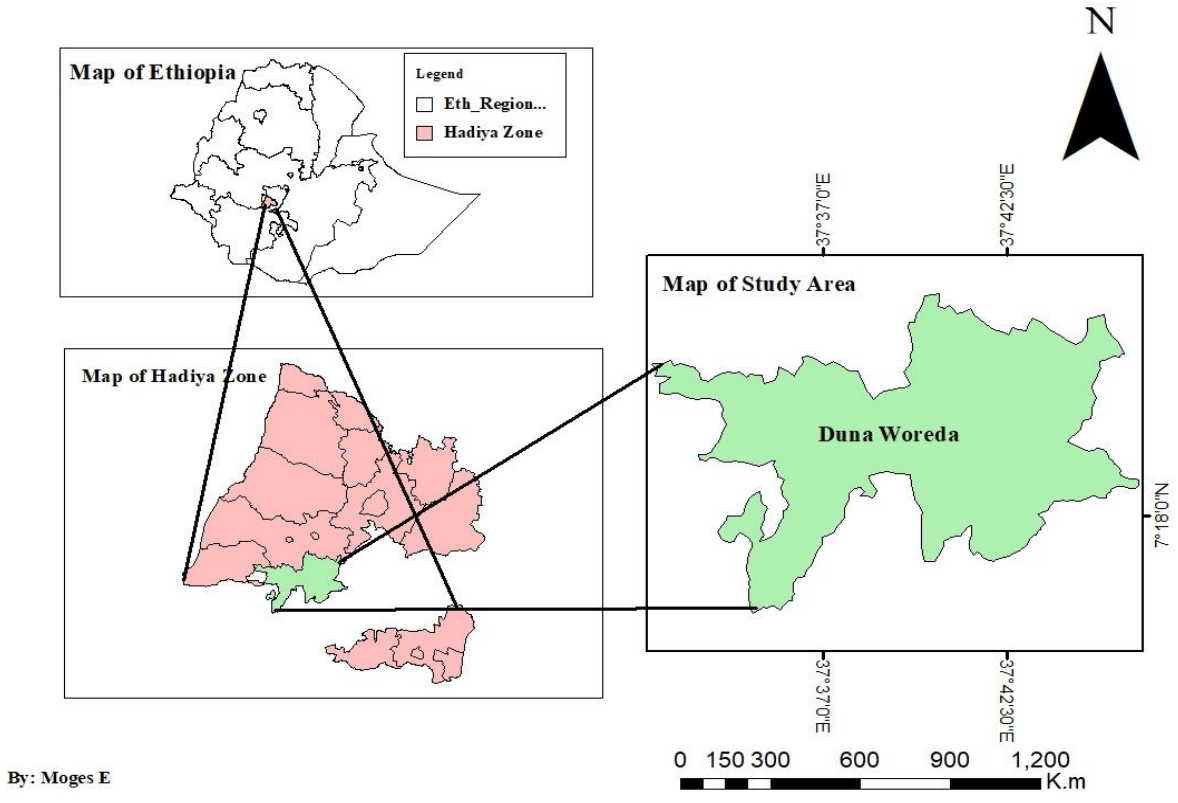

Figure 1. Map of Duna Woreda (Study Area) (Blate, 2023)

2.2 Study Animals

Donkeys from Duna Woreda in the Hadiya Zone were chosen at random to be the study's subjects. 384 donkeys in all, each with a different sex, age, and physical condition score, were used in the study. The donkeys' work-related wounds were managed differently.

2.3 Study Design and Sampling Techniques

This study assessed the prevalence, root causes, and potential causative factors to wounds in working donkeys in Duna Woreda, Hadiya Zone, Ethiopia. Data were collected from a representative sample of working donkeys in the research area using a cross-sectional study approach. Working donkeys from a variety of industries, such as agriculture, transportation, and construction, made up the research population. In Duna Woreda, Hadiya Zone, Ethiopia, a study was conducted to determine the prevalence, causes, and risk factors related to wounds in working donkeys. Data were collected from a representative sample of working donkeys in the research region using a cross-sectional study approach. Working donkeys from a variety of industries, such as agriculture, transportation, and construction, comprised the sample for the study.

2.4 Sample Size Determination

A multistage sampling technique was employed to select study animals, starting with Duna Woreda, followed by randomly selecting kebeles and households with working donkeys. The total sample size was determined using a precision and confidence interval formula given by Thrufield (2005) and although a total of 384 donkeys are intended to be sampled, in this study 387 donkeys were examined to maximize the precision.

$$N = \frac{1.96^2[pexpe(1 - Pexpe)]}{d^2}$$

Where N= sample size

P= expected prevalence

D= desired absolute precision

2.5 Data Management and Analysis

Through direct observation and well-organized interviews, the study collected data on the prevalence, causes, and types of wounds in working donkeys. Risk variables such as age, gender, workload, accessibility to veterinary care, and harnessing practices were evaluated using a standardized questionnaire. In order to determine the extent and location of the wounds, physical exams were performed. To identify correlations between risk variables and wound incidence, data analytic techniques included descriptive statistics, chi-square testing, and logistic regression. The results can be used to develop targeted treatments for the improvement of these animals' welfare and health.

2.6 Ethical Considerations

The study on wounds in working donkeys in Duna Wedda focused on ethical considerations and animal welfare protocols. Informed consent from donkey owners and proper handling techniques were employed to minimize distress. The study received approval from ethical review boards and adhered to animal welfare guidelines. Measures were taken to minimize pain and discomfort during examinations and sample collection, while ensuring confidentiality and respectful reporting. This approach contributed to understanding and improving donkey health.

3. Results

3.1 Overall Prevalence

According to this study, there were 175 working donkeys with wounds overall prevalence of (45.0%). Male donkeys had a higher prevalence of wounds than female donkeys, older donkeys had more wounds than younger donkeys, and donkeys with poorer body conditions had more wounds than those with good body conditions (Table 1).

Table 1. Prevalence of wounds concerning sex, age, and body condition of donkeys

Variables	No of examined	No of affected	Prevalence (%)	X^2	P-value
Sex					
Male	208	103	49.5	16.24	0.013

Female	176	72	40.9		
Age					
Young	32	9	28		
Adult	196	90	45.90	38.66	0.001
Old	156	76	48.70		
BCS					
Poor	315	151	47.9	7.83	0.00
Good	69	24	34.7		

There was a statistically significant (p=0.021) difference among the type of wounds in donkeys. Abrasion was the highest wound type and incise 12(3.12%) was the least type of wound in donkeys (Table 2).

Table 2. Prevalence of types of wounds in donkeys

Type of wound	No of affected	Prevalence (%)	X^2	P-value
Abrasion	99	25.78		
Laceration	36	9.37		
Puncture	28	7.3	78.33	0.021
Incise	12	3.12		
Total	175	45		

3.2 Distribution of Wounds with Sites

A significant difference (p=0.004) was also observed in the distribution of wounds among different parts of the body in working donkeys where the highest numbers of wounds were recorded on prescapular while the lower number of wounds were recorded on the shoulder.

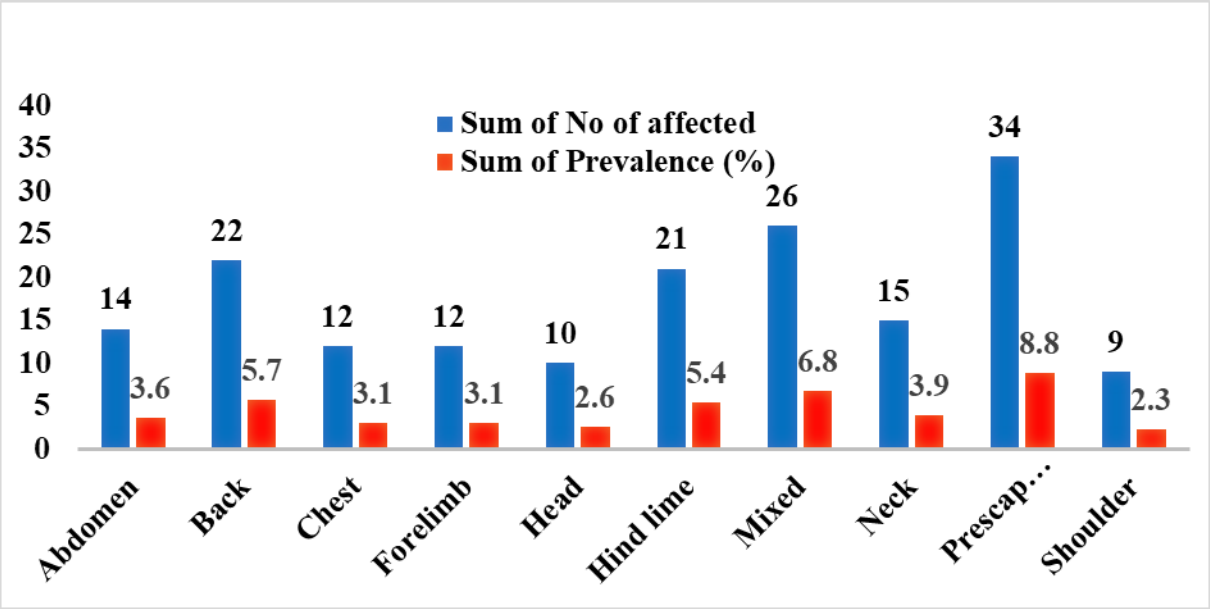

Figure 2. Overall Graphical Distribution of Wound on body sites

3.3 Causes and Risk Factors of Wounds in Working Donkeys

Inadequate harnesses and biting were the main causes of wounds in donkeys. Falling was the reason why there were less wounds. The numerous sources of wounds in donkeys varied significantly (p=0.000) (Table 3).

Table 3. Causes of wounds in donkeys

Causes of wound	No of affected	Prevalence (%)	X^2	P-value
Improper harness	53	13.38		
Infection diseases	18	4.68		
Injury by sharp objects	21	5.4		
Overloading	15	3.9	43.63	0.000
Falling	9	2.3		
Biting	47	12.2		
Unknown	12	3.1		
Total	175	45		

The study on wounds in working donkeys in Duna Woreda, Hadiya Zone, Ethiopia, has important implications for local communities, animal owners, and policymakers. The findings raise awareness among local communities about the prevalence and causes of donkey wounds, emphasizing the need for proper care and injury prevention. Implementing educational programs on wound prevention and treatment can benefit communities and improve donkey welfare, as these animals are important for transportation and economic activities. For animal owners, the study provides insights into the risks and consequences of donkey wounds, encouraging preventive measures and regular veterinary care to protect donkeys from suffering and enhance productivity. Policymakers can use findings to improve veterinary care, donkey education, and working conditions, promoting sustainable development and community welfare for working donkeys.

4. Discussion

The study conducted in Duna Woreda, Ethiopia, focused on the prevalence, causes, and risk factors of wounds in working donkeys. The overall prevalence of wounds was found to be 45%. Early detection and timely treatment of infections were emphasized as very important for minimizing their severity and impact on donkey health. Prompt detection allows for immediate intervention, preventing further damage and complications. Timely treatment helps prevent the spread of infections and reduces the economic burden associated with donkey healthcare. Implementing preventive measures, such as proper harnessing techniques and training programs, is essential. The study highlights the need for awareness, education, and access to veterinary care to ensure the welfare and productivity of working donkeys.

In the current study, the overall prevalence of wounds in working donkeys was 45%. This result was lower than the report of 79.4% in Hawassa (Biffa & Woldemeskel, 2006), and 59% in Jordan (Burn et al., 2007). This might be due to variations in management and husbandry to the donkey in the region. This study found that males had a higher proportion of wounds than females, with 45.5% of wounds occurring in males and 40.9% in females. This might be due to males being most frequently used for work than females and are hence highly exposed to wound injury in the present study area.

The present finding showed that 28% of wounds were in young, 45.9% were in adults, and 48% were in old donkeys. This suggests that older and adult donkeys had a higher prevalence of wounds due to a lack of management, feeding, and health care provision. Donkeys with poor body conditions had the highest rate of wounds (27.1%), followed by those with good body conditions (34.7%). Common wounds were found in the back and prescapular region, with the hind limb being the most common at 5.4%.

According to this study, poor harnessing was the primary reason for accidents in the region, causing different distribution of weight and injuries. Biting, being struck by a sharp item, contracting an illness, being overloaded, and falling were some other typical causes of wounds. This result agrees with those in central Ethiopia published by Pearson et al. (2002). Bacterial infections and colic pathogens were identified to be the culprits behind infection-related injuries, which manifested as symptoms including abscesses and ulceration.

5. Conclusion and Recommendations

This study found a 45% prevalence of wounds in working donkeys in Duna Woreda, with risk factors including improper harnesses, biting, and overloading. Male donkeys had a higher prevalence than females, and older and adult donkeys had a higher prevalence. The most common sites of wounds were the prescapular region, back, and hind limb. Improper harnessing and biting were the main causes, followed by injury by sharp objects, overloading, falling, and infection-related injuries. The most common types of wounds were abrasions, followed by lacerations, punctures, and incisions.

Proper nutrition, hygiene, and rest periods are crucial for preventing injuries in working donkeys, as highlighted

by research conducted in the study Area. Providing adequate nutrition helps strengthen donkeys' resistance to injuries, while maintaining good hygiene reduces the risk of infections. Regular rest periods allow donkeys to recover and prevent fatigue-related injuries. Implementing these practices is essential for improving the well-being of working donkeys, reducing the prevalence of wounds, and ensuring their sustainable contribution to communities and the economy. Based on the current findings of the study, the following recommendations were made:

- Improved management practices are needed to prevent and reduce the occurrence of wounds in working donkeys, such as proper harnessing techniques, regular inspection of equipment, and adequate rest and care.
- Donkey owners and handlers should be educated and trained on proper handling, harnessing, and care of donkeys to raise awareness of wound prevention and promote better practices.
- Donkeys should have access to veterinary care for regular health check-ups, vaccinations, and prompt treatment of wounds to prevent and manage them.
- Collaboration with skilled artisans and experts in saddle and harness design can help improve the design and quality of saddles and harnesses used for working donkeys, reducing the risk of injuries.
- Research and monitoring programs are needed to reduce the occurrence of wounds in working donkeys and improve their health and welfare.

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