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## Retrospective assessment of equine' health problems in Hawa Gelan district, Oromia, Ethiopia

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### Abstract

**Background:** Although equines contributed vital role in human livelihoods through direct and indirect contributions to financial, human and social capital, emphasis has not been given to study the welfare issue which include health problems and management requirement. A retrospective study and questionnaire survey was conducted to assess the health and the welfare problem of equines coming to the Gaba Arbii Veterinary clinic for treatment at the Hawa Gelan district, Geba robi Veterinary clinic, Oromia, Ethiopia. Data on 448 Equines from 2018 to 2020 were analyzed from the data record sheet kept by the clinic.

**Results:** The most common case for wound occurrence were back sore 135(30.0%), chest wound 37(8.0%), bite 27(6.0%) and combined wound of both back and bite 14(3.0%). The finding indicated that the occurrence of wound in Equines having poor 170 (64.0%), medium 41(34.0%) and good 7(12.0%) body condition and this was found to be statistically significantly associated ( $p=0.000$ ). Among the common health problems and abnormalities encountered in Equines back sore wound 135(30.0%), lameness 92(20.0%), parasitic infestation 60(14.0%), chest wound 37(8.0%) and signs of colic 34 (.0%) were the major problems encountered in Equines coming to clinic for treatment with there was no a statistically significant difference among different years. In addition to body condition, the occurrence of wounds was found to be statistically significantly associated with age category and work type. In addition, pack Equines experienced higher lameness occurrences as compared to cart Equines and it was statistically significant ( $p>0.05$ ). In addition to health related problems, the questionnaire survey conducted also revealed welfare problems such as management condition, overloading, working hour, housing problems, and wounds due to harnessing were the major welfare problems of Equines in the study area.

**Conclusion:** This retrospective study and questionnaire survey revealed the significant health and welfare problems of Equines that need to be addressed in order to improve welfare status, their health and working efficiency. Therefore, there should be immediate awareness creation for community, government, community, local service providers and policy makers on welfare issue of Equine and health management in the study area in particular and in the country in general.

**Keywords:** Equines, Hawa Gelan district, pack animal, retrospective, welfare problems, and wound

### Introduction

**Background:** It is has been long time since Equines being used by human being. They are a vital animal in supporting livelihoods of marginalized group in many region of Africa [1] Equines contribute vital role in human livelihoods through their direct and indirect contributions to financial, human and social capital. They are also important in communities' and households' socio-cultural lives, as they are often used in celebrations and in supporting households in need by being lent and shared between families [2].

Distribution of donkeys in the world shows 98% of them to be found in developing countries. Of this, Africa contributed more than 11.6 million for the world [1]. Ethiopia owned 40% of Africa donkey population with about 5.2 million donkeys which is 44% in Oromia, 34% in Amhara and 19% in Tigray regional states [3].

Equines is still mentioned at the first as one of the most important drought animals contributing a significant role in the agriculture sector of developing country. Spetially in Ethiopia donkeys are considered as a better option than other draft animal because of their long time tolerance for dehydration, low sweating rate and good thermo-ability.

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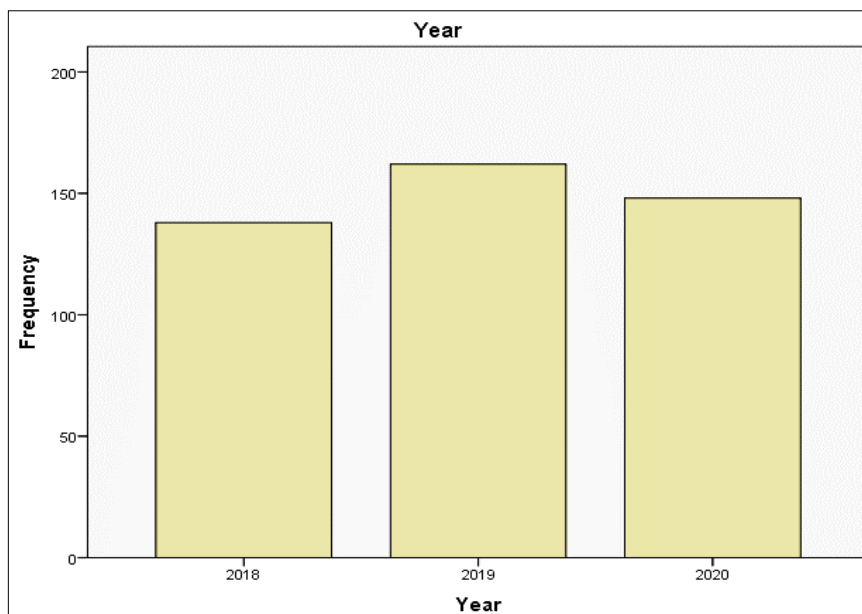
Frequent occurrence of drought in Ethiopia causes an increase cattle death which may result in an increase donkey usage as a draft and pack animal largely in rural area and with a little in urban areas. Donkey contributed over 50% of animal energy scenario in the country. Donkey is well adapted more than both mule and horse in Ethiopian [4]. Although Equines contributed prominent role in Ethiopia agriculture sector, much emphasis has not been given to study the welfare issue which include their physiology, nutritional requirement, health problems and management requirement. Equines in Ethiopia at least in the donkey health and welfare project (DHWP) operation sites are subjected to variety of health disorder including multi parasite, back sore and other wounds, hoof problems, colic and various infectious diseases such as strangle, tetanus, Africa horse sickness (AHS) and others [5]. As the welfare of animals, Espetially donkey needs to be protected to live peacefully in their environment without affecting their health and welfare. They must not unnecessarily be neglected to have access for feed, water and shelter or

abused by beating and harming and deprived of freedom of movement and exercise [6]. The objective of this retrospective study is thus, to document and compare the prevalence and distribution pattern of assessment of Equines' health management and to identify common disease in Equenes in Hawa gelan District Gaba robi Veterinary Clinic, Oromia, Ethiopia. This work may benefit researchers, veterinary practitioners and other animal health workers.

**Results**

Number of recorded Equine cases handled and get treatment at Hawa gelan District, Gaba robi Veterinary clinics from 2018-2020.

The data record format showed that some Equine were coming to Hawa gelan district Gaba robi clinic to get treatments against different health problems during the year 2018-2020. A total of 448 Equines conditions and patient profile were recorded from casebook during the three year period at Gaba robi veterinary clinic.



**Fig 1:** Number of Equines got treatment at the Gaba robi district clinic s during the year 2018-2020.

**Descriptive statistics of Equine in the study sites with different variables from retrospective study**

The present study revealed that the body condition score of the Equine is showed 58.9% of the Equines were with poor

body condition score, while it is only 13.8% of the Equines had well to ideal body condition. The Equine in the study areas were predominantly 267(59.6%) carry pack while 142(31.7%) were pulling a cart (Table 1).

**Table 1:** Descriptive statistics of Donkey in the study sites with different variables

Variables	Category	Examined animals	Percent
Sex	Female	210	46.9
	Male	238	53.1
Age	Adult	253	56.5
	Old	102	23.0
	Young	93	21.0
Work type	Cart	142	32.0
	Not started work	39	9.0
	Pack	267	60
Body condition	Good	62	14.0
	Medium	122	27.0
	Poor	264	60
Total		448	100.0

**Common diseases problems of working equine diagnosed and treated at Geba robi Veterinary clinic**

The present retrospective study has revealed equines were suffering from multiple health and welfare problems in the study area. Wound problem (Back sore, Bite), lameness, colic, ophthalmic problems, accidental injury, different

infectious and parasitic diseases were the major problems encountered in Equines during the year 2018-2020 (Table 1). The common health problems and abnormalities in equines were back sore wound 135(30.1%), lameness 92(20.5%), parasitic infestation 60(13.6%), chest wound 37(8.3) and signs of colic 34 (7.6%) (Table2).

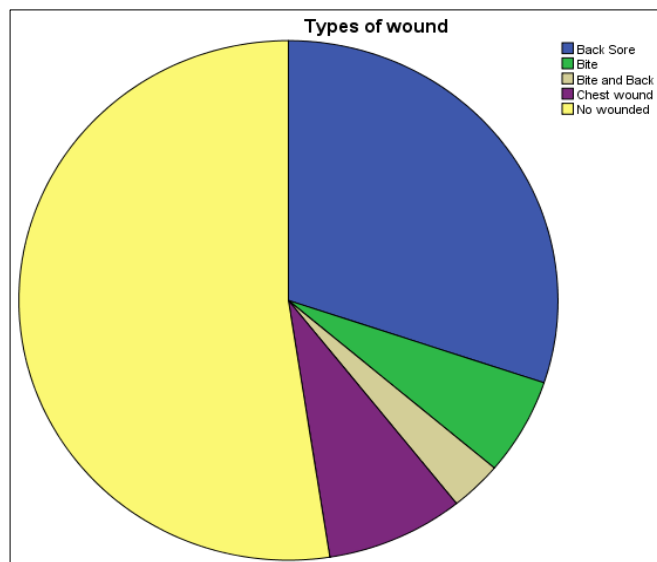
**Table 2:** Common health problems of working donkeys diagnosed and treated at Dale Sadi district Haro Sabbu veterinary clinic (n=448).

Year	Examined	Case presentation to clinic											χ <sup>2</sup>	P-value
		Back Sore	Bite	Bite and Back sore	Chest wound	Colic	Infectious	Injury	Lameness	Ophthalmic	Parasitic	Prolapse		
2018	138	35(25.4)	9(6.5)	4(2.9)	12(8.7)	13(9.4)	9(6.5)	1(0.7)	34(24.6)	2(1.4)	16(11.6)	3(2.2)	11.970	0.917
2019	162	58(35.8)	9(5.6)	4(2.5)	12(7.4)	13(8.0)	9(5.6)	2(1.2)	28(17.3)	3(1.9)	22(13.6)	2(1.2)		
2020	148	42(28.4)	9(6.1)	6(4.1)	13(8.8)	8(5.4)	11(7.4)	(0.0)	30(20.3)	2(1.4)	22(14.9)	5(3.4)		
Total	448	135(30.1)	27(6.0)	14(3.1)	37(8.3)	34(7.6)	29(6.5)	3(0.7)	92(20.5)	(1.6)	60(13.4)	10(2.2)		

**Prevalence of wound**

The overall prevalence of wound was 49.0%. Most common sites of wound occurrence in the equines were back sore

135(30.1%); chest wound 37(8.3%); bite 27(6.0%) and combined wound of back and bite 14(3.1%) (Figure 2).



**Fig 2:** Types of wound problems of working equines treated at Geba robi Veterinary clinic during the years 2018-2020 (n=448).

There was a statistically significant difference in the prevalence of wound among different age groups (P=0.002). In addition, pack Equines experienced higher wound occurrences as compared to cart equines and it was statistically significant (p>0.05). The finding also indicated that 170 (64.4%), 41(33.6%) and 7(11.6%) were having

wound in poor, medium and good body condition scores respectively. The body conditions of working donkeys were found to be statistically significantly associated with the occurrence of wound (Table 3). This study showed that 56.5% of the equines in Hawa gelan district used for work were adults while about 20.8% of the equines were young.

**Table 3:** The association of risk factors with wound occurrence, from Hawa gelan `district, Ethiopia.

Variables		Number of examined donkey	Positive	Percentage	χ <sup>2</sup>	P. value
Sex	Female	210	101	48.01	0.051	0.822
	Male	238	117	49.2		
Age	Young	93	44	47.3	12.485	0.002
	Adult	253	109	43.1		
	Old	102	65	63.7		
Year	2018	138	62	44.9	1.738	0.419
	2019	162	85	52.5		
	2020	148	71	48.0		
Work type	Pack	267	105	39.3	26.793	0.000
	Cart	142	94	66.2		
	Not started yet	39	19	48.7		
Body condition	Poor	264	170	64.4	71.885	0.000
	Medium	122	41	33.6		
	Good	62	7	11.3		

**Prevalence of lameness**

Among 448 Equine patients admitted to the clinic to get treatment, 92(20.5%) were treated for different types of lameness. The prevalence of lameness in pack carrying

equines was found to be 49((18.4%). The common type of lameness were hoof problems 65(14.5%), joint problems 14(3.1%) and long bones problem 13(2.9%) (Table 4).

**Table 4:** The association of type of work with lameness occurrence at study area.

Work type	Number of treated	Total lameness	Types of Lameness treated			$\chi^2$	p.value
			Hoof	Joint	Long bone		
Cart pulling	142	16(11.3)	11(7.7)	2(1.4)	3(2.1)	14.044	0.029
Still didn't started work	39	7(17.9)	5(12.8)	2(5.1)	0(0.0)		
Pack carrying	267	69(25.8)	49(18.4)	10(3.7)	10(3.7)		
Total	448	92(20.5)	65(14.5)	14(3.1)	13(2.9)		

**Results of questionnaire survey**

**Demographic characteristic of interviewers in the study area**

Demographic characteristics of interviewers showed educational background of the equine owners showed 54.4%

were illiterate and only 29.8 and 8.8% attended elementary and secondary school level, respectively. Regarding with age category over 54% of the equine owners were adults (Table 5).

**Table 5:** Demographic characteristic of interviewers in the study area

Variables		Interviewed	Percent
Education	Illiterate	62	54.4
	Primary	34	29.8
	Secondary	10	8.8
	More than secondary	8	7.0
Age	Young	18	15.8
	Adult	62	54.4
	Old	34	29.8
Sex	Female	31	27.2
	Male	83	72.8
Peasant Assotation	Kela	19	16.7
	Mojo	13	11.4
	Wacho	14	12.3
	Megabi	34	29.8
	Geba robi	34	29.8

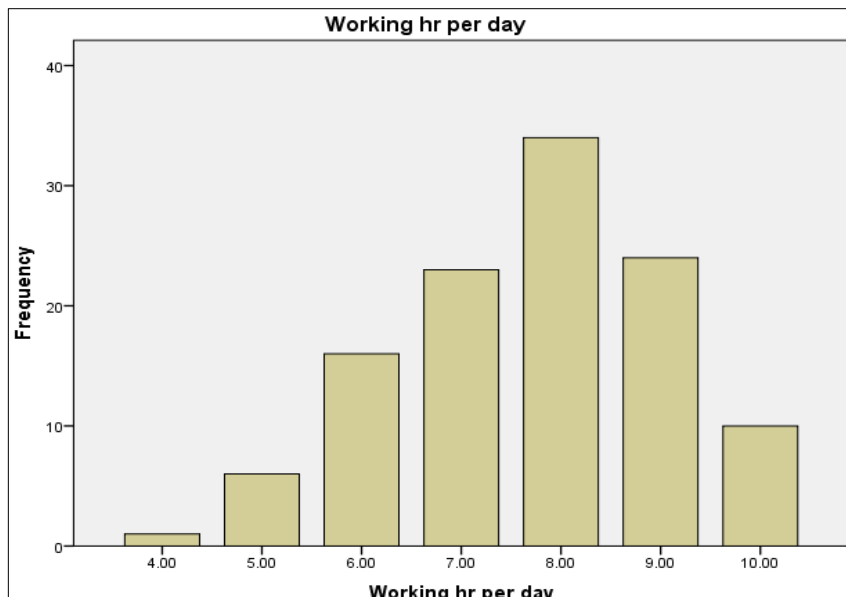
**Results of Management and working condition of donkeys**

Majority of the respondent (82.5%) reported that equines in the study areas depend on both cereals/grain and grass feeding since. Over 42.1% of the owners reported that they work with their equine three times per week, while 20.2% work twice a week. As observed in this study, over 79.8% of the owners reported that equines are housed at night together with other animals in purposely built enclosures. Our findings have shown that among those who explained their practice on the castration of their equine about 53.5%

castrate their equine at veterinary clinic while 31.6% of the owner's choices traditional methods of castration practice. But 14.9% respondents were reported that they do not practice castration of their donkeys because they think that castration decline working capacity and life span of their equines. Regarding the use of improved harness 65.8% donkey owners did not used improved harness and only 34.2% of the owners had been using improved harness (Table 6).

**Table 6:** Result of ownership, management and working condition of donkeys in the study area

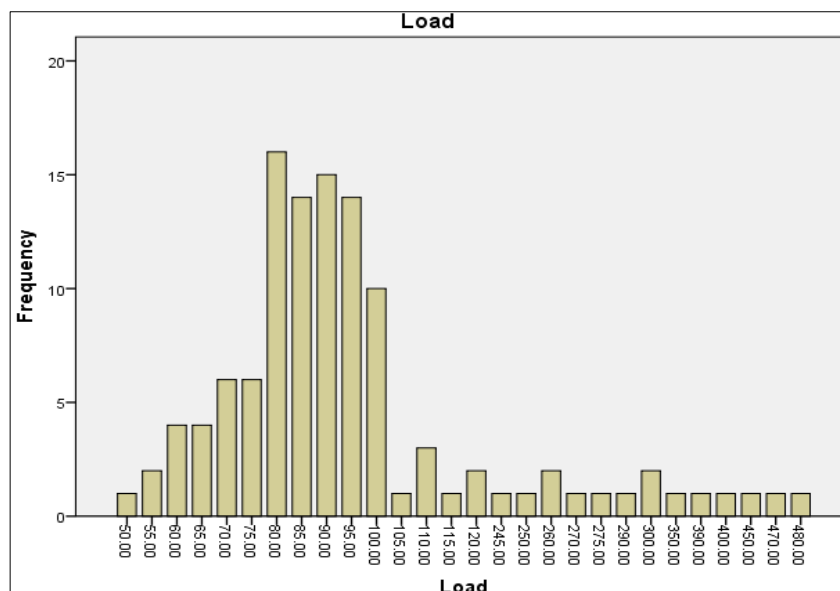
Variables	Category	Frequency	Percent
Castration condition	Castrating at clinic	61	53.5
	Castrating at home	36	31.6
	Not castrating equine	17	14.9
Ownership of the equines	One animal	60	52.6
	Two animals	36	31.6
	Three animals	18	15.8
Working type of Equine	Cart	20	17.5
	Pack	94	82.5
Working times per Week	One	15	13.2
	Two	23	20.2
	Three	48	42.1
	Four	18	15.8
	Five	10	8.8
Feeding practices	Both cereals/grain and grass	94	82.5
	Straw and grass	20	17.5
Housing practices	Housed with other animals	91	79.8
	Housed with other animals	23	20.2
Use of improved harness	Not using improved harness	75	65.8
	Using improved harness	39	34.2



**Fig 3:** Frequency distribution of working hour per day of equines from interviewed respondent

According to the above figure (Figure 3) most of the equines spend day time working, and have a limited time roaming

around and/or grazing, if available. On average (7.71), equines were working per day for 4 to 10h interval.



**Fig 4:** Frequency distribution of load per Kg of equines from interviewed respondent

As shown on the Figure 4, the present study revealed that the majority of the respondents reported that the average weight that their equines load was 88.08 kg (50-120 kg) for pack carrying donkey and 259 kg (245-480kg) for cart pulling donkey. The majority of load carried at a time was above the capacity of the animal, taking the assumption that a equines should carry one third on its pack or a triple of its body weight if pulling in cart (The Donkey Sanctuary Ethiopia, annual report, 2017).

**Discussion**

This study has indicated many health, management and welfare problems in the donkeys to coming clinics to get treatments in and around Hawa Gelan district, Geba robi town. Although the majority of the equines 253(56.5%) were adults, about 102(22.8)% of equines were old and 93(20.8%) young. With regard to this there are owners begin to use equines for work before their age are mature

enough in this study area. Until equines age are mature enough, it is not recommended to use for work as this can expose them to several health and structural abnormality such as sore back problem and lameness [10].

Although good body condition was observed in 62(13.8%) of the equine, the majority 264(58.9) of the equines were seen with poor body condition. Another study in Ethiopia also agree with the current finding that majority of the donkeys were found poor body condition [10]. This may indicate that poor body condition might be one of the main risk factors for the high incidence of back sore, due to less muscle coverage of emaciated animals. The main reason for poor body condition score of equines are health related problem, improper management related activity and scarcity of feed.

According to the current study result the overall occurrence of wound was 48.7%, which is lower than the previous report which were 58.0% [11], 77.5% [12] and 79.4% [13] in



Ethiopia. The present finding is also lower than (59%) the report from outside of Ethiopia in Jordan <sup>[14]</sup>. The difference in occurrence of wound at different study area in equines might be due to the variation in working conditions, educational level of equine owner's, age at which the equines begin work, management condition and body condition of donkeys <sup>[15]</sup>.

Most common sites of wound occurrence in the equines were back sore 135(30.1%) and chest wound. These finding is almost the same with the result of similar works done in Ethiopia <sup>[10, 16]</sup> and Mexico <sup>[17]</sup>. The occurrence of back sore wound in the donkeys might be caused by an integration of several causative factors related with management, category of harness material and not well appropriate harnessing and lack of padding on the back of the animals <sup>[15]</sup>. Hence, there was a statistically significant difference in the prevalence of wound among different age groups, body condition score and types of work.

Relating the work type with occurrences of wound, higher incidence of wound was seen in poor body condition 264(58.9%) equine than good 62(13.8%). This finding is probably due to the fact that, equines with a poor body condition index might have less natural padding coverage, which could be protecting them from friction, lesions and pressure during carrying pack or pulling cart. But, the report from another study in morocco is not in agreement the finding of the current study <sup>[18]</sup>.

The other causes for occurrence of wounds of equines at this study site are bites. Bites may result due to bitten by different types of animals such as hyena, dog and it may also occur from fighting between males equine, as the of castrating male equine is not well practiced in the areas, and this may lead to aggressive behaviour to each other <sup>[19, 5]</sup>.

This study revealed abnormalities in movement of equine admitted to the clinic to get treatment were treated for different types of lameness and this may suggest that equines were overloaded which leads to tendon or other structural damage. The finding of this retrospective study also reflects the common type of lameness were hoof problems 65(14.5%) which was less than the previous study report (18.2%) in Mekelle city <sup>[20]</sup> and (32.2%) in Jordan <sup>[21]</sup>. The observed incidence of hoof problems may result from lack of proper hoof trimming, the lack of veterinary services, travelling of equines in inappropriate rough land surface in the study area and this might have predisposed them to hoof puncture with sharp objects such as nails and broken glasses. In study conducted at different time by several authors similar hoof problems were reported in different area of Ethiopia and somewhere outside of Ethiopia <sup>[22, 5, 23, 24]</sup>.

On this study, there was a statistically significant difference in the prevalence of lameness among different work types. Concerning work type higher prevalence of lameness was observed in pack carrying equine than cart equines. This may shows that the equines are not in suitable condition with their owners. This might be due to less understanding of the behaviour of the equines by the owners, poor understanding of the animal welfare issues and less appropriate working workingent functioning.

This study revealed colic cases 34(7.6%) as one of health problems encountered at the study area. Colic occurrence at this study area might be due to the ingestion of a foreign body such as plastic materials and impaction due to ingestion of excessive coarse, dry and high fiber feeds

which may cause gastrointestinal disturbance. These findings are similar with the finding of other author in Ethiopia <sup>[5]</sup>.

Among the finding of cases parasitic infestation, different types of infectious cases, rectal prolapse and ophthalmic problem in this study was consistent with the results of the study made by other author from Ethiopia <sup>[5, 25]</sup>.

Results of questionnaire survey showed that majority of equine owners were not having knowledge on equine welfare issues. This may result from due to the educational level attained by majority of the equine owner illiterate and also most of them are not practice improved harness which compromise welfare of equines.

According to this study the average weight that their equines load was 88.08kg (50-120 kg) for pack carrying equine and 259 kg (245-480kg) for cart pulling donkey. Generally, a equine should not carry more than one third of its body weight <sup>[15]</sup>. It is believed that the overloading and overworking are the predisposing factors for the occurrence of wound <sup>[26]</sup>. External injuries due to overwork and overload have also reported by other scholars <sup>[13, 18, and 27]</sup>.

The finding of questionnaire survey also showed majority of the respondent (82.5%) reported that equines in the study areas depend on only both cereals/grain and grass feeding which could be the main risk factor for poor body condition. This clearly shows that apart from health and management related problems, shortage of feed may be a major contributory factor for poor body condition of the donkeys. This study result is similar to the other report from Ethiopia <sup>[10]</sup> in which poor body condition might also be one of the contributory factors for the high incidence of back sore, due to less muscle cover.

## Conclusion

In problems of working equines in the study area. This study has also attempted to cast light on the significant health problems of working equines that need to be addressed in order to improve their health and working efficiency. Therefore, there should be massive awareness creation on animal welfare and health management to the people working with equines and the general public. There must be also significant endeavour at multiple stages; community, local service providers and policy level to improve the neglected welfare statue of working equines in the area in particular and in the country in general.

## Materials and Methods

### Study area and period

The study was conducted from January 2018 to April 2020 retrospectively by using donkeys' patient case registration books in Hawa gelan District Geba robi Veterinary clinic, Oromia Western, Ethiopia. The Hawa gelan district is located in Ethiopia, Kellem Wollega zone of Oromia regional state, situated at 600 Kilometres West of Addis Ababa. The mean annual rain fall in Hawa gelan district ranges from 1150-1300mm. The annual temperature ranges from 26-34 °C. The district has altitudes ranging from 1200-2000 m above sea level. The district has large rivers like Birbir, keto and Mojo river. The areas have got a number of wild animals such as African buffaloes, Bush pigs, warthog, bush buck, kudu, hippopotamus, crocodiles, hyena, antelopes and snakes. Agriculture is the main stay of the livelihood of the society with mixed farming system and livestock play an integral role for agriculture <sup>[7]</sup>. The animal

population of the district is estimated to be 95,189 cattle, 29,600 sheep, 29,699 goats, 191 horses, 480 mules, and 3899 donkeys [8].

### Study animals

The study animals were Equines in Hawa gelan District of Geba robi town and the surrounding local peasant association of wacho,kela, megabit village and coming to geba robi Veterinary clinic for treatment against different health problems. Most of the donkeys were from the and some are from the different surroundings Peasant Association (PA). The body condition score were classified as poor, medium and good by observing the body condition of the animals in the field [9]. The study animals were 448 donkeys' population and they were coming to the clinic for treatment from different kebeles' (the smallest administrative unit) of Hawa Gelan district.

### Study design

#### Retrospective studies

The case files of equine from the clinical case record book of the Hawa gelan District, Geba robi Veterinary clinic and personal case record book were used to retrospectively assess data on the different health, management and welfare problems of working equines from January 2018 to April 2020. The data collected retrospectively from the clinic for treatment were stored either electronically or on a data record sheet as a hard copy. Data from daily clinical record formats/sheet were entered into Microsoft Excel spread sheet. The data were coded into categories of clinical findings for each donkey. The categories were defined according to the systems affected, types of the problem and the cause of the problems. A total of 448 records of equines from 2018 to 2020 were extracted and organized for further analysis. The sampling unit was donkey patient encounters at Hawa gelan District Geba robi Veterinary clinic to treat different acute and/or chronic illness.

#### Questionnaire survey

A structured questionnaire was designed and validated to study the welfare of donkeys including the number of equines owned, magnitude of work and management of equines. All individuals those are owners of equine those have willingness to participate in the study and ready to give the required information were communicated to provide us with relevant information. The questionnaire was randomly administered to equine owners, drivers coming to the Geba robi veterinary clinic to collect relevant information about working equines welfare issues in the study area. For the purpose, total of 114 equine owners were interviewed. The question was constructed in English, but during the interviews, the interviewer's were translating the questions were into Afan Oromo language. The questionnaire was administered through face to face interview.

#### Data Collection

An excel sheet data collection format was designed and then data was collected on the different health, management and welfare problems of working equines from January 2018 to April 2020 retrospectively by using patient case registration books in Hawa gelan District Geba robi Veterinary clinic. For this study, 448 equines data record that contain the animal's characteristics (age, sex, breed, body condition, clinical signs and symptoms observed); disease diagnosis

(name, empiric or physical clinical examination and confirmatory laboratory tests used) and prescriber's signature, level of education and years of experiences were collected retrospectively for 3 years period from January 01, 2018 to April 31, 2020. Cases of cattle, shoats, horses, mules and pet animals were not included in this study as they were programmed for another study in the future. Equines presented for castration were also not also included in this study.

#### Data analysis

The data collected was stored in the Microsoft-Excel Spread Sheet and analyzed using SPSS Version 20. Descriptive statistics was used to summarize the data. Pearson's Chi-square test was used to check the association between variables. P-value less than 0.05 at 95% confidence level was considered in interpreting the results.

#### Abbreviations

DHWP; Equine Health and Welfare Project; WVA; World Veterinary Association; AHS African Horse Sickness

#### Authors' contributions

Author has been made significant contribution to title selection and designing of the study, retrospective data acquisition, questionnaire data collection, analysis and interpretation of data; took part in writing the article and revising it critically for important content; agreed to submit the manuscript; gave approval to be published; and agreed to be accountable for all aspects of this work.

#### Funding

Not applicable

#### Availability of data and materials

All data generated and analyzed during this study are included in Figure 1, Figure 2, Figure 3, Figure 4, Table 1, and Table 2. Table 3, Table 4 Table 5 and Table 6. However the raw data is available from the corresponding author up on reasonable request.

#### Ethical approval and consent to participate

Ethical approval is not applicable as the study was an observational study and no animal and human were subjected to suffer as a result of this study. But the researchers got permission for access to data from Hawa gelan district livestock and Fishery office. Confidentiality of treatment prescriber data for patients' was maintained by using unique code. All individuals involved in questionnaire are those who have willingness to participate in the interview and ready to give the required information were communicated to provide us with relevant information. Volunteer participants, from whom their verbal consent was obtained, were interviewed. Following detailed discussion about the objectives of the study with each participant, the face-to face interview was conducted.

#### Competing interests

The authors have not declared any conflict of interests.

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