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Dynamics of Sheep Diseases and Disorders in the Coastal Areas of Bangladesh: Analyzing Frequency and Patterns

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Abstract

Sheep farming is gaining popularity nowadays; however, its expansion is being restricted by numerous diseases and disorders. The study aimed to assess sheep disease prevalence, trends and apply preventive measures. From January 2018 to December 2021, a study was conducted among sheep farmers in Companiganj and Subarnachar Upazilas of Noakhali, Bangladesh. Clinical records and disease diagnoses have been made based on pertinent clinical history, observations, and relevant tests performed in laboratories. Data were analyzed using MS Excel 2018 and SPSS 26.0. Sheep diseases were categorized by cause, year, sex, age, and season. Diarrhea (19.94%), gastrointestinal (GI) parasitic infections (15.98%), pneumonia (14.97%), alopecia (13.86%), mastitis (7.15%), dermatitis (6.71%), and enterotoxemia (5.74%) were the most frequently observed clinical conditions. Subarnachar exhibited a higher disease prevalence (53.59%) compared to Companiganj (46.41%). Sheep diseases were most common in winter (38.74%), followed by the rainy (34.38%) and summer (26.88%) seasons. Growing sheep had higher disease rates than lambs (31.28%) and adults (27.09%). Finally, the prevalence rate of female sheep was significantly higher (73.16%) than that of male sheep (26.84%), as indicated by the statistical analysis ($p<0.05$). These findings suggest that appropriate preventative efforts are needed to prevent these diseases and their consequences.

Keywords: Bangladesh, Diseases, Dynamics, Prevalence, Season, Sheep

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Introduction

Sheep are an important part of livestock and are reared in different parts of the world due to their excellent adaptation capability in various climatic conditions (Skapetas and Kalaitzidou, 2017). This sector also employs millions of people worldwide, especially in underdeveloped and developing countries. In 2023, according to the United Nations Food and Agriculture Organization, the global sheep population was estimated at approximately 1.2 billion, and almost 42% of sheep are reared in Asia (FAO, 2023). Sheep is an important farm animal in Bangladesh, which is a vital source of income and food, as well as the socio-economic status of poor farmers (Hossain et al., 2023). The sheep population in Bangladesh is 3.90 million and is the third among ruminant species in Bangladesh (DLS, 2024). Sheep farming is becoming more popular among young entrepreneurs in Bangladesh as it earns more profit with a small investment. Native regional sheep have the potential for profitable lamb production, contributing to fulfill the meat requirements, livelihood improvement, and Income Generating Activities (Hossain et al., 2021). It serves a crucial function in global food chains since it provides the majority of animal protein in the form of milk and meat (Mohapatra et al., 2019). It also plays an important role in poverty alleviation of resource-poor and privilege-deprived people. However, the production performance of animals is greatly hampered, and they do not reach the optimal level due to various types of diseases and disorders (Dey et al., 2021). The climatic condition of Bangladesh is suitable for the development of various diseases (Rahman et al., 2020; Haque and Rahman, 2024). These diseases have negative effects on productivity such as delayed growth, decreased live weight gain, reduced reproductive performance, such as fertility, and finally death of the sheep (Asín et al., 2021; Rahman et al., 2022). Regarding these effects, they have a major impact on the economy of the country (Munsi et al., 2016; Dey et al., 2021). By considering this point, the purpose of this study was to investigate the prevalence of sheep diseases and disorders in the coastal region of Bangladesh and mitigate the impact of various risk factors on these infections. The formal authority responsible for the control of sheep ailments and diseases in the country will benefit from this study.

Materials and Methods

Location, animals, and duration of the study

In the southeastern region of Bangladesh, near the Bay of Bengal, the investigation involved the native sheep from selected sheep farmers of two coastal areas, namely Companiganj and Subarnachar Upazila in the Noakhali district from January 2018 to December 2021. This area, located at 22.8226° N (latitude) and 91.0984° E (longitude), receives an average yearly rainfall of 2800 to 3400 mm, with temperatures varying between 16°C and 39°C. The region experiences high humidity levels year-round due to its proximity to the Bay of Bengal. The investigation period was categorized as winter (November–February), summer (March–June), and the rainy season (July–October) according to the local climate (Rahman et al., 2020). The

sheep were divided into three age categories: kid (0-3 months), growing (over 3-6 months), and adult (above 6 months) (Munsi et al., 2016). In addition, clinical cases were also put into groups based on the nature of the diseases and the sex of the sheep. All the sheep were reared in a free-range system in the study area.

Diseases/disorders diagnosis and data recording

The prevailing signs and symptoms, history, gross examination, laboratory testing, gross postmortem lesion, and therapeutic responses guided the diagnosis of the diseases and disorders. For confirmatory diagnosis, feces were taken to identify parasitic eggs under the microscope, and blood was taken to identify protozoal infection. To confirm specific diseases, Enzyme-linked immunosorbent assay (ELISA) and Polymerase Chain Reaction (PCR) were also employed where needed. A register book was properly maintained to record the daily information on sheep health problems.

Analysis of data

The original data was integrated using MS Excel 2018. The prevalence was estimated following the data importation into SPSS 26.0 (SPSS Inc., Chicago, IL, USA). The nature of the diseases, age, year, sex, and season were the determining factors in the appearance of sheep diseases and disorders.

Results and Discussion

Overall Prevalence of Sheep diseases and disorders

In the study area, a total of eleven (11) diseases and disorders were identified during the 2018-2021 period. The prevalence rate of these diseases and disorders was determined accordingly (Figure 1). The overall prevalence of sheep diseases and disorders was 46.41% in Companiganj and 53.59% in Subarnachar in the current investigation (Figure 2). The highest prevalence of gastro-intestinal infection was diarrhea (19.94%), almost five times higher than (5.18%) than Munsi et al. (2016) but lower than (49.33%) by Fesseha et al. (2023). The recorded prevalence rate of PPR was 2.57%, which is significantly lower than (5.16%) stated by Sarker et al. (2015). The second largest prevalence (15.98%) was gastrointestinal (GI) parasite infection, which was nearly four times lower than the 67.9% reported by Poddar et al. (2017) and half of the 33.86% reported by Sarker et al. (2015). These differences may be attributed to the variation in sample size, rearing methods, breed, and various testing methods. Additionally, bloat (5.02%), dermatitis (6.71%), alopecia (13.86%), enterotoxaemia (5.74%), retention of the placenta (2.87%) and mastitis (7.15%). Similarly, fever (0.51%), alopecia (0.88%), pneumonia (1.02%), lameness (1.93%), and malnutrition (2.85%), were other main sheep diseases and disorders, according to Munsi et al. (2016). Moreover, Fesseha et al. (2023) found diarrhea (49.33%), pneumonia (29.33%), managemental problems (2.67%), and predator bites (4%) as important diseases and disorders which was affected sheep in Ethiopia.

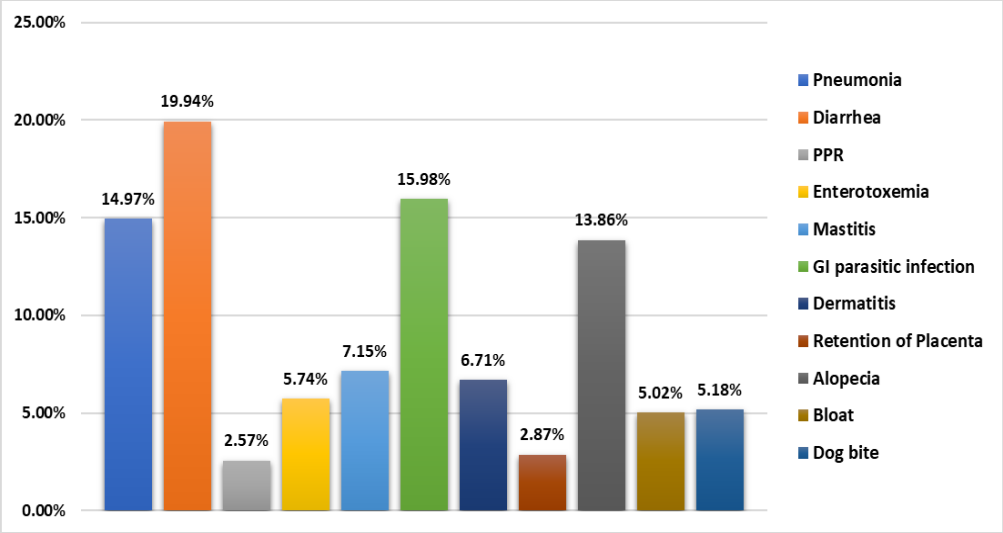

Fig. 1. Overall prevalence of sheep diseases and disorders

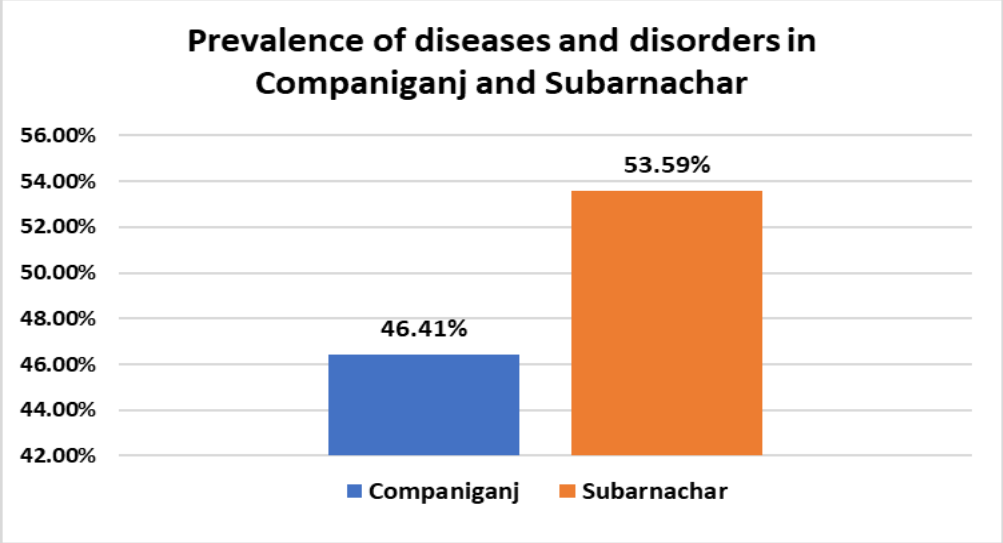

Fig. 2. Location-wise prevalence of sheep diseases and disorders

Annual prevalence of sheep diseases and disorders

The annual prevalence of sheep diseases and disorders spanning the years 2018 to 2021 is illustrated in Figure 3. In 2018, 2019, 2020, and 2021, the prevalence rates of illness and disorders in sheep were 42.47%, 24.50%, 18.39%, and 14.64%,

respectively. In 2018, the highest prevalence rate (42.47%) was seen due to some factors such as poor knowledge about diseases, high humidity and temperature, irregular deworming and vaccination practices, and the lowest prevalence (14.64%) in the year 2021 and this could be due to the regular dipping, deworming, and vaccination to the sheep and improved management practice learned from technical training organized by BLRI. Among 11 diseases & disorders, the highest prevalence of diarrhea (22.50%) and (21.82%) were observed in the year 2018 and 2019 respectively. Similarly, Fesseha et al. (2023) found a higher prevalence of pneumonia (29.33%) in 2023 in sheep of Ethiopia. Based on the yearly trend of diseases and disorders, the present study has demonstrated similarities to prior studies. Furthermore, similar types of sheep diseases and disorders were found in 2016 in Bangladeshi sheep by Munsi et al. (2016).

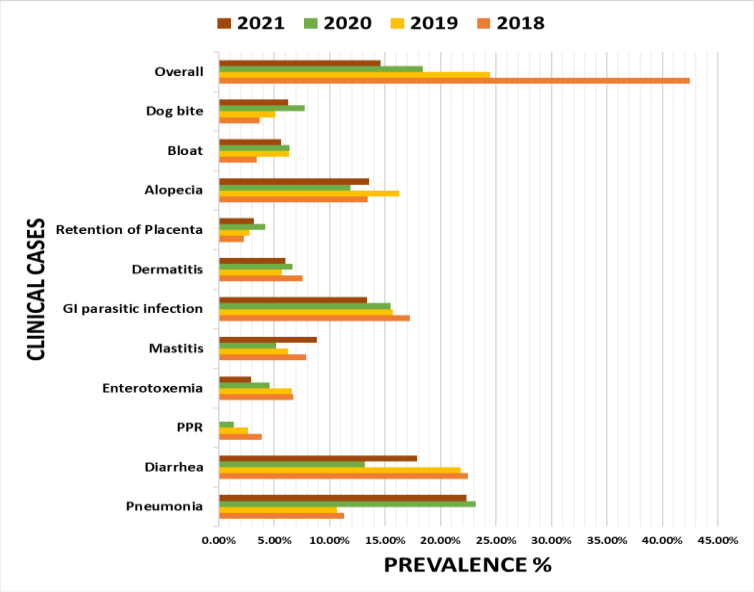

Fig. 3. Annual prevalence of sheep diseases and disorders

Seasonal prevalence of diseases and disorders in sheep

In the present study, Figure 4 illustrates the seasonal prevalence of illnesses and disorders in sheep. In this current investigation, the highest prevalence of diseases (37.14%) was found in winter, while 34.61% in rainy and 28.25% in summer seasons. The differences in results have been attributed to the winter season being highly susceptible to disease prevalence compared to other seasons. Munsi et al. (2016) found similar trends, with more sheep diseases occurring in the winter and rainy seasons than in the summer, as did in the winter season, Haque et al. (2024), also found a higher incidence of goat infections. According to Figure 02, the

prevalence of pneumonia (42.57%), PPR (46.54%), dermatitis (44.92%), alopecia (46.54%), and enterotoxaemia (45.61%) were found to be higher in winter while the prevalence of diarrhea (36.17%), GI parasitic infections (40.51%), bloat (41.34%) and dog bite (42.75%) were found to be higher in rainy season. This finding supports Munsi et al. (2016), who observed a higher prevalence of pneumonia, PPR, Retention of the placenta, and lameness in the winter season. Moreover, pneumonia is most common in winter (16.19%), followed by summer (9.92%) and rainy (7.40%) seasons found by Raquib et al. (2020). On the other hand, Dey et al. (2021) reported the rainy season was the most vulnerable season than the summer (76.3%) and winter (68.9%) seasons. In this current study, a higher prevalence of diarrhea (36.17%) and dermatitis (44.92%) were found in the rainy and winter seasons respectively, similarly, In the winter and rainy seasons, Munsi et al. (2016) observed a higher incidence of dermatitis and diarrhea.

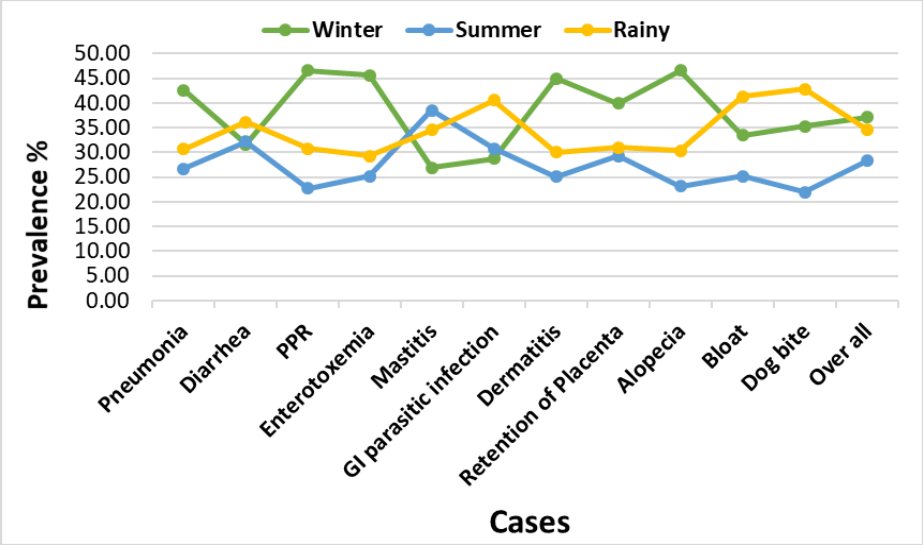

Fig. 4. Seasonal prevalence of sheep diseases and disorders

Prevalence of sheep diseases and disorders in different age groups

The sheep diseases and disorders in kids, growing, and adults are shown in Figure 5. Disease and disorder prevalence was higher (35.56%) in growing animals (>3-6 months) compared to kids (<3 months) and adults (>6 months) in this study. This finding almost matches earlier research, in where Munsi et al. (2016) found that growing sheep had 26.14% more clinical illnesses than adult (12.15%) and lamb (10.93%) and Sangma et al. (2012)) reported the prevalence of helminths in sheep was significantly higher in young (87.0%) than in adult (83.3%) and in lamb (70.9%). Growing larger than three months of age exhibited the highest occurrence of diarrhea (42.86%), dermatitis (45.95%), alopecia (47.97%), and bloat (40.35%) while the

lowest prevalence of pneumonia (27.92%). Haque et al. (2024) found near-identical results, who stated a higher prevalence of diarrhea (47.98 %), and urolithiasis (76.19%) in growing goats. Additionally, Munsi et al. (2016) noticed the growing sheep (>3-6 months) exhibited more prevalent of diarrhea and dermatitis than lamb and adults respectively. In this study, authors observed an almost similar prevalence of GI parasitic diseases in lamb (35.50%) and growing (35.93%) while a 26.72% prevalence of parasitic infections was found in adult sheep. This observation agrees with Dey et al. (2021) who recorded a higher occurrence of parasitic infections in lamb (83.9%) than in growing (78.4%) and adults (75.3%). In addition, the current investigation revealed a higher prevalence of pneumonia (42.05%) and PPR (44.23%) in lamb (<3 months) than growing (27.92% & 30.03%) and adult (29.62% & 26.15%) respectively, Munsi et al. (2016) reported similar findings in which pneumonia was the most prevalent in lamb (1.73%) than growing (0.73%) and adult (0.83%). Although, Alam et al. (2018) recorded a higher prevalence of PPR in young (10.32%) than in adult goats (1.98%).

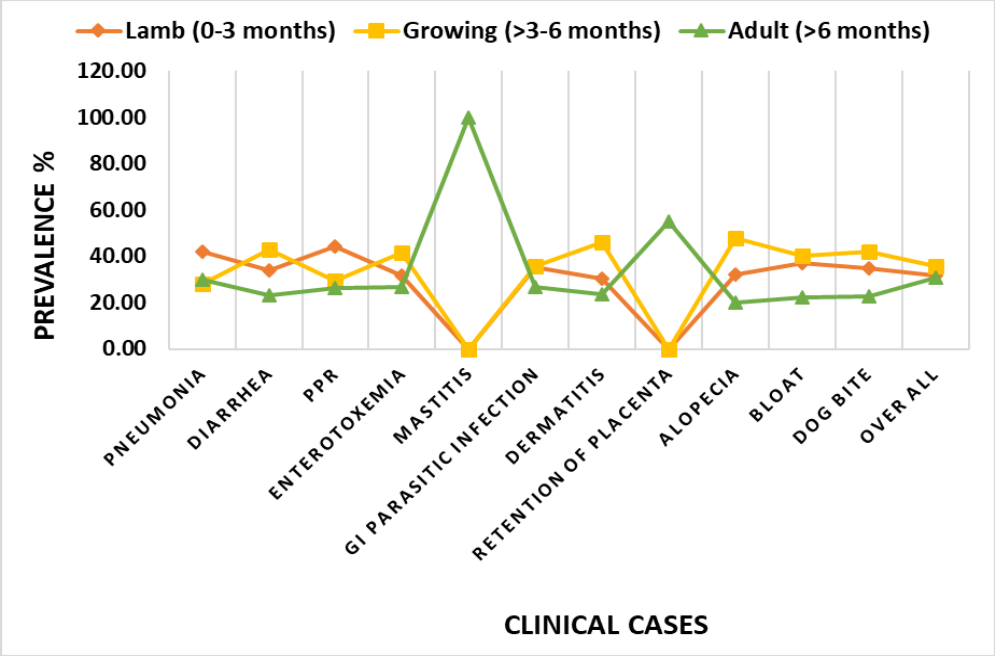

Fig. 5. Prevalence of sheep diseases and disorders by different age groups

Prevalence of diseases and disorders of sheep according to sex groups

The occurrence of sheep illnesses and disorders by sex is illustrated in Figure 6. The findings reveal that females (73.16%) had a higher prevalence of sheep illnesses and disorders compared to males (26.84%), which was statistically significant ($p<0.05$). This was reasonable as female sheep are more susceptible to diseases than male sheep, and several diseases are particular to female sheep. Sangma et al. (2012) found that female sheep (71.43%) were more disease-prone than males (28.57%) and Rahman et al. 2017 observed the prevalence of helminth infection was higher in females (83.3%) than in the male (79.3%) sheep. In addition, Hossain et al. (2023) recorded a higher prevalence of zoonotic diseases in females (54.88%) than in male sheep (45.12%) in the Savar region of Bangladesh, and Rahman et al. (2024) found a higher prevalence of brucellosis in female sheep than males in Bangladesh. Females may be highly susceptible to diseases than males since they are required to remain in the herd for extended periods of time for reproduction (Kamga et al., 2020).

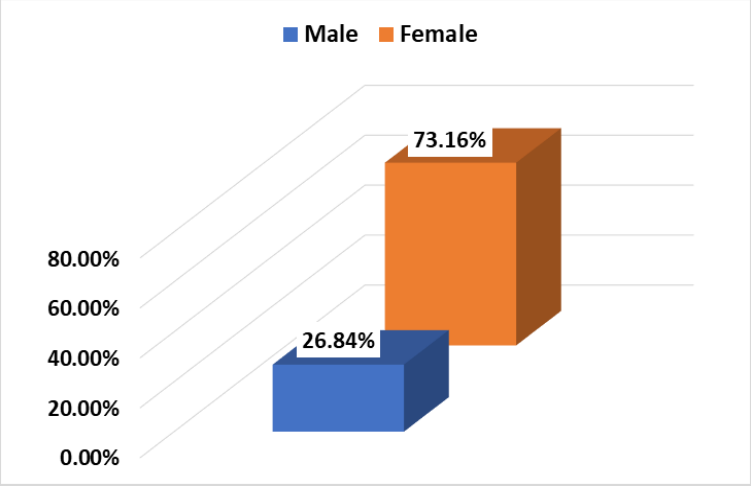

Fig. 6. Prevalence of sheep diseases and disorders by sex

Prevalence of sheep diseases and disorders in different disease categories

Category-wise disease prevalence of sheep was shown in Figure 7, in which most of the cases were non-specific causes that were categorized into the other group (42%), followed by bacterial (28%), parasitic (23%), mechanical (5%), and viral (2%) diseases. In this investigation, authors observed the highest prevalence of non-specific cases (42%) than bacterial cases (28%), while the lowest prevalence was of viral cases (2%). These results almost align with Hossain et al. 2023 recorded the highest rate of bacterial (15.53%) followed by parasitic (11.65%), viral (7.77%), fungal (2.91%), and rickettsial (1.94%) diseases in sheep and Nath et al 2014

observed the highest cases of mixed infection (49%) then followed by the bacterial infection (22%), viral infection (12%) and fungal infection (4%) in case of goats. In the current investigation, authors found parasitic diseases as the second most prevalent disease (28%), and previously, Lucky et al. (2016) recorded almost similar prevalence of bacterial and viral diseases (26.22%) and parasitic diseases (26.58%) in small ruminants. However, Omoike (2006) found a higher percentage of parasitic infection (20%) than bacterial infection (16%) in sheep in Nigeria. This could happen because of the differences in agroecological zones and climatic conditions of the location.

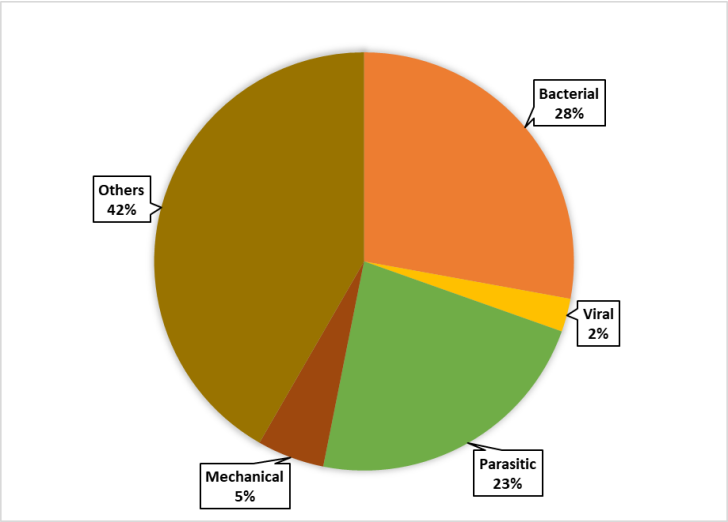

Fig. 7. Prevalence of sheep diseases and disorders in different disease categories

Conclusion

This study concluded that different types of diseases and problems of sheep exist in the coastal area of Bangladesh. A lot of common diseases and disorders seen in sheep during the clinical examination of diseases were enterotoxemia, bloat, retention of placenta, GI parasitic infection, alopecia, mastitis, dermatitis, diarrhea, pneumonia, and PPR. However, the prevalence of diseases and disorders decreased gradually due to regular deworming, dipping, and vaccination by the sheep farmers. Diseases were most prevalent in the winter season in these places. Diseases and disorders differ by the sheep's age and sex. In Bangladesh, good management, feeding, deworming, vaccination, and antimicrobial choice can prevent several sheep diseases and disorders. Finally, these results will aid in the understanding of the age, sex, and season-specific variations in various sheep diseases and disorders in this country and will facilitate the implementation of appropriate preventive measures.

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Data Availability

Upon a reasonable request, the corresponding author will provide the datasets utilized or analyzed for this study.

References

Alam, M. B., Mahmud, T., Khan, S. A., Islam, A., Hai, M. A., and Hassan, M. M. (2018). Occurrence of diseases and disease conditions in cattle and goats at the Upazilla Veterinary Hospital, Debidwar, Comilla. *Journal of Advanced Veterinary and Animal Research*, 5(2), 117-122. https://doi.org/10.5455/javar.2018.e254

Asín, J., Ramírez, G. A., Navarro, M. A., Nyaoke, A. C., Henderson, E. E., Mendonça, F. S., and Uzal, F. A. (2021). Nutritional wasting disorders in sheep. *Animals*, *11*(2), 501. https://doi.org/10.3390/ani11020501

DLS. (2024). Department of Livestock Service. Livestock Economy at a Glance 2023-2024, Ministry of Fisheries and Livestock, Bangladesh. https://dls.gov.bd/site/page/22b1143b-9323-44f8-bfd8-647087828c9b/Livestock-Economy (Accessed on 28 August 2024)

Dey, A. R., Begum, N., Biswas, H., and Alam, M. Z. (2021). Prevalence and factors influencing gastrointestinal parasitic infections in sheep in Bangladesh. *Annals of Parasitology*, 67(2), 187-194. https://doi.org/10.17420/ap6702.328

Fesseha, H., Gebremichael, G., Asefa, I., and Edaso, T. (2023). Study on incidence of lamb morbidity and mortality and associated risk factors in the mixed crop-livestock production system of Gewata District, Kaffa zone, southwestern Ethiopia. *Animal Diseases*, 3(1), 11. https://doi.org/10.1186/s44149-023-00074-y

FAO Statistics. (2023). Food and Agriculture Organization of the United Nations. https://www.fao.org/faostat/en/#data/domains_table (Accessed on 21 August 2024)

Haque, M. N., and Rahman, M. H. (2024). Incidence of common goat diseases and disorders in Bangladesh. *Journal of Research in Veterinary Sciences*, 3(2), 37-47. http://dx.doi.org/10.5455/JRVS.20240523011347

Hossain, H., Islam, M. R., Sajib, M. S. I., Hossain, M. M., Begum, M., and Islam, K. B. M. S. (2023). Prevalence of zoonotic diseases of small ruminants at Savar upazila of Dhaka district: Prevalence of zoonotic diseases of small ruminants. *Bangladesh Journal of Agriculture*, 48(1), 81-91. https://doi.org/10.3329/bjagri.v48i1.66761

Hossain, M. A., Rahman, M. M., and Hashem, M. A. (2023). Productive performances of native sheep in Bangladesh. *Meat Research*, 3(1), 1-7. https://doi.org/10.55002/mr.3.1.43

Hossain, M. A., Sun, M. A., Islam, T., Rahman, M. M., Rahman, M. W., and Hashem, M. A. (2021). Socio-economic characteristics and present scenario of sheep farmers at Sherpur district in Bangladesh. *SAARC Journal of Agriculture,* 19(1), 185-99. https://doi.org/10.3329/sja.v19i1.54789

Kamga, R. M., Silatsa, B. A., Farikou, O., Kuiate, J. R., and Simo, G. (2020). Detection of Brucella antibodies in domestic animals of southern Cameroon: Implications for the control of brucellosis. *Veterinary Medicine and Science*, 6(3), 410-420. https://doi.org/10.1002/vms3.264

Lucky, N. S., Hossain, M. K., Roy, A. C., Haque, M. M., Uddin, A. M., Islam, M. M., and Howlader, M. M. R. (2016). A longitudinal study on clinical diseases and disorders of cattle and goats in Sylhet, Bangladesh. *Journal of Advanced Veterinary and Animal Research*, 3(1), 24-37. https://scholar.google.com/scholar?cluster=15505174774558641466&hl=en&as_sdt=0,5

Mohapatra, A., Shinde, A. K., and Singh, R. (2019). Sheep milk: A pertinent functional food. *Small ruminant research*, 181, 6-11. https://doi.org/10.1016/j.smallrumres.2019.10.002

Munsi, M. N., Ershaduzzaman, M., Rahman, M. M., and Rahman, M. M. (2016). Incidence of clinical diseases and disorders in native sheep at the sheep research farm of Bangladesh Livestock Research Institute, Savar, Dhaka, Bangladesh from 2012 to 2014. *Asian-Australasian Journal of Bioscience and Biotechnology*, 1(1), 37-46. https://doi.org/10.3329/aajbb.v1i1.61528

Nath, T. C., Bhuiyan, M. J. U., Mamun, M. A., Datta, R., Chowdhury, S. K., Hossain, M., and Alam, M. S. (2014). Common infectious diseases of goats in Chittagong district of Bangladesh. *International Journal of Scientific Research in Agricultural Sciences*, 1(3), 43-49. https://scholar.google.com/scholar?cluster=10913777491309336465&hl=en&as_sdt=0,5

Omoike, A. (2006). Prevalence of diseases among sheep and goats in Edo state, Nigeria. *Journal of Agriculture and Social Research*, 6(2), 23-31. https://scholar.google.com/scholar?cluster=9379164890643672380&hl=en&as_sdt=0,5

Poddar, P. R., Begum, N., Alim, M. A., Dey, A. R., Hossain, M. S., and Labony, S. S. (2017). Prevalence of gastrointestinal helminths of sheep in Sherpur, Bangladesh. *Journal of Advanced Veterinary and Animal Research*, 4(3), 274-280. http://doi.org/10.5455/javar.2017.d224

Rahman, M., Chowdhury, S., Adnan, M. R., Rahman, M. U., Sathi, D., Ahmed, M., and Mahfujur, R. M. (2017). Status of diseases and disorders of ruminants in sylhet, Bangladesh. *International Journal of Development Research*, 7(9), 15366-15372. https://scholar.google.com/scholar?cluster=13795503595404120603&hl=en&as_sdt=0,5

Rahman, M. H., Ahmed, E., Haque, M. N., Hassan, M. Z., and Ali, M. Z. (2022). Major respiratory diseases of goat and their epidemiology, prevention and control. *Bangladesh Journal of Livestock Research*, 29(1-2), 1-20. https://doi.org/10.3329/bjlr.v29i1.72031

Rahman, M. H., Akther, S., Ali, M. Z., and Hassan, M. Z. (2020). Incidence of diseases in goats in Bangladesh. *Bangladesh Veterinarian*, 37(1-2), 14-20. https://doi.org/10.3329/bvet.v37i1-2.59180

Rahman, M. H., Akther, S., Haque, M. N., Ali, M. Z., Zihadi, M. A. H., and Rahman, M. Z. (2024). Ovine Brucellosis in Bangladesh: Seroprevalence and its associated risk factors. *Journal of Research in Veterinary Sciences*, 3(1), 28-36. http://dx.doi.org/10.5455/JRVS.20240519053238

Raquib, A., Uddin, M. M., Chowdhury, M. S., Hossain, M. M., and Rahman, M. M. (2020). Occurrence and distribution patterns of the diseases of goat in Dhaka, Bangladesh. *Turkish Journal of Veterinary Research*, 4(2), 51-56. https://scholar.google.com/scholar?cluster=17490958829963691170&hl=en&as_sdt=0,5

Sangma, A., Begum, N., Roy, B. C., and Gani, M. O. (2012). Prevalence of helminth parasites in sheep (Ovis aries) in Tangail district, Bangladesh. *Journal of the Bangladesh Agricultural University*, 10(2), 235-244. https://doi.org/10.3329/jbau.v10i2.14913

Sarker, Y. A., Miah, A. H., Sharif, N., Himel, M. H., Islam, S., Ray, R. C., and Sikder, M. H. (2015). A retrospective study of common diseases at Veterinary Teaching Hospital, Bangladesh Agricultural University, Mymensingh. *Bangladesh Journal of Veterinary Medicine*, 13(2), 55-61. https://doi.org/10.3329/bjvm.v13i2.26629

Skapetas, B., and Kalaitzidou, M. (2013). Current status and perspectives of sheep sector in the world. *Livestock Research for Rural Development*, 29(2), 21. https://scholar.google.com/scholar?cluster=9366532515413099015&hl=en&as_sdt=0,5