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Knowledge level of small ruminant practices by pastoralists in Jammu and Kashmir

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Abstract
A study was conducted to find the knowledge level of pastoralists regarding improved small ruminant practices. The data was collected from 400 pastoralists belonging to Kathua, Jammu, Anantnag and Leh district of Jammu and Kashmir and Ladakh with the help of structured interview schedule containing selected dependent and independent variables, through personal interview technique. Majority of the pastoralists were middle aged, having poor education, engaged in caste occupation and were having marginal landholding and possessed medium herd size of 58 small animals. Further, most of the respondents had medium family size, with average of 6 family members. The social participation and mass media exposure of majority of the respondents were medium. They had poor extension contact. The income of the majority of respondents from livestock rearing was ₹59290 per year and were having 31 years of average experience in livestock rearing. Pastoralists fared well in terms of economic motivation. However, majority had semi-nomadic pastoral system. The marketing system was rather limited. None of the pastoralists had obtained any formal training in improved small ruminant rearing practices. Majority of respondents (57.75%) were having medium level of knowledge (49.86%), whereas, 24 percent had low knowledge (49.27%) and only 18.25 percent respondents had high knowledge level (56.46%). Positive significant association of knowledge with education, occupation, landholding, herd size, social participation, extension contact, mass media exposure, income from livestock rearing, economic motivation, and marketing system was observed. However, negative significant association of knowledge with pastoral system was observed.

Keywords: Pastoralist, knowledge, improved small ruminant rearing practices

Introduction
Pastoralists can be defined as "member of caste or ethnic group with a strong traditional association with livestock-keeping, where a substantial proportion of the group derive over 50 percent of household consumption from the livestock products or their sale and where over 90 percent of animal consumption is from natural pasture or browse and where households are responsible for the full cycle of livestock breeding (Sharma *et al.,* 2003) [1]. Other researcher defined pastoralists as the people, who derive more than 50 percent of their income from livestock and livestock products, while agro-pastoralists are people who derive less than 50 percent of their incomes from livestock and livestock products, while most of it comes from cultivation and who live mostly in dry remote areas. According to a semi-popular magazine, more than 200 tribes, comprising six percent of the country's population, are engaged in pastoralism (Khurana, 1999) [2]. Pastoralists mainly depend on three resources, livestock, pasture and water and for this purpose, they migrate and this is the only way they can survive and sustain the ecological balance of nature.

Pastoralism in the Himalayas is based on transhumant practices and involves cyclic movements from low lands to high lands, to take advantage of seasonally available pastures (Bhasin, 1998) [3]. Transhumance is the regular movement of herds between fixed points to exploit seasonal availability of pastures. In hills, the transhumant pastoralists follow a cyclical migratory pattern from cool highland valleys in summer to warmer lowland valleys in winter. In the terms of ecological adaptations, the two most significant factors for transhumance are seasonal severity of winters, associated with presence of territorial use of highland and lowland pastures. Transhumant agro-pastoralists have regular encampments or stable villages with permanent houses. They often practice subsistence level agriculture at one or the other destinations in summer. They trade their animals and animal products in town markets for grains and other necessities of life, which they do not produce themselves.

Ethnic groups in transhumant category are few and are of low population density in relation to the total land mass. There is low margin of surplus because of low level of technology, little occupational specialization, high participation of women in the economy and highly flexible residence. The emergent pattern of social structure has kinship and functional groups that help in meeting the demands of a migratory mode of production. As all follow the same mode of production, there is little variation in economic level and behavior from one household to another. The relations of economic control, which are legally manifested as property ownership are absent in transhumant societies. In Jammu Kashmir and Ladakh the main pastoral communities, which are involved in small ruminant rearing, are Bakerwal, Chopan, Gaddi, Changpa etc. They are distributed throughout the state. Bakerwals are found in both the Jammu and Kashmir provinces, Chopan in almost every district of the Kashmir province, Gaddis in the Kathua district and Changpas in the Leh district. They are involved in pastoralism and still follow their traditional occupation of rearing animals and their condition still remained unchanged. These pastoral communities have seriously been marginalised due to their ignorance, migratory lifestyle, small population, cultural stereotyping and irrational government policies. They have traditionally been ill treated as less civilized, less productive and more degrading than a settled life style (Dabral and Malik, 2004) [4]. Various pastoral developmental programs planned and implemented over the time, have failed to make significant improvement in the lifestyle of pastoralists, especially in Jammu and Kashmir. A sustainable developmental programme for the upliftment of such pastoral communities should address appropriate income generation by means of livestock productivity enhancement without disturbing their nomadic lifestyle, in absence of other suitable means of development. However, their system of livestock rearing should be understood properly before suggesting the solutions for improvement (Sudan *et al*., 2007) [5]. In this context the present study was planned to assess the knowledge level of pastoralists regarding improved small ruminant practices.

Materials and methods

The present study was conducted in of Jammu & Kashmir and Ladakh. It is a hilly region with total area of 2,22,236 sq. km that sprawls over the western Himalaya and Korakoram mountains between 32.17^0 N and 36.58^0 North latitude and 73.26^0 E and 83.30^0 East longitude. It is surrounded by number of countries i.e. Pakistan in the West, Afghanistan in the Northwest and China in the Northeast. The Jammu region falls in Pir Panchal range which is situated 2000 meters above the sea level. Kashmir region lies totally within the Himalayas surrounded by high hills of Peer Panchal range and Korakoram range (K2). It is interesting to note that the culture, climate and convention vary from region to region. The J&K State has got its importance in many respects. The state is endowed with rich agricultural and mineral resources. It has a very sound horticultural background and huge availability of high altitude alpine and sub alpine pastures. Livestock is an integral part of state agricultural economy and plays a multifaceted role in providing livelihood support to the rural population. The state has four geographical zones of (i) Sub-mountain and semi- mountain plain known as Kandi or dry belt, (ii) the Shivalik ranges, (iii) the high mountain zone constituting the Kashmir valley, Pir Panchal range and its off-shoots including Ramban, Doda, Kishtiwar, Poonch and Rajouri districts and part of Kathua and Udhampur districts and (iv) the middle run of the Indus river comprising Leh and Kargil.

Selection of the districts

The population of pastoralists is more or less concentrated in all the districts of Jammu and Kashmir and Ladakh. Four districts namely Kathua, Jammu, Anantnag, and Leh were selected through purposive sampling technique due to predominant pastoralist population in these districts. Four pastoral communities, Gaddi from Kathua, Bakerwal form Jammu, Chopan from Anantnag and Changpa from Leh, were selected from these districts of Jammu and Kashmir and ladakh.

Selection of villages

A comprehensive list of villages from the selected districts was prepared. Five villages from each district were selected through systematic random sampling technique because systematic sample is spread more evenly over the entire population and is quick, easier and convenient in large populations. Thus, a total of 20 villages were selected from four districts.

Selection of respondents

A list of pastoralists engaged in small ruminant rearing in each village was prepared and respondents were then selected following random sampling method. Twenty respondents from each village were selected, constituting a total sample size of 400 respondents.

Knowledge level of pastoralists regarding improved small ruminant practices

Knowledge of a pastoralist forms an important determinant of individual behaviour. Therefore, it can be conceptualized as the body of understood information possessed by an individual or by a culture. However, we can say it is the part of a person's information, which is in accordance with established facts. Knowledge for the present study was operationalised as a body of understood information with respect to recommended improved small ruminant practices of pastoralists. A schedule to measure respondent's knowledge level regarding improved small ruminant practices was developed using the package of practices by neighbouring universities as 'universe of content'. The schedule was developed using different type of questions i.e. true / false and multiple choice. The items were based on factual information recommended in the latest package of practices. The schedule consisted of four areas i.e. management, feeding, breeding and healthcare. Opinion from faculty members of Faculty of Veterinary Sciences and Animal Husbandry, Shere-e-Kashmir University of Agricultural Sciences and Technology of Jammu was obtained in their respective area of expertise. Based on their opinion and discussion with them certain items were deleted or modified. The final schedule consisted of 15, 16, 17 and 11 items in the areas of management, feeding, breeding and healthcare respectively. Each correct answer was awarded one mark and incorrect answer was awarded zero marks in true / false type of items. For multiple choice items the scoring ranged from 0 – 4 depending upon the accuracy of the response. Maximum possible score for each area was as under.

Maximum possible score for each area was as under

Knowledge area	No. of items	Maximum possible score
Management	15	34
Feeding	16	20
Breeding	17	27
Healthcare	11	28
Total	59	109

Pre-testing of interview schedule

The pre-testing of the interview schedule was done on 25 respondents other than those in the study area. These 25 respondents were not included in the sample size. On the basis of information obtained through pre-testing necessary modifications, additions, deletion and alterations were made to meet the specific requirements of the study.

Collection of data

The data was collected from the study area with the help of interview schedule by using the personal interview technique. The responses obtained were recorded and only one respondent was interviewed at a time, so that others were not influenced by the reply of that particular respondent.

Analysis of the data

The collected data were tabulated and analysed using the software; Statistical Package for the Social Science (SPSS, 16.0). The presentation of data was done to give pertinent, valid and reliable answer to the specific objective. Inferences were drawn in the light of available knowledge and literature. Frequencies, percentage, arithmetic mean, mean percent score, standard deviation were worked out for meaningful interpretation.

Results and Discussion

General background profile of pastoralists

A brief account of the general background profile of the respondents is presented in the table 1. As is evident from the results, majority of respondents were middle aged, the average age being 47 years. The respondents were fairly well distributed on the basis of age, as is indicated by the degree of variance observed (S.D. =13.24). The minimum age of the respondents was 20 years and maximum 85 years, indicating that the pastoralists of all age groups were fairly represented in the study. The education level of majority of respondents was poor, with the average score of 0.97 ± 0.07. Majority of respondents were engaged in caste occupation, with mean value of 1.23± 0.02. Most of pastoralists were marginal famers, as is indicated by landholding mean score 0.97 ± 0.03 and possessed a medium herd size of 58 small animals. Further, majority of respondents had medium family size with an average of 6 members. The social participation of majority of respondents was medium with mean value of 1.37 ± 0.03. The extension contact of majority of respondents was poor with mean score of 8.29 ± 0.09, whereas, majority of respondents had medium mass media exposure, with average score of 6.24 ± 0.10. On the other hand, the income from livestock rearing by the majority of respondents was ₹59290 and the average experience in livestock rearing by the majority of respondents were 31 years, indicating that livestock rearing was their main source of livelihood. Pastoralists fared well in terms of economic motivation with the average score being 9.92 ± 0.07. However, pastoral system of majority of the respondents was semi-nomadic with mean score of 1.86 ± 0.03. The marketing system was fairly average, with mean score of 15.66 ± 0.17. Surprisingly, none of the pastoralists had obtained any formal small ruminant rearing training in the recent past. These findings were in consonance with the results of Choudhary *et al.* (2018) [6], who revealed that majority of the respondents were middle aged with poor education, medium herd size, marginal land holdings and medium source of information. Similar results were earlier reported by Kumar *et al.* (2015) [7], Nipane *et al.* (2016) [8] and Mastanbi *et al.* (2017) [9] and Singh *et al.* (2018) [10]. Bhat (2018) [11] investigated the socio-economic and political conditions of Gujjar and Bakerwals of Jammu and Kashmir and observed that they were mostly dependent on rearing of sheep and goat and literacy rate among Gujjars and Bakerwals was meaningless and insufficient. The primary occupation of this tribe was livestock rearing. Positive significant association of knowledge with education, occupation, land holding, herd size, social participation, extension contact, mass media exposure, income from livestock rearing, economic motivation, and marketing system was observed, whereas, positive insignificant association with age, family size and experience in livestock rearing was observed. However, negative significant relation of knowledge with pastoral system was observed.

Table 1: General background profile of pastoralists

Independent variable	Possible range	Observed range	Mean ± Standard error	Standard deviation	‘ r’ value
Age	-	20-85	47.00±0.66	13.24	0.048
Education	0-6	0-5	0.97± 0.07	1.58	0.475**
Occupation	1-5	1-5	1.23± 0.02	0.52	0.223**
Land holding	0-5	0-3	0.97± 0.03	1.15	0.224**
Herd size	-	8-555	58.00±2.90	58.19	0.243**
Family size	-	2-19	6.00± 0.12	2.43	0.081
Social participation	0-4	0-3	1.37± 0.03	0.74	0.372**
Extension contact	0-32	14-17	8.29± 0.09	1.92	0.422**
Mass media exposure	0-18	2-15	6.24± 0.10	2.001	0.511**
Income from livestock rearing	-	₹5000-300000	59290± 2523.35	50467.05	0.332**
Experience in livestock rearing	-	3-70	31.00± 0.65	13.13	0.043
Economic motivation	0-12	5-12	9.90± 0.07	1.42	0.367**
Pastoral system	1-3	1-3	1.86± 0.03	0.61	-0.186**
Marketing system	0-36	10-23	15.66± 0.17	3.50	0.174**

* *P*<0.05% level of significance

** *P*<0.01% level of significance

The knowledge level of pastoralists regarding improved animal husbandry practices was studied in four components i.e. management, feeding, breeding and healthcare. The scores obtained in the study are presented in the table 2. The average score obtained by the respondents was 50.47 ± 0.89, which means pastoralist had 49.48 percent of knowledge level regarding small ruminant practices (table 2). It might be presumed that approximately half of the improved small ruminant practices were known to the pastoralists. The variation observed in the knowledge level was fairly large with a standard deviation of 5.28 as can be seen from the histogram for knowledge score of respondents (Fig. 1). A closer look at the results revealed that the pastoralists were having knowledge to a lesser extent about improved management practices (42.50%) as compared to the knowledge level about improved feeding practices (56.00%). Further, respondents had 47.78 percent and 55.18 percent knowledge level regarding improved healthcare and breeding practices respectively. However, the differences observed in the extent of variation of knowledge level, in general, did not vary considerably. It might be concluded that the knowledge was lowest for management practices and highest for feeding practices. Similarly, Verma and Sharma (2009) [12] observed that more than half of the respondents possessed medium level of knowledge. Roy and Tiwari (2017) [13] observed that majority of the goat owners had medium level of knowledge about healthcare management practices. Pote *et al.* (2017) [14] found that majority of the goat keepers had knowledge about extensive method of rearing, housing management, goat insurance, duration of feeding of colostrum.

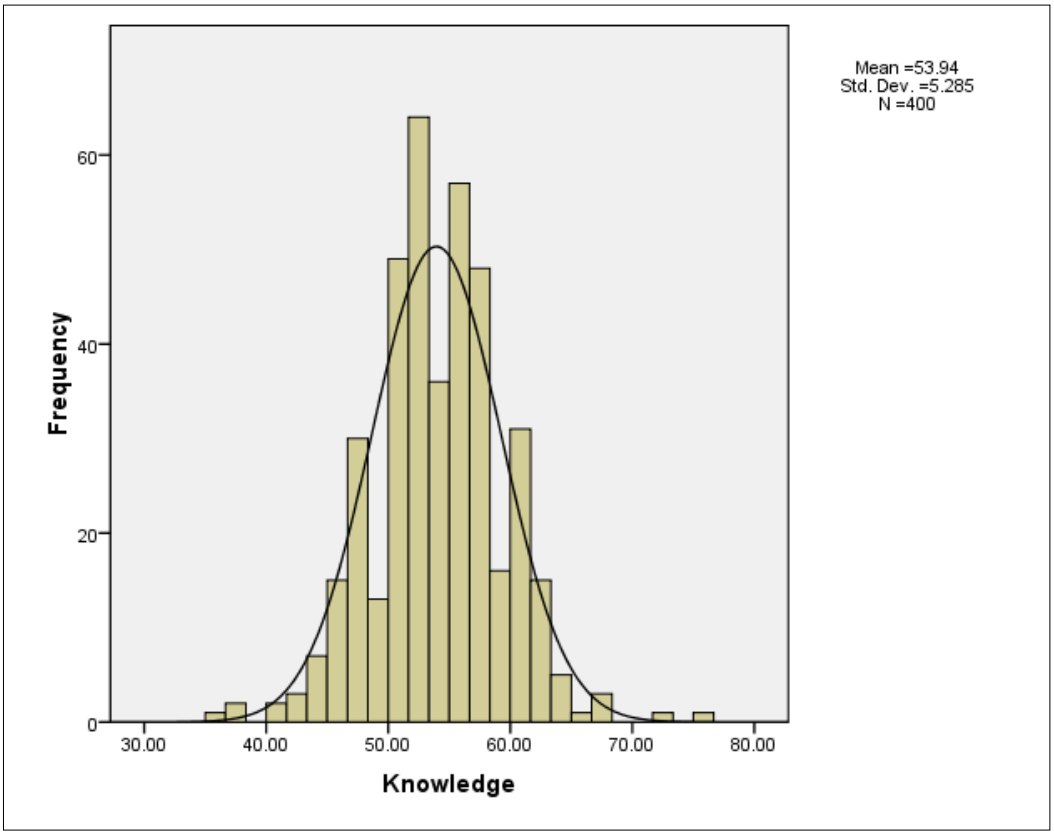

Fig 1: Histogram depicting knowledge scores of respondents

Table 2: Knowledge level of small ruminant practices by the pastoralists

Area of improved small ruminant practices	Possible range	Observed range	Mean ± Standard error	Standard deviation	Percentage
Management practices	0-34	6-22	14.45±0.11	2.38	42.50
Feeding practices	0-20	7-18	11.20±0.08	1.75	56.00
Breeding practices	0-27	9-21	14.90±0.11	2.34	55.18
Healthcare practices	0-28	8-20	13.38±0.08	1.72	47.78
Total of all small ruminant practices	0-109	36-75	53.94±0.26	5.28	49.48

Pastoralists were divided into three categories based on the knowledge scores obtained. As is evident from the results (table 3) majority of respondents (57.75%) were having medium level of knowledge (49.86%), whereas, 24 percent had low knowledge (49.27%) and only 18.25 percent respondents had high knowledge level (56.46%). But there was insignificant difference in knowledge level between the low and medium category. The mean knowledge scores obtained by the respondents of low, medium, and high categories were 53.71 ± 0.27, 54.35 ± 0.14 and 61.54 ± 0.33 respectively. The pastoralists were having low knowledge about improved healthcare practices (41.25%). The three categories of respondents with different knowledge levels were having different adoption scores. Comparatively higher adoption scores were obtained by the respondents having high knowledge regarding small ruminant practices. Thus, it can be hypothesized that increasing the knowledge level of pastoralists regarding small ruminant practices, might influence their adoption. This can successfully be utilized in future extension programmes which should focus on

increasing the knowledge level of respondents. The results were supported by the findings of Khandi *et al.* (2010) [15] who reported that majority of Gujjars (54.00%) had medium level of knowledge and 23 percent each were in low and high knowledge level category. Gujjars had highest knowledge in breeding practices. Similarly, Jeelani *et al.* (2015) [16] revealed that most of the respondents (70.80%) were having medium knowledge level, whereas, 19.20 percent had low and 10 percent had high knowledge level.

Table 3: Classification of the pastoralists based on knowledge scores

Category	Low (36-50)	Medium (51-58)	High (59-85)
Frequency	96 (24%)	231 (57.75%)	73 (18.25%)
Management practices	(Mean score ± SE)	(Mean score ± SE)	(Mean score ± SE)
	14.39±0.12	14.88±0.10	16.72±0.16
Feeding practices	11.08±0.08	11.36±0.08	12.83±0.18
Breeding practices	14.81±0.12	14.83±0.13	17.01±0.22
Healthcare practices	13.42±0.08	13.28±0.10	14.97±0.17
Total score of all practices	53.71±0.27	54.35±0.14	61.54±0.33
Percentage	49.27	49.86	56.46

Conclusion

The study revealed that the average knowledge score was 50.47±0.89, which means that pastoralist had 49.48% of knowledge level regarding small ruminant practices. Majority of respondents (57.75%) were having medium level of knowledge (49.86%), whereas, 24 percent had low knowledge (49.27%) and only 18.25 percent respondents had high knowledge level (56.46%). Pastoralists were having knowledge to a lesser extent about improved management practices (42.50%) when compared to the knowledge level about improved feeding practices (56%). Further, respondents had 47.78% and 55.18 percent knowledge level regarding improved health care and breeding practices respectively. Positive significant association of knowledge with education, occupation, landholding, herd size, social participation, extension contact, mass media exposure, income from livestock rearing, economic motivation, and marketing system was observed. However, negative significant association of knowledge with pastoral system was observed.

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Conflict of interest: The authors declare no conflict of interest.

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