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Awareness Regarding Occupational Health Hazards and Risks of Zoonoses Associated with Livestock Rearing Among Male and Female Workers in Uttar Pradesh

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ABSTRACT

The present study was carried out in the state of Uttar Pradesh. Empirical data were collected personally through an interview schedule to understand the level of awareness of 1080 families (540 women + 540 male workers) covering 54 villages with respect to occupational health hazards and risk of zoonoses in rearing their livestock. Although study revealed significant differences in the level of awareness between male and female respondents, both had gross lack of knowledge of various diseases associated with their work and implications of being infected with zoonotic diseases, and other biological, chemical, physical and psychological health hazards posing serious public health threats. The reason may be partly due to lack of education and exposure regarding safe handling and management of their animals. The study implies that policies and programmes should be made mandatory to be implemented with support of state department of animal husbandry, NGOs, KVKs for raising level of awareness among the livestock owning community. Information may be provided during training and other routine programs by keeping it in syllabus as one of the components of package of practices. It will definitely help in reducing the health risks and other hazards in livestock farming

Keywords: Occupational health hazards, zoonoses.

INTRODUCTION

Livestock-keeping has been recognized as a significant source of food. Although different categories of people are involved in raising livestock, most of them are poor with limited resources and access to services. Despite the clear benefits, there are also various health hazards associated with livestock rearing, for farmers, their families, neighbours and the consumers. People may become infected when they come into contact with excretion and secretions of animals during feeding, stroking or touching animals, and contaminated fomites, and at times sleeping with the animals under the same roof, *etc*. Such handling of livestock is associated with a variety of injuries and illnesses among humans. These hazards, injuries and illnesses are mainly due to poor awareness and knowledge of safe livestock handling and management. As per scientific facts, 60 per cent of human diseases are shared with animals; 75 per cent of emerging diseases are zoonotic and 25 per cent of human infectious disease burdens in least developing countries are zoonotic. The top 13 zoonoses are responsible for at least 2.4 billion cases of illness and 2.2 million deaths every year. The high burdens of zoonotic diseases are associated with poor livestock keepers (Abuja 2013). According to a survey conducted in Abeokuta Southwestern, Nigeria prevalence of 69.6 per cent animal related occupational hazard exposures and 6.5 per cent work related hospitalization were reported and workers were at risk of myriad of occupational specific and non- specific hazards. 14.3 per cent of the respondents have experienced occupational related diseases/sickness. Workers had average to adequate knowledge of zoonoses but poor knowledge of preventive measures. Employers' responsibilities towards prevention and control of occupational hazards were inadequate. The findings in this study have provided a baseline list of hazards from different occupations in the study area for future researches (Awosile *et al.*, 2013). A review of studies on health impact assessment of livestock production in Kampala city, shows a number of potential human health hazards associated with livestock rearing , as perceived by farmers, consumers, and policy makers (Ishagi *et al.,* 2003; Atukunda, 1999; Maxwell and Zziwa, 1992; Maxwell *et al.,* 1998). Hema Tripathi et. al. (2013) found that the total cardiac cost of work and physiological cost of work load of women in performing the activity with the existing traditional tools and equipment was very high.

There is paucity of such information from rural India about the practices followed by livestock owners that could cause various health hazards in humans. Therefore present study was carried out to understand and compile baseline data on the level of awareness of livestock keepers on various sources of health hazards , associated with livestock rearing to identify need based

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interventions for safe handling, reducing the health risks and other hazards in livestock farming.

METHODOLOGY

The present study was carried out by following ex-post facto and exploratory research design in the state of Uttar Pradesh, with geographical area of 2,94,416 sq. kms (about 8.90 per cent of India's total geographical area) With overall population of 56 Million livestock, (20 Million cattle, 19 Million buffaloes, 11 Million goats and 12. 1 Million Poultry).

The state of UP is divided into 18 divisions namely; Agra, Aligarh, Allahabad, Azamgarh, Bareilly, Basti, Chitrakoot, Gonda, Faizabad, Gorakhpur, Jhansi, Kanpur, Lucknow, Meerut, Mirzapur, Moradabad, Saharanpur, Varanasi. Out of these, 9 divisions were selected purposively for data collection to represent the state. Two districts from each division, making a total of 18 districts and then three blocks (a total of 54 blocks) from each of the selected district and one village from each of the selected block, making a total of 54 villages were selected randomly. Twenty livestock owning families (10 males and 10 females) were selected randomly from each of the selected villages with the condition that they should have at least two dairy animals making a total of 1080 families (540 women workers and 540 male workers). One rural family was considered as unit of data collection.

The quantitative data were collected personally through a well designed and pretested interview schedule supplemented with observation and interaction dialogue. Level of awareness among male and female workers in livestock rearing were studied by providing them a set of 13 questions about occupational health hazards and risks. The respondents were asked to rate their answers against three point continuum scores 1, 2 & 3 indicating 'not aware', 'partially aware' and 'fully aware' respectively.

Collected data were compiled, coded, tabulated and analysed using suitable statistical methods in terms of frequency, percentages, mean, chi square and correlation *etc* using MS excel and SPSS to get the results.

RESULTS AND DISCUSSION

Animal workers may be infected when they come into contact with animal dung, saliva, urine etc. directly or indirectly: Table 1 showed that around 67 per cent of the males and 36.67 per cent of female animal workers were not aware about the fact that they may be infected when they come into contact with animal dung, saliva, urine etc directly and indirectly. The level of awareness was found to be significantly higher ($p<0.01$) among the females (52.96%) than in male workers (28.89%).

A sick person working with animals may also be a source for transmitting diseases to animals: More than 71 per cent of the male and 42.67 per cent female workers were not aware about the fact that a sick person working with animals may also be a source for transmitting disease to animals. Thus our data suggests that female workers had significantly better awareness than the male workers. Chi square value.

Improper cleaning of dung and urine may lead to production of parasites / insects in the animal shed which may be source of infection: More than 71 per centof the male workers were partially aware, 14.26 per cent were fully aware and 9.07 per cent were not aware about this fact. Amongst female workers, 55.19 per cent were partially aware, 37.59 per cent were fully aware and 7.22 per cent were not aware about the causes of spreading disease. The awareness level were significantly different between male and female workers (Chi square 81.92, $P<0.01$).

Improper disposal of diseased dead animals having bleeding from mouth, nose ears, vagina etc. may be source of anthrax to humans: More than 57 per cent of the male workers were partially aware, 28.52 per cent were not aware and only 14.07 per cent were fully aware about the source of anthrax to humans whereas 49.63 per cent of the female workers were partially aware, 38.70 per cent were not aware and 11.67 per cent of them were fully aware about the source of infection. Thus male had better awareness than females (Chi quare 15.51) Most of the farm workers were aware about the disease through symptoms only the not by the name of the disease.

Diseased dead animal must be buried at least six feet deep and covered with thick layer of lime: More than 47 per cent of the male workers against the female workers (33.70%) were partially aware about the scientific method of burying of diseased animal. The level of awareness was found to be significantly higher ($P<0.01$) among the males (28.89%) than the females (7.22%).

Dark, humid and inappropriate light in animal shed may be source of tuberculosis: Table 1 shows significant differences ($P<0.01$) between male and female workers with respect to their level of awareness that dark, humid and inappropriate light in animal shed may be source of tuberculosis. More than 56 per cent of male workers were partially aware followed by 28.15 and 15.74 per cent fell under not aware and fully aware category. Amongst

female, 58.33 per cent were not aware about it. The level of awareness was found to be at higher side among male respondents than the females.

Burying of dead foetus, birth fluids placenta *etc*. of aborted animals may prevent infectious diseases: Significant differences (P<0.01) were found between male and female workers with respect to their level of awareness that proper burying of dead foetus, birth fluids and placenta etc may prevent spread of infectious diseases. More than 60 per cent of the male against 46.48 per cent female animal workers had partial information . The level of awareness was found to be higher among male than the female respondents.Vehicles used for carrying dead/diseased animals, mangers, utensils etc. must be cleaned properly using disinfectants: More than 64 per cent of the male and 62.59 per cent female workers were partially aware of this fact. The level of awareness was significantly (P<0.01) lower among female workers than the males. Risks of endo and ectoparasites infestation increase when animal is allowed to bath and drink water from dirty ponds: level of awareness differed significantly (P<0.01) between male and female animal workers with respect to risks of endo and ectoparasitic infestation when animals are allowed to bath and drink water from dirty ponds (Chi square value:122.87). Though level of awareness was low, still it was found to be better amongst males (30.37%) as compared to the female respondents (6.67%).

Diseases can be transmitted to humans via consumption or touching the meat, organs, milk, blood, egg of animals carrying the diseases: 70 per cent of the males compared to 56.30 per cent female workers were not aware that diseases can be transmitted to humans even via consumption or touching the meat, organs, milk, blood, egg of animals carrying the disease. The level of awareness was found to be significantly better(P<0.01) amongst females (35.19%) than the male workers (13.70%).

Scratching / biting of rabid dog may cause rabies in animals and humans: More than 57 per cent of the male workers had partial information, 39.07 per cent were fully aware while 10.74 per cent were not at all aware of the causes of rabies. 55.37 per cent female workers however were partially aware followed by 28.15 per cent (fully aware) and rest 16.48 per cent never came across any such information.Level of awareness between male and female workers revealed significant differences (P<0.01) in this regard .

Table 1 : Genderwise level of awareness among the respondents regarding occupational health hazards and risks in livestock rearing

Do you aware with the following statements	Level of awareness	Male (n=540)		Female (n=540)		Pooled (N=1080)		Chi square test
		F	%	F	%	F	%	
Animal workers may be infected when they come into contact with animal dung, saliva, urine etc directly or indirectly	Not aware	362	67.04	198	36.67	560	51.85	102.085**
	Partially aware	22	4.07	56	10.37	78	7.22	
	Fully aware	156	28.89	286	52.96	442	40.93	
A sick person working with animals may also be a source for transmitting diseases to animals	Not aware	384	71.11	232	42.96	616	57.04	93.791**
	Partially aware	16	2.96	56	10.37	72	6.67	
	Fully aware	140	25.93	252	46.67	392	36.29	
Improper cleaning of dung and urine may lead to production of parasites / insects in the animal shed which may be source of infection	Not aware	49	9.07	39	7.22	88	8.15	81.932**
	Partially aware	414	76.67	298	55.19	712	65.92	
	Fully aware	77	14.26	203	37.59	280	25.93	
Improper disposal of diseased dead animals having bleeding from mouth, nose ears, vagina etc. may be source of anthrax to humans	Not aware	154	28.52	209	38.70	363	33.61	15.513**
	Partially aware	310	57.41	268	49.63	578	53.52	
	Fully aware	76	14.07	63	11.67	139	12.87	
Diseased dead animal must be buried at least six feet deep and covered with thick layer of line	Not aware	126	23.33	319	59.07	445	41.20	168.327**
	Partially aware	258	47.78	182	33.70	440	40.74	
	Fully aware	156	28.89	39	7.22	195	18.06	
Dark, humid and inappropriate light in animal shed may be source of tuberculosis	Not aware	152	28.15	315	58.33	467	43.24	108.329**
	Partially aware	303	56.11	195	36.11	498	46.11	
	Fully aware	85	15.74	30	5.56	115	10.65	

Burying of dead foetus, birth fluids and placenta etc. of aborted animals may prevent infectious diseases	Not aware	125	23.15	234	43.33	359	33.24	52.833**
	Partially aware	326	60.37	251	46.48	577	53.43	
	Fully aware	89	16.48	55	10.19	144	13.33	
Vehicles used for carrying dead/diseased animals, mangers, utensils etc. must be cleaned properly using disinfectants	Not aware	116	21.48	183	33.89	299	27.69	50.19**
	Partially aware	350	64.81	338	62.59	688	63.70	
	Fully aware	74	13.70	19	3.52	93	8.61	
Risks of endo and ectoparasites infestation increases when animal is allowed to bath and drink water from dirty ponds	Not aware	135	25.00	259	47.96	394	36.48	122.876**
	Partially aware	241	44.63	245	45.37	486	45.00	
	Fully aware	164	30.37	36	6.67	200	18.52	
Diseases can be transmitted to humans via consumption or touching the meat, organs, milk, blood, egg of animals carrying the diseases	Not aware	378	70.00	304	56.30	682	63.15	73.765**
	Partially aware	74	13.70	190	35.19	264	24.44	
	Fully aware	88	16.30	46	8.52	134	12.41	
Scratching / biting of rabid dog may cause rabies in animals and humans	Not aware	58	10.74	89	16.48	147	13.61	20.063**
	Partially aware	271	50.19	299	55.37	570	52.78	
	Fully aware	211	39.07	152	28.15	363	33.61	
Marketing of diseased and slaughtered animals/birds/fishes together with the healthy animals in the village market may spread diseases	Not aware	92	17.04	176	32.59	268	24.82	59.087**
	Partially aware	365	67.59	338	62.59	703	65.09	
	Fully aware	83	15.37	26	4.81	109	10.09	
Chances of abortion in pregnant women increases while working with the diseased animals or touching the birth fluid of dead foetus	Not aware	228	42.22	415	76.85	643	59.54	136.537**
	Partially aware	281	52.04	114	21.11	395	36.57	
	Fully aware	31	5.74	11	2.04	42	3.89	

Marketing of diseased and slaughtered animals/ birds/fishes together with the healthy animals in the village market may spread diseases More than 67 per cent of the male and 62.59 per cent female workers were partially aware that marketing of diseased and slaughtered animals/birds/fish together with the healthy animals in the village market may spread disease. The levels of awareness among the male workers were to be higher then the female workers ($P<0.01$). Chances of abortion in pregnant women increases while working with the diseased animals or touching the birth fluid of dead foetus: Significant differences ($P<0.01$) between male and female workers were found with respect to the level of awareness that the chances of abortion increases in pregnant women while working with the diseased animals or touching the birth fluid of dead foetus. More than 52 per cent of the males against 21.11% female workers were partially aware of abortion in pregnant women. The levels of awareness among females (76.85%) were found to be lower than the male (42.22%) workers (Table1).

The data presented in Table 2 showed the district wise analysis regarding level of awareness among the respondents in livestock rearing. The data suggests that the respondents of 08 different districts of Uttar Pradesh differed significantly in their level of awareness for almost all the parameters except for sl no no 07 ie burying of dead foetus, birth fluids and placenta etc. of aborted animals may prevent infectious diseases. Thus there is a need to formulate district wise strategies to raise the level of awareness with respect to occupational health hazards and mitigating strategies among the livestock owning families. Correlation analysis between socio-personal, economic and communication characteristics of respondents with their level of awareness regarding occupational health hazards in livestock rearing

Nine independent variables *viz*., age, annual income, income from livestock, experience in livestock rearing, family size, land holding, livestock holding, yield from milch animals and extension agency contact of the respondents were subjected for correlation analysis with awareness of occupational health hazards and risks in livestock rearing. Table 3 shows a positive correlation between the socio-personal variables of livestock farmers and the level of awareness regarding occupational health hazard. With respect to male workers, annual income ($r=0.133$, $P<0.01$), land holding ($r=0.130$, $P<0.01$), livestock holding ($r=0.179$, $P<0.01$) had significant and positive relationship with awareness about occupational health hazards.

Table 2: District wise analysis regarding level of Awareness among the respondents regarding occupational health hazards and risks in livestock rearing

n=1080

Level of awareness	Bareilly	Moradabad	Agra	Aligarh	Saharanpur	Lucknow	Faizabad	Allahabad	Meerut	Total	Chi square test
Not aware	64	73	57	78	55	66	61	47	59	560	
Aware	51	37	56	34	58	45	50	55	56	442	45.979**
Partially aware	5	10	7	8	7	9	9	18	5	78	
Not aware	71	76	67	82	63	73	66	43	75	616	
Aware	46	38	48	31	52	34	45	54	42	392	76.944**
Partially aware	3	6	5	5	5	13	9	23	3	72	
Not aware	12	16	15	15	11	6	6	0	7	88	
Aware	29	16	23	10	25	35	44	71	27	280	133.237**
Partially aware	79	88	82	95	84	79	70	49	86	712	
Not aware	32	38	47	33	54	48	37	36	38	363	
Aware	14	8	12	9	10	22	17	32	15	139	66.071**
Partially aware	74	74	61	78	56	50	66	52	67	578	
Not aware	42	39	48	39	61	52	57	58	49	445	
Aware	22	18	25	24	18	18	23	24	23	195	37.506*
Partially aware	56	63	47	57	41	50	40	38	48	440	
Not aware	44	50	53	39	56	49	68	63	45	467	
Aware	13	20	17	18	9	13	10	4	11	115	48.617**
Partially aware	63	50	50	63	55	58	42	53	64	498	
Not aware	42	38	42	28	36	36	50	53	34	359	
Aware	14	14	13	15	12	15	16	25	20	144	44.930**
Partially aware	64	68	65	77	72	69	54	42	66	577	
Not aware	28	36	30	31	39	34	30	40	31	299	
Aware	12	12	13	4	8	6	9	14	15	93	29.818^{NS}
Partially aware	80	72	77	85	73	80	81	66	74	688	
Not aware	41	33	34	26	58	50	52	58	42	394	62.881**
Aware	32	24	28	19	18	22	16	14	27	200	
Partially aware	47	63	58	75	44	48	52	48	51	486	
Not aware	81	67	74	76	85	79	74	63	83	682	
Aware	17	25	21	22	7	10	10	9	13	134	58.163**
Partially aware	22	28	25	22	28	31	36	48	24	264	
Not aware	15	12	7	26	26	22	17	2	20	147	
Aware	33	49	51	35	26	37	38	58	36	363	64.302**
Partially aware	72	59	62	59	68	61	65	60	64	570	
Not aware	22	27	29	18	36	42	34	28	32	268	
Aware	13	12	13	5	12	13	15	11	15	109	42.340*
Partially aware	85	81	78	97	72	65	71	81	73	703	
Not aware	65	64	66	64	80	84	76	82	62	643	
Aware	3	8	6	4	3	5	4	5	4	42	37.684*
Partially aware	52	48	48	52	37	31	40	33	54	395	

Awareness statements

1. Animal workers may be infected when they come into contact with animal dung, saliva, urine etc directly or indirectly

2. A sick person working with animals may also be a source for transmitting diseases to animals

3. Improper cleaning of dung and urine may lead to production of parasites / insects in the cow shed which may be source of infection

4. Improper disposal of diseased dead animals having bleeding from mouth, nose ears, vagina etc. may be source of anthrax to humans

5. Diseased dead animal must be buried at least six feet deep and covered with thick layer of lime

6. Dark, humid and inappropriate light in animal shed may be source of tuberculosis

7. Burying of dead foetus birth fluids and placenta etc. of aborted animals may spread of prevent infectious diseases

8. Vehicles used for carrying dead/diseased animals,

mangers, utensils etc. must be cleaned properly using disinfectants

9. Risks of endo and ectoparasites infestation increase when animal is allowed to bath and drink water from dirty ponds

10. Diseases can be transmitted to humans via consumption or touching the meat, organs, milk, blood, egg of animals carrying the diseases

11. Scratching / biting of rabid dog may cause rabies in animals and humans

12. Marketing of diseased and slaughtered animals/ birds/fishes together with the healthy animals in the village market may spread diseases

13. Chances of abortion in pregnant women increases while working with the diseased animals or touching the birth fluid of dead foetus

Table 3: Correlation analysis between socio-personal, economic and communication characteristics of respondents with their levelof awareness regarding occupational health hazards in livestock rearing

Socio-personal, economic and communication characteristics	Correlation coefficient 'r' value		
	Level of awareness among respondents		
	Male	Female	Overall
Age	0.016	0.048	0.087**
Annual income	0.133**	0.121**	0.047*
Income from livestock	0.037	0.025	0.002
Experience in livestock rearing	0.026	0.012	0.035
Family size	0.07	0.056	0.073*
Land holding	0.130**	0.088*	0.074*
Livestock holding	0.179**	0.053	0.084**
Yield from milch animals	0.084	0.001	0.012
Extension agency contact	0.003	0.028	0.002

**** Correlation is significant at the 0.01 level,**
*** Correlation is significant at the 0.05 level.**

With respect to female workers, annual income ($r=0.121$, $P<0.01$) and land holding ($r=0.088$, $p<0.05$) had significant and positive relationship with awareness. Overall, age annual income, family size, land holding and livestock holding had significant and positive relationship with level of awareness about occupational health hazards. The overall correlation coefficient value 'r' was highly significant for the variables like, age , livestock holding , land holding , and family size with level of awareness irrespective of the gender. The higher correlation between age and hazard awareness may be due to the fact that with increasing age livestock farmer gain experience and accumulate some knowledge on hazards through practical experiences or word of mouth or informal discussion with the fellow farmers and occasional exposures to awareness programmes related to livestock related hazards. The variables *viz.*, family size, livestock holding and land holdings were positively and significantly correlated with awareness. In larger family size, probability of getting exposure to information on livestock related hazard was higher and this may help in disseminating information on livestock farming related hazards. Larger land and livestock holding of the farmers might provide great opportunity to participate in social activities, which in turn help the livestock farmers to acquire more information related to occupational health hazards in livestock farming.

CONCLUSION

The results of the study suggest that most rural people irrespective of male or female had inadequate or poor awareness and knowledge that livestock production and consumption can lead to human health risks which include diseases transmitted from livestock to humans. Further, significant differences were found in level of awareness between male and female respondents regarding occupational and zoonotic diseases in livestock rearing. Hence, there is a need to disseminate information extensively on occupational health hazards and zoo notic diseases to rural areas where livestock population exist. Occupational safety and health in livestock rearing is also needed to be addressed with well defined strategy/interventions and must be integrated in the rural development policy with special reference to small scale livestock farming.

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