Original Article

An Assessment of Knowledge Regarding the Risk of Zoonoses and Hygiene Practices among Females with Livestock in South-West Delhi, India: A Cross-Sectional Study

Priya Chinchwadkar, Pradeep Panda

Department of Academic and Research, International Institute of Health Management Research, New Delhi, India

Abstract

Introduction: Globally, India is the largest milk producer with highest population of cattle i.e., 134 million cows and 124 million buffalos, with women accounting for 93 per cent of total employment in dairy production. The Indian subcontinent is one of the four global hot-spots at increased risk for emergence of zoonotic diseases. Health hazards occurring due to lack of awareness about the causes and impact of zoonosis on the public health are significant. In addition, fewer efforts are seen in One-Health programs in India. **Objective:** To assess the knowledge level regarding the risk of zoonoses and hygiene practices among rural female population with livestock. And also to assess the actual status of practices adopted in the small holder dairy farm. **Materials and Methods:** A cross-sectional study was conducted among 60 female populations in peri-urban area of Najafgarh, New Delhi. A structured questionnaire and checklist for observing practicing gaps were used for data collection; Knowledge level was calculated with the help of knowledge scores. Snowball sampling was used. The analysis was done with SPSS-(22). Descriptive statistics, one sample *t*-test, cross tabulation and Chi-square test were used. **Results:** Out of total score (28), the respondents got a maximum mean score of 11. Majority of respondents (75%) had low knowledge of specific zoonotic diseases and there was an observed gap in practice. **Conclusion:** 75% of the respondents had low knowledge on specific zoonotic diseases, hence importance should be given on increasing knowledge about the correct handling of the livestock especially in female population through national-programs and strengthening One-Health efforts.

Keywords: Hygiene practices, knowledge level, One-Health, zoonotic diseases

Introduction

The WHO defines zoonoses as diseases and infections that are naturally transmitted between vertebrate animals and humans.[1] Globally the emergence and re-emergence of zoonoses and its potentially harmful effect on human health are gaining attention.[2] Researchers have found that globally 13 diseases called zoonosis are responsible for 2.2 million human deaths every year.[3] These diseases may be transmitted to the farmers with livestock during processing, production and handling of food products of animal origin.[1]

Developing countries such as India suffers from the triple burden of diseases; the unfinished work of communicable diseases, the noncommunicable diseases, and emergence of new pathogens and overstretched health infrastructure.[1] In addition, the role of global warming and climate change is affecting the biodiversity and distribution of animals resulting in emergence of zoonoses.[4] Favourable environmental, demographic and socio-economic factors further put India at a risk of epidemics of emerging infections. India is a land of villages with 71.6% population living in rural area, whose main occupation is agriculture and agro-related occupations.[5] Worldwide, India is the largest milk producer with the highest population of cattle, i.e., 134 million cows and 124 million buffalos.[1] According to the Public Health Foundation of India (PHFI), the Indian subcontinent has been identified

Access this article online

Quick Response Code:

Website: www.ijcm.org.in

DOI: 10.4103/ijcm.IJCM_382_19

Address for correspondence: Prof. Pradeep Panda, International Institute of Health Management Research, Plot No. 3, HAF Pocket, Sector-18A, Phase-II, Dwarka, New Delhi - 110 075, India. E-mail: pradeeppanda@iihmr.org

How to cite this article: Chinchwadkar P, Panda P. An assessment of knowledge regarding the risk of zoonoses and hygiene practices among females with livestock in South-West Delhi, India: A cross-sectional study. Indian J Community Med 2020;45:S38-42.

Received: 04-09-19; **Accepted:** 25-02-20

as one of the four global hot-spots at increased risk for the emergence of new infectious diseases.[6] These diseases have an ill effect on the animal production, leading to slow growth and less milk production; leading to an economic impact on the social wellbeing of the rural community. About 75 million women as against 15 million men are engaged in dairying in rural India.[1,7-9] The role of female population is important in the handling of the livestock as they are actively involved in various aspects of dairy farming activities.[1]

The WHO conducted a program on rabies in India resulting in a reduction of cases to a certain extent, also the economic losses came down.[9] In a study, it was found that awareness, teaching and training programs for dairy farmers can improve disease control in animals and reduce the public health risk of milk-borne zoonosis. The study conducted in Tanzania discussed that public health promotion on education and inter-disciplinary One-Health collaboration between vets, public health practitioners and policy makers should result in a more efficient and effective joint approach to the diagnosis and control of zoonoses.[8] While, in a study conducted by PHFI, it was found that currently there are inadequate efforts for One-Health and with the emergence and re-emergence of pathogens in India, there is an immediate need for strengthening One-Health programs.[10] Lack of knowledge regarding these diseases have an impact on both the animal and human health; also there is a positive association in the occurrence of zoonotic diseases and lack of knowledge about it.[11]

Hence, understanding the public knowledge and awareness about the disease can be helpful in devising disease awareness and control programs for it.[12,13] The current study assesses the knowledge regarding the risk of zoonoses and the hygiene practices being followed among females who are engaged in livestock. It will be of significance for the decision makers, veterinarians, general practitioners, and nongovernmental organizations in creating awareness among the females.

Materials and Methods

In order to achieve the study objectives, quantitative method was used for data collection and analysis. The study was conducted through various processes including brainstorming discussions to establish the study objectives, selection of area, and the study methodology. A preliminary literature review was also conducted during the early phase of the study.

Study area and subjects

The current study was carried out in peri-urban area of South-West area, New Delhi. South West Delhi has a population of 2,292,363 (2011 census), and an area of 420 km^2. Administratively, the district is divided into three subdivisions, Dwarka, Najafgarh and Kapas Hera, out of it, Najafgarh is the division which has mix of urban, peri-urban and rural areas. The study was carried out in Ujwa village of Najafgarh division. The target population consists of female population from different age groups, education level, and diverse experience in livestock handling.

Inclusion criteria

The study had one inclusion criteria: (i) one female from the household who is involved in the major handling of the livestock.

Sampling method

The snowball sampling method was used for gaining the desired number. The technique was followed in two steps: (1) identification of 1–2 participants from the area. (2) These participants were asked to give information about the similar subjects and so on; this was continued till all the 60 house-holds with livestock were identified and included in the study.

Data collection method

The data collection was done from Ujwa village. After the selection of the participant, informed consent was taken prior to data collection; those who did not agree were excluded.

Structured questionnaire was used as a tool for data collection. It had 3 broad sections, i.e., demographics, awareness about zoonotic diseases and hygiene practices including general hygiene practices and specific hygiene practices. The responses were in Likert scale type which was considered as ordinal variable. The questionnaire was translated from English to Hindi (local language) and retranslated. The questionnaire was pretested and then finalized after incorporating suggestions from the respondents. Similarly, a checklist was prepared. The checklist had points for the ideal way of handling livestock along with the marks/scores for their compliance.

Data analysis

The collected data were coded and analyzed with the help of IBM SPSS Statistics for windows, version 24 (IBM Corp, Armonk, NY, USA) software. Descriptive statistics and cross tabulation were mainly used on data. Association and regression were tested on the data.

Knowledge scores were calculated for risk of zoonosis knowledge on hygiene practices, its association with the age groups, and with the standard of living of the study population. Observations on the hygiene practices were also calculated.

Ethical considerations

The study was reviewed and approved by the ethics committee of the International Institute of Health Management Research. Confidentiality and importance of the responses was conveyed to the participants. Potential participants were informed that the study was designed to understand the hygiene practices and knowledge about the zoonotic diseases. Informed consent was obtained from all participants before participation. Participants were informed that they could voluntarily accept or refuse to participate in the study at any stage; also, it was assured that the collection of the data was for research purposes only.

Results

Demographic characteristics

All the respondents in the sample were female. The response rate in the sample was 58/60 (96.6%). The majority of the

respondents (25, 41.7%) were uneducated while 23 (38.3%) were educated up to primary level. The majority of the respondents 49/58 (81.7%) were homemaker while only 9/58 (15%) were working. According to Kuppuswamy score for socioeconomic status, most of the respondents 23 (38.3%) belonged to lower middle class, followed by middle upper middle (21, 35%).

The assessment of knowledge regarding hygiene practices and zoonotic diseases

The majority of the respondents 32 (53.3%) disagreed that few diseases can be transferred from man to animal or vice-versa, while the majority did not have the knowledge 45/56 (75%) about diseases transferred from animals to humans, while no respondent had knowledge of specific zoonotic diseases.

It was observed that 50/58 (83.3%) of respondents washed their hands every time before milking. The respondents actively helped the cattle during reproduction (49/58; 81.7%) but did not wear any protective gloves (54/58; 90%). Majority of the respondents did not apply any medication on udder after the milking stops (57/58; 95%), while all the respondents washed udder before milking (58/58; 96.7%).

Knowledge score and hygiene practices related to zoonoses

The total score for the questions was 28. The questions with responses like "Yes or No" were given score 1 for correct response and 0 otherwise; the questions with frequency like "Everyday, Occasional, and Never," a score of 2 was given for correct response and 0 otherwise. The range of the score varied from 0 (minimum) to 28 (maximum). Scores <18 were considered as low score and >18 as high score.

Knowledge toward general and specific practices about zoonotic diseases

The respondents were asked about the general hygiene practices and scored accordingly. The highest score was 9 while the minimum being 0. The respondents were asked questions about hand washing before serving food, after touching animals, disposing waste, etc., In addition, knowledge about specific practices which are to be carried out to prevent zoonoses was assessed [Table 1]. Although they were not aware about the zoonotic disease *per se*, they had an adequate knowledge about the practices to be followed specific to zoonotic diseases. It was found that 27 respondents got into low score category, i.e., <18, but their total mean score was toward higher range (15), and 31 respondents belonged to high score category.

The assessment of relationship between level of education and knowledge

Cross-tabulation and Chi-square test were used to find out if increase in the education level results in better knowledge about hygiene practices [Table 2].

The Fisher exact test value for the association between education and knowledge of practices was obtained as 2.028 with a Significant probability more than 0.05 (i.e., 35). On the evidence of this data, there would appear to be no doubt that there is an association between education and knowledge of practices in the population from which these sample respondents were drawn. However, it can be seen that the strength of the association between the variables is weak-positive (Cramer's V = 0.190) may be due to rural and female population. In addition, the result cannot be generalized in larger population due to a probability more than 0.05. While the mean knowledge score was found to be highest in the highest education category in the sample, i.e., 20 while it was less in respondents who were not at all educated, i.e., 17.

The assessment of actual practices (observation) viz-a-viz knowledge

The respondents were assessed based on the actual way of practicing while dealing with livestock. They were assessed on points like hand washing after touching animals, before milking, washing udder before and after milking, whether they wore different cloths while working, nails were short and clean, the animal shelter was clean and free of cow-dung, etc., [Table 3].

Similarly, their knowledge about the same aspects was tested against the observation; it was found that the total score of the knowledge questions which were asked came out to be 7.7/10 while on observing the same practices, there was gap found in the knowledge and practices. The respondents got a score of 6.6/10 [Table 4].

The descriptive statistics, as shown in Table 4, shows the overall mean for the respondents was 1.01; this shows there

Table 1: Total knowledge score about hygiene practices related to zoonotic diseases

Knowledge about practices	Obtained mean score	Expected total score
General practices	7	9
Specific practices	11	18
Total score	18	28

Table 2: Crosstab and Fisher's exact test

	Knowledge score		Total
	Low	High	
Highest level of education			
None	14	11	25
Primary incomplete	10	13	23
Secondary incomplete	3	7	10
Total	27	21	58

Fisher's exact test: 2.028 (P=0.35). Cramer'sV (0.190)

Table 3: Mean: Knowledge and observation (n=58)

	Mean±SD
Pair 1	
Knowledge	7.71±1.32
Observation	6.69±1.22

SD: Standard deviation

Table 4: Paired *t*-test: Knowledge and observation

	Paired differences			Significant
	Mean±SD	*t*	Df	
Knowledge - observation	1.02±1.65	4.70	57	0.000*

*Statistically significant at 95% confidence level ($P<0.05$). SD: Standard deviation

was a gap between the respondents' knowledge about the practices and the actual practice. A paired *t*-test was done to see the significance, the knowledge and the actual practices should ideally have the same value but there was a difference observed. It indicates that the respondents in the sample did not follow in practice the knowledge which they have. The results of the *t*-test were found to be statistically significant. The result is considered statistically significant if the *P* value is less than the chosen alpha level (0.05).

Discussion

The interaction between animals and men is an old concept, and the relationship is intimate; hence, the awareness, knowledge about the zoonotic becomes critical to understand. In the current study, it was found that the knowledge level of majority of respondents (75%) about diseases transferred from animal to man, i.e., zoonotic diseases was low. One of the important steps to control the spread of disease is caring of animals. To minimize the risk of zoonoses use of protective clothing, appropriate vaccination becomes important.[14]

It is evident that the risk of development of a zoonotic disease can be reduced to an extent by early recognition of infected animals, proper animal handling, and, most importantly, personal hygiene.[15] In the study, it was found that the respondents scored maximum 7/9 in general hygiene practices, while in the specific practices related to zoonoses their score was 11/19.

Majority of the respondents were unaware about zoonoses; the respondents (45/56; 75%) did not have knowledge that few diseases can be transferred from animals to man and vice-versa; this was supported by studies of other authors.[16] When they were asked about the details of the zoonotic diseases, many of them could not answer the question 42/47 (70%) while those who knew say it was some infection 5/47 (8%). This may be due to less awareness about these diseases while infections are visible, other reasons could be lack of awareness camps, health facilities, low trainings on the handling of animals, and low literacy might be the contributing factors. Similar results were found in other studies as well.[1,17,18]

Education had an impact on the knowledge levels of the respondents, they have a positive relation, but their strength of the relation is weak.

The respondents were also observed about the actual practice of handling the animals against their knowledge, it was observed that the respondents correctly answered the questions which were asked but did not follow while actually practicing it with livestock. This gap may be due to ignorance, thoughts like "nothing happened over generations in family."

Conclusion

There is a need to increase the knowledge about zoonoses; hence, awareness camps should be held in the community. Majority of the respondents 75% lacked knowledge about zoonotic diseases, while 8% who perceived that they are aware; thought zoonotic disease was some infection but lacked specific knowledge. On-the other hand 53.3% respondents disagreed that diseases can be transferred from animal to humans and vice-versa. Hence, the study suggests that One-Health approach should be applied while dealing with zoonoses, as other stakeholders majorly, veterinary doctors hold a major role in bringing a change in the safe handling of the livestock. Although the government is taking efforts on few diseases through different national programs by organizing animal health check-up camps, vaccinations, etc., but importance should be given on increasing the knowledge and conveying the importance of correct practicing, especially to female population who plays one of the crucial roles in educating the family.

Financial support and sponsorship

Fellowship granted under Research Capacity Grant Programme (RCBP) of Public Health Foundation of India (PHFI) to the fellow supported by International Development Research Centre, Canada grant (No.107344–001).

Conflicts of interest

There are no conflicts of interest.

References

1. Hundal JS, Sodhi SS, Gupta A, Singh J, Chahal US. Awareness, knowledge, and risks of zoonotic diseases among livestock farmers in Punjab. Vet World 2016;9:186-91.
2. Quigley MA. Commentary: Shifting burden of disease – Epidemiological transition in India. Int J Epidemiol 2006;35:1530-1.
3. Agencies Commit to Strengthening One Health Research Capacities at Consultation Organised by RCZI. Available from: http://perimilk.phfi.org/agencies-commit-to-strengthening-one-health-research-capacities-at-consultation-organised-by-rczi/. [Last accessed on 2019 Feb 12].
4. Kumar R, Singh SP, Savalia CV. Overview of emerging zoonoses in India: Areas of concern. J Trop Dis 2015;3:165.
5. Dikid T, Jain SK, Sharma A, Kumar A, Narain JP. Emerging and re-emerging infections in India: An overview. Indian J Med Res 2013;138:19-31.
6. Himanshu H, Stern N. India and an Indian Village: 50 Years of Economic Development in Palanpur, Asia Research Centre Working Paper; 2011.
7. Message from Chairperson, RCZI. Available from: http://zoonoses.phfi.org/pdf/RCZI_Newsletter_Jan-Mar.pdf. [Last accessed on 2017 Mar 31].
8. Jeanna B. Live Science Managing Editor; 2012. Available from: http://www.livescience.com/21426-global-Zoonoses-diseases-hotspots.html. [Last accessed on 2019 Mar 03].
9. Sundaram KV, Moni M, Mrityunjay M. Natural Resources Management and Livelihood Security. New Delhi, Concept Publishing Company: 2004.
10. Lahoti SR, Chole SR, Rathi NS. Role of Women in Dairy Farming.

Vol. 65; 2012.
11. WHO. Rabies Control in India: A Need to Close the Gap between Research and Policy. WHO; 2015. Available from: http://www.who.int/bulletin/volumes/93/2/14-140723/en/. [Last accessed on 2017 Apr 08].
12. Swai ES, Schoonman L, Daborn CJ. Knowledge and attitude towards zoonoses among animal health workers and livestock keepers in Arusha and Tanga, Tanzania. Tanzan J Health Res 2010;12:280-6.
13. Asokan GV, Asokan V, Tharyan P. One health national programme across species on zoonoses: A call to the developing world. Infect Ecol Epidemiol 2011;1:10.3402/iee.v1i0.8293. doi:10.3402/iee.v1i0.8293.
14. Preventing Zoonoses, Department of Agriculture and Fisheries, Queensland Government. Available form: https://www.daf.qld.gov.au/animal-industries/animal-health-and-diseases/a-z-list/preventing-zoonoses. [Last accessed on 2019 Apr 08].
15. Weese JS, Peregrine AS, Armstrong J. Occupational health and safety in small animal veterinary practice: Part I–nonparasitic zoonotic diseases. Can Vet J 2002;43:631-6.
16. Stanly T, Gilson N, Mizeck C, Jacob M, Ndukum JA, Steffi W. Risk, knowledge and preventive measures of smallholder dairy farmers in northern Malawi with regard to zoonotic brucellosis and bovine tuberculosis. The Onderstepoort journal of veterinary research. 2014;81:E1-6.10.4102/ojvr.v81i1.594.
17. Babu AJ, Ramya P, Rao LV, Swetha CS, Sudhanthiramani SS, Venkateswara RA. A study on the awareness and knowledge of zoonotic diseases among the public in and around Proddatur -YSR Kadapa district, Andhra Pradesh, India. Int J Rec Sci Res 2015;67:5131-8.
18. Munyeme M, Muma JB, Munang'andu HM, Kankya C, Skjerve E, Tryland M. Cattle owners' awareness of bovine tuberculosis in high and low prevalence settings of the wildlife-livestock interface areas in Zambia. BMC Vet Res 2010;6:21.