Original Research Article

Knowledge, attitude and practice related to Avian influenza among poultry workers of Kathmandu, Nepal

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ABSTRACT

Background: Avian influenza is a threat to global health. This study aims to assess the knowledge, attitudes and practices related to avian influenza among poultry workers in Kathmandu, Nepal.
Methods: This is a qualitative cross sectional study done among poultry workers and owners of poultry farms in Kathmandu valley from February 2019 to June 2019 with a face-to-face interview. Data was analysed in the Statistical package of the social sciences (SPSS) version 20.
Results: Out of the 100 respondents, 70% were male. 5% were illiterate. 96% of them had knowledge that avian influenza is transferred from uncooked poultry, 57% of them had knowledge regarding symptoms of avian influenza. 57% of them also had knowledge regarding availability of vaccine against the disease with television and newspapers being major sources of information. Among them, 93% applied proper disposal practice regarding poultry wastes, 83% applied masks and boot covers for poultry rearing and 90% maintained hand hygiene before and after coming in contact with poultry.
Conclusions: This study highlighted the knowledge among poultry workers about avian influenza, its symptoms and good practices for prevention of its transmission. Television and newspapers appeared to be the most effective means for imparting knowledge regarding avian influenza. Specific age groups should be targeted with appropriate interventions to improve the practices for better prevention of avian influenza.

Keywords: Attitude, Avian influenza, Knowledge, Nepal, Practice

INTRODUCTION

Avian influenza (AI) is a type-A influenza virus belonging to the Orthomyxoviridae family. Type-A influenza theoretically contains thousands of different antigenic subtypes, because of the combination between the main virion antigens, haemagglutinin (HA) and neuraminidase (NA) (Abolnik, 2014). WHO's monitoring data and many other relevant studies depicted that AI could transmit from birds to people but not vice versa [Perdue, Swanye, 2005]. Therefore, controlling AI in poultry is the first step in diminishing risks to humans. Highly pathogenic avian influenza A H5N1 virus was first isolated from and categorized in a domestic goose in Guangdong province, China, in 1996 [Duan, et al. 2008] and subsequent outbreaks have been reported in domestic poultry, wild birds, and humans in more than 60 countries [Olsen, et al. 2006; Durand, et al. 2015; World

Organisation for Animal Health 2015]. The spread of highly pathogenic avian influenza A H5N1 virus in poultry populations surges the risk of human infections [Tian, et al. 2015; Chen, et al. 2005; Li, et al. 2014; Xu, et al. 1999]. The first reported case of human illness caused by H5N1 infection ensued in May, 1997, in Hong Kong, China, with a total of 18 cases and six deaths [Shortridge,1999; Subbarao, et al. 1998; Chan, 2002; Claas, et al.1998]. Two cases of H5N1 infection in people who had a history of travel to southern China were reported in February, 2003, in Hong Kong after an apparent 5-year absence of infection [Peiris, et al. 2004]. Human cases of H5N1 infection with high mortality were subsequently detected in Southeast Asia following the pattern of spread and persistence of the virus in poultry [Beigel, et al. 2005; Abdel-Ghafar, et al. 2008]. In early 2006, the Government of Nepal established the Avian Influenza Control Project (AICP) and endorsed a Joint Health and Agriculture National Avian Influenza and Influenza Pandemic Preparedness and Response Plan (NAIIPPRP) [Government of Nepal 2007, Government of Nepal 2008] which placed a particular importance on preventative behaviours of poultry workers as well as the knowledge and attitudes which initiates such practices. A mass media campaign informing about risks and motivating for protective behaviours had been started already soon after AI hit Asia in 2003 and was strengthened after it had reached Nepal in early 2008. Nepal faced the first localized outbreak of highly pathogenic AI among poultry in January 2009, followed by a second outbreak in another area in February of the same year [World Health Organisation 2005, UN Office for the Coordination of Humanitarian Affairs (IRIN) 2011] but without human cases being registered [World Health Organisation 2011]. In Nepal, the report on first hit of H5N1 was confirmed in January 16, 2013 in Jhapa, Eastern Nepal [Chaudhary 2013]. The government announced Bhaktapur as a bird flu crisis-hit zone on 15th August 2013. In total, 1.56 million units of chicken and more than 1.20 million units of eggs were destroyed in Kathmandu Valley, Chitwan, Kavre and Hetauda [thehimalayantimes 2013]. In 2013, the veterinary authorities reported nine outbreaks of the HPAI in the central region of Bagmati that included Bhaktapur and Kathmandu [Pandey, Pahwa, 2013]. Nepal had its first human casualty from H5N1 virus in March 2019, a 24-year-old male, with it being the first AI human infection globally since September 2017 [Centers for Disease Control 2019].

This study aims to explore the knowledge, attitude and practices related to avian influenza among poultry care takers and to grasp general idea on disease preventive approach from people concerned with poultry farming.

METHODS

A research team of medical students and teachers conducted this qualitative cross-sectional study to understand avian influenza, its transmission and perspective of the poultry care takers towards AI. We conducted this survey in Kathmandu valley in three different sites namely Bhimdunga, Ramkot and Mulpani. We collected data from February 2019 to June 2019. We selected three different areas assuming the perception of people to be different. The study was carried out among the poultry workers and poultry farm owners.

Data Collection: The study population consisted of 100 adults aged 18 to 75 years who either owned the farm or were the workers of the farm selected. The sample was selected by clustered random sampling. All the selected subjects were interviewed face-to-face with the structured questionnaire after consent was taken. The poultry farms were selected on simple random basis.

Data analysis: The data was taken in 4 different domains; Knowledge, Attitude, Practices on avian influenza and the demographic data. All the data were entered in Statistical Package for the Social Sciences (SPSS) version 20 and MS-Excel version 13 to analyse according to the objective of the study and related themes.

RESULTS

Out of 100 respondents, 70% were male and 30% were female. Only 5% were illiterate, 11% knew to read and write but never got any academic degree and 59% of the respondents had completed their secondary level of education at the time of survey as shown in Figure 1.
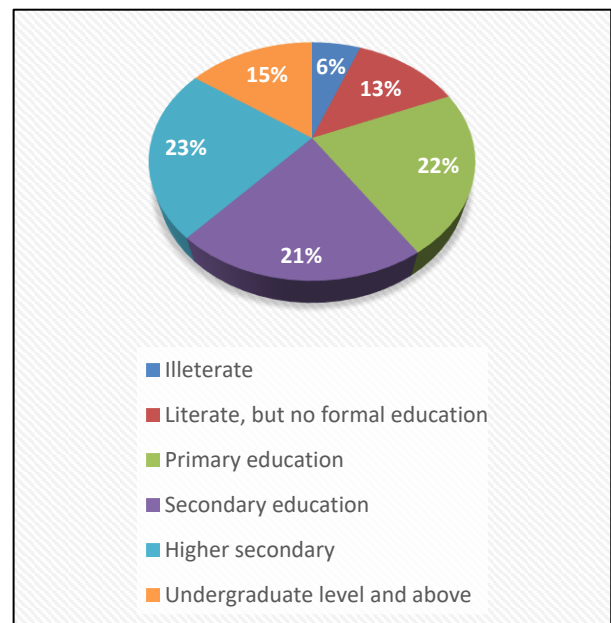

Figure 1: Education level of respondents.

Out of 100 respondents, 17% had taken up poultry farming as their main occupation while 1% were employed as poultry workers. People from other fields of occupation were also involved in poultry farming as 31% were farmers, 22% were students, 11% were housewives, followed by 16% who were engaged in government
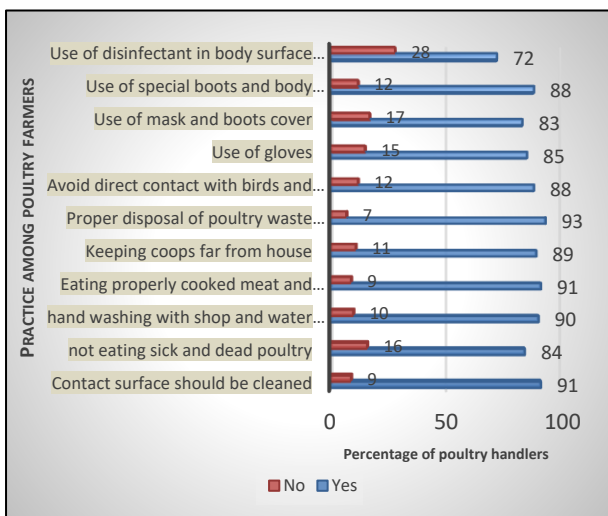
services and 2% were retired government officials (Table 1).

Table 1: People engaged in poultry farming from different occupations.

| Occupation	Percentage
Poultry farmer	17.0
Housewife	11.0
Student	22.0
Farming	31.0
Government Service	16.0
Poultry workers	1.0
Retired government officials	2.0
Total	100.0
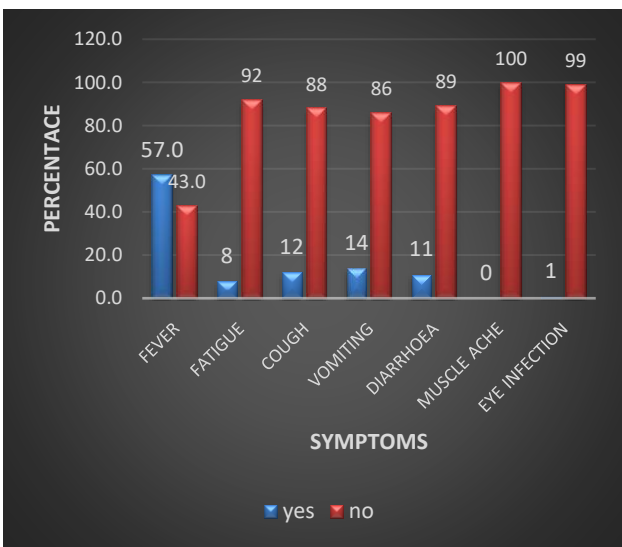
Figure 2: Knowledge on symptoms of AI among respondents.


Figure 3: Practice among poultry farmers.

When asked about the mode of transmission of AI, 96% said that avian influenza is transferred from the uncooked poultry whereas 4% did not suppose it could get transferred from uncooked poultry. Similarly, 69% believed that AI was transmitted by eating uncooked egg. Also, 93% of the respondents thought AI would get transferred by direct contact with infected poultry. 17% assumed that AI would not get transferred from direct contact with dead poultry. 71% of the respondents thought that AI could not be transmitted by droplets whereas 29% believed it is transmitted by droplet infection. Only 64 % of the respondents suspected that it is transferred from person-to-person.
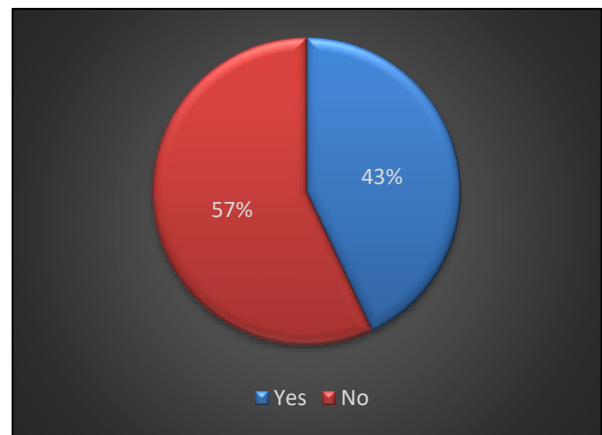

Figure 4: Knowledge on availability of vaccines among respondents.
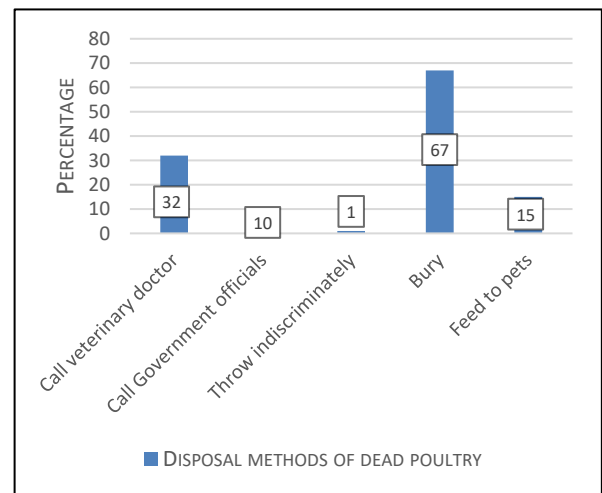
Figure 5: Disposal method of dead poultry.

When the respondents were asked about the symptoms present in AI, 57% replied that fever is present while 43% didn't think fever as a symptom. Only 8% considered fatigue as a symptom of AI, 12% were certain that cough is present, 14% believed that vomiting occurs, 11% supposed that diarrhoea occurred in AI, whereas only 1% said that there is eye irritation and none of the respondents regarded muscle ache as a symptom (Figure 2).

When asked about their practice in poultry farm, it was found that 93% applied proper disposal practices for poultry wastes and litters, 88% used special boots and body garments, 85% used gloves, 83% used masks and boots cover and 90% adopted proper hand washing techniques before and after coming in contact with poultry. Also, 72% respondents used disinfectants on body surface as well as utensils after coming in contact with poultry (Figure 3).
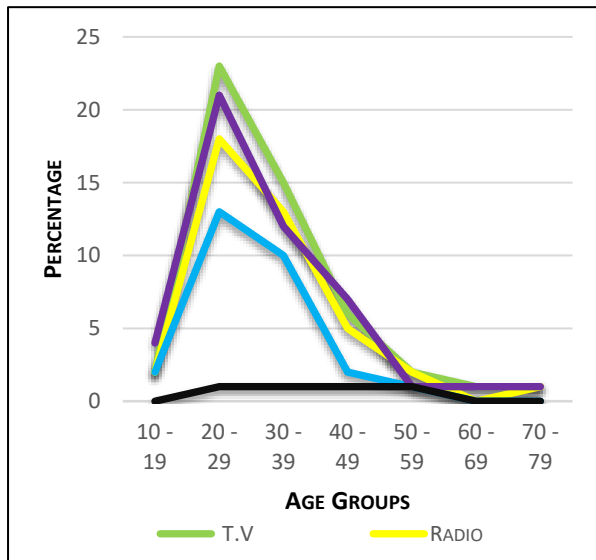
Figure 6: Sources of information about AI.

When asked to the respondents whether there is any kind of vaccine available in the market against AI, 57 % of the respondents replied that there is a vaccine available, while 43% assumed that there is no vaccine available against AI (Figure 4).

Out of 100 respondents, when asked how they disposed the dead poultry, 67% replied that they buried the dead poultry whereas 32% called the veterinary doctors for disposal, 10% called government officials and 15% fed the dead poultry to their pets whereas only 1% threw it indiscriminately (Figure 5).

Age groups from (20-29) and (30-39) years were found to have gained knowledge about AI from Television (23% and 15%), friends (21% and 12%), radio (18% and 13%) and newspaper (13% and 10%) respectively. According to the response of participants analysed, health professionals were found to be most ineffective in imparting knowledge about AI (Figure 6).

DISCUSSION

Avian influenza outbreak can occur in a setting of poultry farming. WHO's monitoring data and many other relevant studies depicted the transmission of AI from birds to humans [Perdue, Swayne, 2005]. Therefore, the first step in breaking the chain of transmission to humans is limiting AI in poultry. This has been aided by

awareness program in poultry holders about the necessary precautions to be taken and early intervention of the disease.

The bird migration was possibly the cause for the outbreak in our country. Lai et al suggested that the geographical extent of human H5N1 cases has expanded from East Asia to Southeast Asia, possibly related to global spread of the virus via bird migration.[23,35]

The outbreak occurred in winter season in Nepal consistent to following studies. Human H5N1 infections exhibited seasonal variations, related to the cooler season from December to March and across diverse climate zones in the northern hemisphere, which might associate with the migration patterns of wild birds and the activity of the virus in winter or cooler seasons [Olsen, et al. 2006; Chen, et al. 2005; Mathur, et al. 2014]. Investigators of a 2015 study found that the timing of H5N1 outbreaks and viral migrations in Asia were closely associated with bird migration networks [World Organisation for Animal Health, 2015].

The knowledge among the poultry farmers about symptoms and availability of vaccines as shown by our study points towards the possibility of rapid diagnosis and effective therapeutic intervention of AI. Prompt diagnosis and early therapeutic intervention should be contemplated for all H5N1 cases [WHO 2007, Adisasmito, et al. 2010; Chan, et al. 2012], nevertheless antiviral resistance continues to receive attention and continued supervision is needed [Govorkova, et al. 2013]. The availability of antivirals and vaccines should be considered in advance in the event of an H5N1 pandemic [Trombetta, et al. 2015].

Nepal, a country belonging to Asian continent and having people involved in commercial poultry farms, could be a threat for the AI outbreak. Majority of the outbreaks, which are included in the systematic review by Chatziprodromidou et al., originated from commercial poultry farms (56.1%). Additionally, Asia was the prevalent continent regarding the geographical extent of outbreaks [Chatziprodromidou, et al. 2018].

Wang et al. revealed that environmental conditions (open water sources, infections on nearby farms), keeping other livestock on the same farm and not disinfecting the farm were the main risk factors for AI infection on poultry farms [Wang, et al. 2014]. However, most of the respondents in our study are literate and thus can be assumed to have insight about environmental conditions and disinfections. This thereby, can control the frequency of outbreaks provided the knowledge in them is applied practically. Farm administration factors such as confinement, shared equipment and biosecurity (except disinfection of farm) did not show any substantial associations with AI infection [Wang, et al. 2014]. However, the former information was not obtained from our respondents.

Almost everyone knew about the significance of washing hands with soap and water. This finding is consistent with studies on poultry workers in other countries which similarly found hand washing to be by far the best known practice [Abdullahi, Oguntunde 2010; Fatiregun, Saani, 2008]. Majority of our respondents had higher rates of knowledge about face masks, boot covers and cleaning procedures consistent to other studies [Fatiregun, Saani, 2008]. Analysis of the factors which were associated with knowledge about protection showed that TV and newspapers played an important role. Those who received information about AI via TV and newspapers were able to name more preventive behaviours than those without that kind of exposure which was in line with results shown by other studies [Fatiregun, Saani, 2008, Barennes, et al.2010]. This finding definitely indicates a beneficial effect of the Nepali mass media campaign. Neupane et al. in a study at Rupandehi district of Nepal showed that only half of the respondents mentioned face masks as an option and only few knew about special boots or boot covers and body suits. In addition to it, only about one fourth named a basic procedure such as washing and disinfecting surfaces and utensils [Neupane, et al. 2012]. However, contrasting to aforementioned study, majority of our respondents had knowledge about face masks, special boots and disinfectants. This result can be interpreted in the sense that our study was conducted in the Kathmandu valley, a developed place than Rupandehi district and the people are comparatively literate with increased access to Television and newspapers.

Most of the people had good knowledge regarding mode of transmission of AI such as uncooked poultry (96%), uncooked eggs (69%), direct contact with infected (93%) or dead poultry (83%). According to a study done in Myanmar, two third of interviewed household had knowledge on mode of transmission, one third had knowledge about symptoms of Avian Influenza on human and half were aware of source of pathogen [MMRD Research Service]. However, there was found to be gap in knowledge about preventive measures important to decrease the disease burden in the community. Even among the poultry workers with good knowledge about preventive measures, practice of such measures were not applied either due to economic constraints leading to lack of proper material resources or due to ignorance.

Our study has some limitations. One is the cross-sectional study design which proscribes drawing causal conclusions about the relationships between some of the variables, such as knowledge and practices. To mention another, self-report on practices are mostly susceptible to recall bias and social desirability tendencies. The face-to-face-interview situation, while enabling full response-rates on all variables as well as participation of poultry workers who lack reading or writing abilities, might have furthermore intensified this type of bias in assessing attitudes and behaviours.

CONCLUSION

It is very crucial for the poultry handlers to know about avian influenza and practice the techniques that can work as barrier for transmission of infection to the general public as it could decrease the burden on hospitals as well as economic burden of the country. This study highlights the knowledge gap among poultry workers regarding AI. Poultry owners and workers have the primary role in the chain of web of transmission and this study suggests that awareness programs, especially about the cause of transmission, measures to be taken for prevention of transmission and handling of poultry after death with or without a known cause, should be conducted. These programs should focus specially on the working age group because they will benefit most out of it, whereas older and younger age groups should be targeted with different kinds of programs. The study also draws attention to promote better knowledge for adaptation of better practice of the recommended precautionary measures for future prevention of the disease transmission and preparedness to combat the disease.

ACKNOWLEDGEMENTS

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