

Awareness of Zoonotic Diseases among the Bachelor of Science New Entrants at the Open University of Sri Lanka in 2020

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Authors' contributions

This work was carried out in collaboration among all authors. Author VK designed the survey questionnaire, data collection, statistical analysis and wrote the first draft of the manuscript. Author SF did the data analysis of the study. Author UJ managed the literature searches. Author CJ designed the study, literature searches and correction of final manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Global attention towards zoonotic diseases has been oriented with the emergence of the COVID-19 pandemic in 2020 as they are infectious diseases that can be transmitted from animals to humans, and they pose a significant threat to public health. This study draws on the awareness of a group of new BSc degree registrants (N=267) at The Open University of Sri Lanka in 2020 about common zoonotic diseases. A cross-sectional study was employed for the participants in a virtual orientation session in December 2020 using a structured online questionnaire. Pearson Chi-square test (χ^2)

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was used evaluate statistical significance at $p < 0.05$. The survey reveals that from the total respondents, 89.9% were aware of zoonotic diseases in humans by animals, 77.9% are aware that zoonotic diseases can be transmitted to humans by direct contact with infected animals and 75.3% knew that zoonotic diseases can be transmitted by eating raw meat of infected animals. Further, 82.4% and 86.1% of respondents agreed that zoonotic diseases could be treated and prevented while 85.4% agreed that zoonotic diseases could be controlled. The majority of the respondents were aware of Rabies, Covid 19, Malaria, Dengue fever and SARS as zoonotic diseases and a higher proportion of female respondents identified Hepatitis E as a zoonotic disease. Bovine tuberculosis was identified by students who studied biological sciences compared to other streams. Respondents below 24 years of age identified Anthrax and Leptospirosis, SARS and Trichinellosis as zoonotic diseases than other age categories. Students in suburban areas had a higher tendency to identify Ebola virus disease, Giardiasis, and Hepatitis E as zoonotic diseases. Urban and suburban students had a higher tendency to wash their hands thoroughly after petting the animals. Pet owners only identified Giardiasis as a zoonotic disease and agreed that avoiding direct contact with animals, avoidance of rearing pets indoors and discarding pet faeces in a proper place as good practices to avoid the transmission of zoonoses. Most of the respondents agreed that zoonotic diseases could be prevented by avoiding eating raw meat, avoiding eating unwashed fresh fruits and vegetables, avoiding direct contact with animals, avoiding rearing pets indoors, regular vaccination of pets, proper discharge of animal faeces, washing the hands thoroughly after petting the animals. Overall, this study revealed that the level of awareness about zoonotic diseases among the new BSc registrants was satisfactory. It is inferred that the students could be more educated about the preventive and control measures for zoonotic diseases. It is expected that students will develop essential life skills that are required for the prevention and control of diseases.

Keywords: Zoonoses; cross-sectional study; e-questionnaire; BSc undergraduates; distance learners.

1. INTRODUCTION

The emergence of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) in 2019 has expanded the scientific inquiry into zoonoses. Zoonoses represent 60% of emerging infectious diseases worldwide [1]. The World Health Organization (WHO) defined zoonoses as those diseases transmitted between people and vertebrate animals [2]. Zoonotic pathogens including, viruses, bacteria, fungi, or parasites may emerge from different species of animal reservoirs and spread to a wider geographical range [3,4,5,6].

Zoonoses are one of the major global challenges which cause devastating effects on public health. In addition to COVID-19, recurring outbreaks of common zoonotic diseases such as severe acute respiratory syndrome (SARS), malaria, dengue fever, avian influenza (H5N1, H7N9), Ebola virus disease (EVD), and Nipah virus have caused millions of deaths and significant economic loss worldwide. It also impairs livestock productivity and imposes huge burden on the economy and society [2].

The recurrence of the outbreak of zoonotic diseases may be attributed to human activities. Unprecedented population growth, land-use

modification for urbanisation, agricultural change, and change in food pattern accounts for the emergence and re-emerging of zoonotic diseases [1]. Destruction of natural habitats of animals due to urbanization and climate change increases the risk of zoonotic diseases by increasing the contact between wild animals and humans. Also, climatic change influences the dynamics of the host, pathogen, and their interaction and facilitates the emergence and spread of zoonotic diseases [7]. Further, culinary traditions such as the consumption of wildlife meat can contribute to infectious disease emergence [8]. Collectively these factors may favour the transmission of zoonotic diseases to humans from animals and spread very quickly as demonstrated by the ongoing coronavirus (COVID-19) infection.

Asia Pacific region has been identified as the epicentre for the emergence of zoonotic diseases such as COVID-19 and SARS in the People's Republic of China (PRC) in 2019 and 2002, respectively, Nipah virus in Malaysia in 1999 and Bangladesh in 2001 (Bordier and Roger, 2013). Recently, the Indian subcontinent has been identified as one of the four global hot spots at increased risk for the emergence of new infectious diseases [9]. Sri Lanka located in the Indian subcontinent is also at elevated risk of the

emergence and re-emergence of zoonoses due to its high mammal & bird diversity and their interaction with humans. Rabies, Leptospirosis, dengue fever, Japanese encephalitis (JE), chikungunya, [10], and recent COVID 19 are major viral zoonoses that have been recognized by the public health services of Sri Lanka. In addition to viral zoonoses, there is a growing concern in Sri Lanka with the emergence of several parasitic zoonoses [11].

Globally, the impacts of zoonotic diseases are primarily reduced by focusing on quarantine, vaccine, and drug development [12] at the post-infection levels. However, the devastating effect of the current pandemic emphasizes a shift from a reactionary to a preventive approach to extenuating the impacts of zoonoses. Lack of knowledge and awareness of zoonotic diseases implies the main hindrance to prevention measures. Hence, awareness of zoonoses at all levels of society is imperative to lower the risk of transmission.

The university student communities represent a unique cohort that includes young individuals in a country with ample health literacy. This group can be empowered to make appropriate lifestyle changes to reduce the transmission of zoonoses. The level of awareness of zoonoses among the university student population is crucial in understanding the knowledge gap and may imply the need for education on zoonoses at the university level. Especially the Open and distance learning universities where the student population is diverse in their age, employability, and educational status may provide a better cohort to investigate the awareness, knowledge, and attitudes toward zoonotic diseases.

The Open University of Sri Lanka (OUSL) is only the state university in Sri Lanka where students may pursue further education solely through the Open and Distance Learning (ODL) mode. It serves a large student population spread throughout the country who had limited higher education opportunities at conventional universities [13]. The OUSL has six faculties and the Faculty of Natural Sciences offers the Bachelor of Science (BSc) degree programme. Every year over 1500 students spread over the country register for the BSc degree offered by the OUSL. Students who have followed their secondary education in the science stream and have fulfilled the basic entry qualification can register for the BSc degree programme. Hence, it is expected that these BSc undergraduates may have a basic understanding of zoonoses. In this

light, the present cross-sectional study was conducted to evaluate the awareness, knowledge, and attitudes on common zoonotic diseases among the new registrants of the BSc degree programme at OUSL in 2020. It is anticipated that this study emphasizes the need for health education for students on common zoonotic diseases at the early stages of their degree programme.

2. METHODOLOGY

2.1 Study Design, Setting, and Participants

A cross-sectional study design was employed for a cohort of 692 new BSc registrants who participated in the virtual orientation program known as Empowerment For Independent Learning (EFIL) held in December 2020 at the Open University of Sri Lanka. The set of students registered for the BSc degree programme at OUSL have fulfilled their university entrance qualification with at least three minimum passes in G.C.E A/L in the science stream (Secondary education level).

2.2 Survey Instrument

Data was collected using a structured and self-administered online questionnaire. The questionnaire was prepared based on information provided on the World Health Organisation (WHO), and Centers for Diseases Control (CDC) websites. It consisted of both open and closed-ended questions, and it was structured into four sections of questions that covered the 1) demographic characteristics of the respondent (age, sex, marital status, place of residence, occupation, and stream of education), 2) awareness of zoonoses and transmission, 3) knowledge on types of zoonoses (28 viral, bacterial, and parasitic zoonoses) and 4) Attitudes and practices for prevention of zoonoses. The questionnaire was prepared in English and was reviewed by the panel of experts in the Department of Zoology, OUSL.

2.3 Data Collection

Data were collected by using the self-administered online questionnaire emailed to students as a google form at the end of the virtual orientation programme held in December 2020. Due to the complete lockdown of Sri Lanka due to COVID-19, pandemic questionnaires were sent only by email. Ethical approval was not obtained for the study as it was a questionnaire

survey and according to the institutional requirement, informed consent was obtained. It was an anonymous survey that took about 8-10 min to complete. In the first part of the questionnaire, the objective of the study was explained. It was further highlighted that their participation is voluntary and confidential.

2.4 Data Analysis

The data collected were properly coded and entered into a Microsoft Excel spreadsheet, which was entered later on into SPSS version 20, SPSS Inc. Chicago. The data were divided into four sub-sections: demographics, knowledge, practices, and awareness; and descriptive analyses were performed. The independent variables were tested for significance using the Pearson chi-square test (χ^2). The $p < 0.05$ was selected as a significant value.

2.5 Availability of Data and Materials

Data will be shared upon request by the readers.

3. RESULTS AND DISCUSSION

3.1 Demographic Characteristics of Participants

A total of 267 respondents participated in this study. The demographic characteristics of respondents are summarized in Table 1. Of the 267 respondents majority were represented by female students (83.5%). Among the participants, 183 (68.5%), 64 (24.0%), 15 (5.6%), 3 (1.1%) and 2 (0.7%) students were less than 24 years, within 25 and 29 years, within 30 and 34 years, within 35 to 39 years and 40 and 49 years old, respectively. Only 26 respondents were married (9.7%) while others were single (90.3%). Eighty % (80%) of the respondents were students (unemployed) while 17.2% and 3.4% were teachers and administrative occupations, respectively. Further, 87.3% of the respondents have enrolled in biological science, 6.0% in the computer science stream 0.7% in the agriculture stream, and 0.4% in the physical science stream. Respondents were from mainly urban (38.6%), semi-urban (34.1%), and rural (27.3%) areas. Among the respondents, 56.9% were pet owners.

Since the university provides education through several regional centres and study centres all around the country there is a comparative larger student community in OUSL with a variety of demographic characteristics than in other

conventional universities in Sri Lanka. The distance education mode provides students to do their studies while they are employed in different types of occupations. The open education system provides them the opportunity to obtain higher education without restricting themselves to their age. These reasons give diversity to the student body with their demographic characteristics such as their hometown, occupation, age limit, marital status and gender. The female student body is comparatively higher regardless of their age, marital status and occupation than the male student body due to the convenience of committing time to education with distance education. According to the results, the majority of respondents were aware that zoonotic diseases are transmitted to humans by animals. Among the respondents students in this survey showed a satisfactory level of sense of the fact of zoonotic diseases can be transmitted to humans by direct contact with infected animals which may cause most of their awareness of those facts that zoonotic diseases can be treated, prevented and controlled.

3.2 Awareness of Zoonoses

A vast majority of BSc registrants (89.9%) knew that zoonotic diseases are transmitted from animals to people. Among the six facts about the general information about zoonoses were correctly acknowledged with percentages ranging between 89.9% to 75.3% by students (Table 2). However, demographic characteristics of participants such as age, gender, demographic location, educational qualification, and presence of pets at home have not influenced their general awareness of zoonoses (Table 3). Among the respondents students in this survey showed a satisfactory level of sense of the fact of zoonotic diseases can be transmitted to humans by direct contact with infected animals (77.9%) which may cause most of their awareness of those facts that zoonotic diseases can be treated (82.4%), prevented (86.1%) and controlled (85.4%).

It was noted that respondents in general were tuned to acknowledge that zoonotic diseases can be prevented by avoiding eating raw meat, avoiding eating unwashed fresh fruits and vegetables, avoiding direct contact with animals, avoiding rearing pets indoors, regular vaccination of pets, proper discharge of animal faeces, washing the hands thoroughly after petting the animals as preventive measures to avoid zoonoses. However, respondents seem to be less aware of rearing pets indoors.

It is interesting to notice that more than 75.3% of the respondents knew that zoonotic diseases can be transmitted by eating the raw meat of infected animals. There is a high risk in the consumption of raw meat and raw milk as it may have a high possibility of zoonotic disease transmission such as bovine tuberculosis [14]. Therefore, it is a satisfactory result to observe that the B.Sc. students are aware of this particular fact as they have a greater possibility in employed in dairy farming and agriculture in near future with the hope that they may imply their knowledge to prevent and control the zoonotic disease transmission. Generally, in Sri Lanka, the consumption of raw meat is not a deep-rooted culture that may have given traditional knowledge on food habits to the general student body in the means of the prevention of disease transmission via food. However, it is suggested to take steps to educate students, especially in science education about zoonotic disease types, and disease transmission via food in detail since

food habit is one of the easiest methods for zoonotic pathogens to be transmitted.

3.3 Knowledge of Types of Zoonoses

The knowledge of the students regarding zoonotic diseases is represented by their ability to identify the diseases mentioned herein as zoonotic or not (Fig. 1). The proportion of respondents who recognized diseases included in the questionnaire as zoonoses was variable. The highest-ranked diseases were Rabies (79.8%), COVID 19 (70.0%), Malaria (65.9%), Dengue fever (65.5%) and SARS (64.4%) (Fig. 1). Least identified zoonoses were Listeria infection (24.0%), Toxoplasmosis (25.1%), Toxocariasis (25.1%) and Cryptosporidiosis (25.5) (Fig. 1). According to the results, participants were less aware of parasitic zoonoses (Fig. 1). The recognition of COVID-19 as a zoonotic disease was expected as the survey was conducted in the recent year of the COVID-19 outbreak.

Table 1. Demographic characteristics of respondents

Demographic variable	Category	N (%)
Age group	<24 years	183 (68.5)
	25-29 years	64 (24.0)
	30-34 years	15 (5.6)
	35-39 years	3 (1.1)
	40-49 years	2 (0.7)
Gender	Male	44 (16.5)
	Female	223 (83.5)
Marital status	Single	241 (90.3)
	Married	26 (9.7)
Occupation	Student	184 (68.9)
	Teaching	46 (17.2)
	Agricultural sector	1 (0.4)
	IT related	3 (1.1)
	Medical laboratory	1 (0.4)
	Administrative	9 (3.4)
	Finance	1 (0.4)
	Technical officer	1 (0.4)
	Other	21 (7.9)
Stream of G.C.E A/Ls	Biological sciences	233 (87.3)
	Computer science	16 (6.0)
	Agriculture	2 (0.7)
	Physical science	1 (0.4)
	Other	15 (5.6)
Demographic location	Urban	103 (38.6)
	Suburban	91 (34.1)
	Rural	73 (27.3)
Pet owners	Yes	152 (56.9)
	No	115 (43.1)

Table 2. Awareness of students on general information about zoonoses

General information about zoonoses	Yes % (n)	No % (n)	Unsure % (n)
Zoonotic diseases are transmitted from animals to people	89.9 (240)	3.4 (9)	6.7 (18)
Zoonotic diseases can be transmitted to humans by direct contact with infected animals	77.9 (208)	7.1 (19)	15.0 (40)
The zoonotic disease can be transmitted by eating raw meat of infected animals	75.3 (201)	8.6 (23)	16.1 (43)
Zoonotic diseases can be treated	82.4 (220)	1.5 (4)	16.1 (43)
Zoonotic diseases can be prevented	86.1 (230)	4.5 (12)	9.4 (25)
Zoonotic diseases can be controlled	85.4 (228)	4.5 (12)	10.1 (27)

Table 3. Chi-square analysis, demonstrating the general awareness of zoonoses among participants according to their age, gender, demographic location, educational qualification and presence of pets at home

Variable	P value				
	Sex (male versus female)	Age (years)	Demographic location (urban, sub-urban versus rural)	Educational qualification	Presence of pets at home
General Information					
Zoonotic diseases are transmitted from animals to people	0.381	0.877	0.235	0.252	0.284
Zoonotic diseases can be transmitted to human by direct contact with infected animals	0.220	0.782	0.917	0.983	0.092
The zoonotic disease can be transmitted by eating raw meat of infected animals	0.288	0.174	0.975	0.301	0.652
Zoonotic disease can be treated	0.667	0.968	0.909	0.478	0.670
Zoonotic disease can be prevented	0.209	0.673	0.153	0.333	0.394
Zoonotic disease can be controlled	0.970	0.682	0.817	0.313	0.542

A higher proportion of female students (39.0%) than male students (5.2%) identified Hepatitis E as a zoonotic disease. Bovine tuberculosis ($p=0.036$) was identified as a zoonotic disease by biological sciences students who selected other streams. This could be due to the knowledge they have obtained from secondary education. Respondents below 24 years of age identified Anthrax and Leptospirosis, SARS and Trichinellosis as zoonotic diseases than other age categories. When considering the demographic location (urban, suburban, rural), students in suburban areas had a higher tendency to identify Ebola, Giardiasis, and Hepatitis E as zoonotic diseases. Urban and suburban students had a higher tendency to wash their hands thoroughly after petting the

animals. Giardiasis was the only zoonotic disease that was identified by pet owners in the respondents.

Secondary education may have played a key role in the awareness of zoonoses for biological science students as they could identify Bovine tuberculosis as a zoonotic disease. According to the results, it shows that responded students under the age category below 24 years have identified several zoonotic diseases such as Anthrax, Leptospirosis, SARS and Trichinellosis as zoonotic diseases than other age categories. This could be suggested due to their freshly acquired knowledge from their secondary education and as this generation is closer to web-based information sources in addition to the

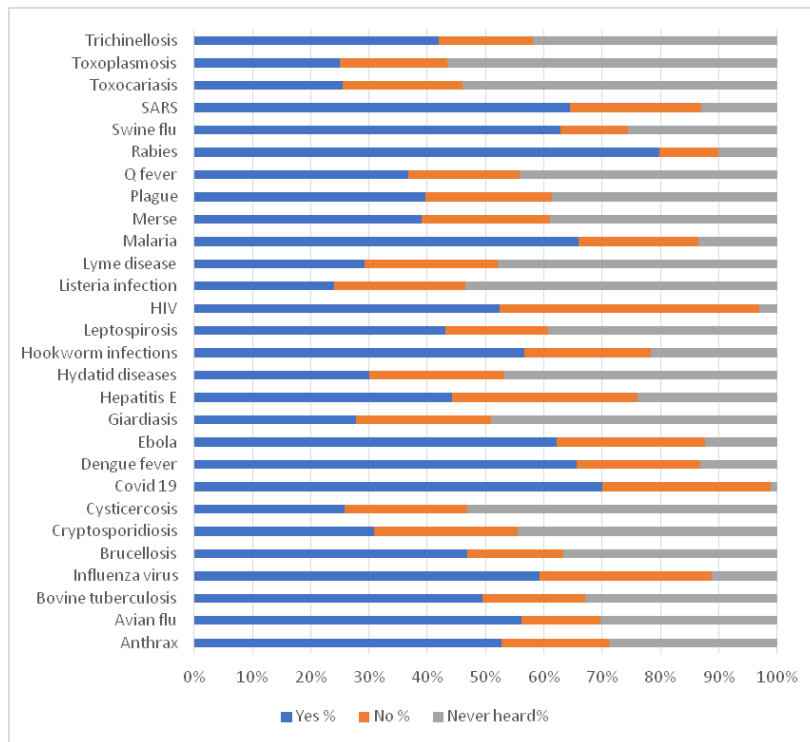


Fig. 1. Frequency distribution of identification of Zoonotic disease

traditional sources of information such as books and newspaper articles. It was noted that students in suburban areas had a higher tendency to identify Ebola, Giardiasis, and Hepatitis E as zoonotic diseases. Urban and suburban students had a higher tendency to wash their hands thoroughly after petting the animals. Since there was a relation between the knowledge of zoonotic disease types among students from suburban areas, they may be more aware of being protected from disease transmission from animals. Generally, urban and suburban households tend to have pets inside their houses which may eventually lead to developing habits to prevent getting contaminated with faeces and other dirt of pets.

3.4 Attitudes and Practices toward Prevention of Zoonosis

According to the survey, respondents agreed that zoonotic diseases can be prevented by avoiding eating raw meat (75.3%), avoiding eating unwashed fresh fruits and vegetables (85.0%) avoiding direct contact with animals (67.0%), avoiding rearing pets indoors (63.7 %), regular vaccination of pets (90.6%), proper discharge of animal faeces (76.0%), wash the hands thoroughly after petting the animals (84.8%), respectively. The survey results revealed that the

overall attitudes and practices required to prevent zoonosis are also satisfactory among the respondents. However, respondents seem to be less aware of rearing pets indoors.

The analysis revealed that females compared with non-pet owners, pet owners agreed that avoiding direct contact with animals, avoidance of rearing pets indoors, and discarding pet faeces in a proper place as good practices to avoid the transmission of zoonoses. Pet owners appeared to be educated by the veterinary practitioners or they must have obtained information from other sources.

Of the total number of respondents, 56.9% of them were pet owners and the only disease identified as a zoonotic by them was Giardiasis. When the pet owners and non-pet owners were compared according to the given ten facts on preventive methods of zoonotic diseases, significantly pet owners agreed with facts that avoiding direct contact with animals, avoidance of rearing pets indoors and discarding pet faeces in a proper place as good practices to avoid the transmission of zoonoses. Given the clinical importance and impact of zoonotic pathogens affecting pets, public education is crucial for reducing risk exposure in both humans and companion animals [15].

Table 4. Chi-square analysis, demonstrating the knowledge of types of zoonotic diseases participants according to their age, gender, demographic location, educational qualification and presence of pets at home

Variable	P value				
	Sex (male versus female)	Age (years)	Demographic location (urban, sub-urban versus rural)	Educational Qualification	Presence of pets at home
Zoonotic diseases type					
Anthrax	0.963	<0.05*	0.324	0.591	0.436
Avian flu	0.669	0.064	0.154	0.789	0.416
Bovine tuberculosis	0.296	0.466	0.614	<0.05*	0.621
Influenza virus	0.093	0.605	0.811	0.837	0.120
Brucellosis	0.958	0.378	0.644	0.092	0.209
Cryptosporidiosis	0.915	0.094	0.468	0.768	0.060
Cysticercosis	0.484	0.854	0.148	0.293	0.091
Covid 19	0.708	0.627	0.672	0.862	0.205
Dengue fever	0.094	0.196	0.506	0.886	0.438
Ebola	0.571	0.936	<0.05*	0.898	0.438
Giardiasis	0.438	0.595	<0.05*	0.259	<0.05*
Hepatitis E	<0.05*	0.413	<0.05*	0.631	0.076
Hydatid diseases	0.245	0.652	0.317	0.279	0.792
Hookworm infections	0.235	0.097	0.502	0.712	0.755
Leptospirosis	0.985	<0.05*	0.211	0.275	0.195
HIV	0.231	0.480	0.064	0.188	0.175
Listeria infection	0.074	0.306	0.052	0.431	0.185
Lyme disease	0.203	0.283	0.066	0.489	0.197
Malaria	0.104	0.548	0.801	0.802	0.317
Merse	0.752	0.761	0.177	0.239	0.405
Plague	0.065	0.199	0.542	0.682	0.341
Q fever	0.178	0.443	0.077	0.467	0.789
Rabies	0.444	0.385	0.152	0.265	0.081
Swine flu	0.537	0.074	0.308	0.429	0.406
SARS	0.691	<0.05*	0.244	0.053	0.929
Toxocariasis	0.634	0.318	0.189	0.195	0.134
Toxoplasmosis	0.234	0.179	0.319	0.094	0.432
Trichinellosis	0.461	<0.05*	0.920	0.128	0.692

Table 5. Awareness of attitudes and practices to prevent zoonoses among participants

Attitude/ Practice	Agree % (n)	Disagree % (n)	Unsure % (n)
Avoid eating raw meat	75.3 (201)	16.5 (44)	8.2 (22)
Avoid direct contact with animals	63.7 (170)	23.2 (62)	13.1 (35)
Avoid rearing pets indoor	67.0 (179)	23.6 (63)	9.3 (25)
Do not allow the children to play with animals	65.2 (174)	28.1 (75)	7.5 (20)
Discard animal faeces/waste in a proper place	76.0 (203)	16.5 (44)	6.0 (16)
Vaccinate animal regularly	90.6 (242)	4.9 (13)	4.5 (12)
Feed the animals with a healthy diet	82.2 (220)	18 (6.8)	29 (10.9)
Keep a safety fence around the house for preventing the entry of wild animals	89.1 (238)	4.9 (13)	5.9 (16)
Avoid eating fresh leaves, and fruits without washing them	85.0 (227)	8.6 (23)	6.3 (17)
Wash your hands thoroughly after petting the animals	85.8 (229)	10.1 (27)	4.1 (11)

The ignorance of potential zoonotic hazards by pet owners is of public health importance because, without this knowledge, pet owners are unlikely to take measures to prevent such diseases. These measures include preventing or eliminating infectious agents in pets through appropriate veterinary care, reducing the number of unwanted or poorly supervised pets, preventing pets from soiling public places with their faeces, excluding animals from areas where very young children play, enforcing leash laws, and promoting responsible pet ownership. Educating pet owners about zoonotic health hazards and providing them with sound advice about reducing the risks by veterinarians might be highly effective as they are uniquely suited for this role because of their special knowledge, their rapport with pet-owning clients and most of the time pet owners avail themselves of veterinary services [16-19].

Overall, this study revealed the level of awareness of zoonotic diseases among the new BSc registrants was satisfactory. However, it is inferred BSc undergraduates can be further educated about the preventive and control measures for zoonotic diseases. Hence, it is proposed to conduct a short course or awareness seminars on zoonotic diseases in the first year of BSc undergraduates which will develop their life skills related to the prevention and control of diseases.

It is anticipated that the present paper will result in increased awareness of the scientific community to trigger the education on zoonoses among undergraduate students aiming at the protection of the health of pets and the health of the public by reducing the risk of zoonotic parasite transmission.

Table 6. Chi-square analysis, demonstrating the attitude and practices to prevent zoonotic diseases among participants according to their age, gender, demographic location, educational qualification and presence of pets at home

Variable	P value				
	Sex (male versus female)	Age (years)	Demographic location (urban, sub urban versus rural)	Educational qualification	Presence of pets at home
General Information					
Avoid eating raw meat	<0.05*	0.218	0.100	0.983	0.233
Avoid direct contact with animals	0.194	0.790	0.789	0.125	<0.05*
Avoid rearing pets indoor	0.938	0.488	0.254	0.238	<0.05*
Do not allow the children to play with animals	0.609	0.749	0.468	0.254	<0.05*
Discard animal feces/waste in a proper place	0.297	0.637	0.093	0.253	<0.05*
Vaccinate animal regularly	0.184	0.945	0.072	0.952	0.627
Feed the animals with healthy diet	0.182	0.781	0.649	0.961	0.328
Keep a safety fence around the house for preventing the entering of wild animals	<0.05*	0.391	<0.05*	0.777	0.054
Avoid eating fresh leaves, and fruits without washing them	0.086	0.896	0.314	0.964	0.693
Wash the hands thoroughly after petting the animals	0.145	0.805	<0.05*	0.998	0.527

4. CONCLUSION

In this survey we collate the current situation of the level of awareness on zoonoses, among the distance learners who follows the Bachelor of Science degree programme. As The Open University of Sri Lanka consists of a large student population that is spread throughout the country with a variety of demographic aspects such as occupation and age, the aim of raising awareness of the general public through students will be an easy path. General awareness of students about zoonoses were satisfactory though the awareness did not had an influence by there demographic characteristics. The proportion of respondents who recognized diseases included in the questionnaire as zoonoses was variable and highest-ranked diseases were Rabies, COVID 19, Malaria, Dengue fever and SARS in order. Least identified zoonoses were Listeria infection, Toxoplasmosis, Toxocariasis, Cryptosporidiosis and participants were less aware of parasitic zoonoses. Streams in secondry education of new B.Sc degree registrants, age range, demographic location and the presence of pets a home had a significant influencr of identification of zoonotic diseases by the respondents. Pet owners had a significant awareness of attitudes and practices towards the prevention of zoonotic diseases. Most of the respondents agreed that zoonotic diseases can be prevented by avoiding eating raw meat , avoid eating unwashed fresh fruits and vegetables, avoiding direct contact with animals, avoiding rearing pets indoors, regular vaccination of pets, proper discharge of animal faeces, wash the hands thoroughly after petting the animals. Overall, this study revealed that the level of awareness about zoonotic diseases among the new BSc registrants was satisfactory. Further, it is warranted to extend this study to a large population of students in other universities in Sri Lanka to obtain a broad understating of their awareness. As participation in this survey among newly registered students was voluntary it may lead to some bias in responses. Therefore, it is suggested to build up the methodology for this kind of survey to collect information from all the students in a targeted group.

CONSENT

Written consent was obtained from each participant when starting the survey questionnaire as the first question. The anonymity of the information collected was assured during the survey.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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