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OCCUPATIONAL INJURIES AND ZOONOTIC DISEASE AMONG SMALL ANIMAL VETERINARIANS IN KLANG VALLEY, MALAYSIA

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ABSTRACT

Background: The long-standing issue of occupational injuries and zoonotic disease occurrences while handling animals has been kept 'silent' in the Malaysian setting. Small animal veterinarians being one of the high-risk groups. Yet, their health and safety matter are not being well taken care of seriously. The aim of this study is to measure the prevalence of occupational injuries, from animal bite, scratch and sharp instruments as well as to quantify the prevalence of zoonotic disease from direct contact among this population.

Materials and Methods: This study employs the cross-sectional method. A total of 199 Occupational Zoonotic Disease Questionnaire were manually distributed to 95 small animal private practices around Klang Valley and the Companion Animal Clinic, UVH, UPM. Analysis was done using IBM SPSS version 22.

Result: Response rate of 70% was achieved. About 96% (n=133) respondents have been injured by their patients, while 78% (n=108) had suffered sharp instrument injury, predominantly from needlestick. Around 85% (n=118) of the respondents practice recapping needle. Finally, more than 76% (n=105) have been infected with at least one type of zoonotic disease through direct contact.

Conclusion: Small animal veterinarians are considered a vulnerable population on being exposed with occupational injuries and zoonotic diseases. With ongoing injuries occurring, this escalates the likelihood of infection to happen. The findings from this study may suggest appropriate preventive plan such as continuous training on the importance of standard precaution and proper health surveillance system. Collaboration between the public health and veterinary sector is needed in order to protect this unique group of population.

Keywords: Occupational health, occupational injuries, occupational zoonotic disease, one health, small animal veterinarians and zoonotic disease.

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1.0 Introduction

Zoonotic disease is a situation when infectious disease is transmitted from animals to humans and vice versa (WHO, 2015). Approximately 75% of emerging diseases are zoonotic in nature (Gebreyes et al., 2014). In the other hand, according to Bosch, Musgrave and Wong (2013), occupational zoonotic disease is a condition when zoonotic infection is transmitted while performing work activities involving animals. This could occur through direct contact, inhalation and unintentional ingestion. Nevertheless, the commonest method of occupational zoonotic disease transmission is through direct contact (Jackson & Villarroel, 2012). Therefore, this article will focus solely on occupational zoonotic disease transmitted through direct contact occurring among small animal veterinarians around Klang Valley, Malaysia.

Small animal veterinarians are veterinarians who handle and treat companion animals, for instance cats, dogs and other house pets. They are one of the high-risk groups for being in contact with this occupational biological hazard. Baker and Gray (2009) stated that as compared to the general population, veterinarians and their assistants have a higher risk of contracting zoonotic disease. There is increasing concern that with the lack of preventive measures and systematic health surveillance implementation, this group of population are at a disadvantage side as they would be prone to contracting zoonotic disease. Mild type of zoonotic disease like dermatophytosis, are perceived as an occupational norm. In addition, they have accustomed to get injuries from animal bites and scratches (D'Souza, Barraclough, Fishwick, & Curran, 2009; Epp & Waldner, 2012) as well as from sharp instruments, like surgical tools and needles (Burke, Robertson, Ackerman, & Reilly, 2017; Coelho, 2017). These are renowned methods for them to get zoonotic infection through exposed mucosa (Baker & Gray, 2009) or non-intact skin. Luckily, majority of the current zoonotic disease through direct contact from companion animals have minimal potential to be spread to the community and most of the diseases are self-limiting. When injuries occur, small animal veterinarians will only seek medical treatments if an infection took place or a serious wound was sustained. However, a major problem with this kind of scenario is difficult to be ignored after thinking of various possibilities. Because there is always a possibility for biological agents to undergo gene mutation (Battelli, 2008) and something that is not known to be zoonotic could become a dreadful zoonotic pathogen, like in the cases of MERS (Fehr, Channappanavar, & Perlman, 2016) and Swine Flu (CDC, 2009), just to name a few.

This article aims to demonstrate the occurrence of occupational injuries from animal bites, scratches and sharp instruments as well as the prevalence of zoonotic disease among small animal veterinarians in Klang Valley. As far as we know, there are no recent published studies on the prevalence of occupational injuries and zoonotic disease among Malaysian veterinarians working in the small animal practice. With adequate information and evidence, we will be able to instil appropriate preventive and precaution protocols as well as developing a systematic health surveillance programme for veterinarians working in the small animal practice in the near future.

2.0 Materials and Methods

Cross-sectional method was performed for this study. From 4th February to 28th May 2018, the Occupational Zoonotic Disease Questionnaire, consisting of six pages of A4 size sheets with 31 questions, was manually handed to 199 veterinarians from 95 small animal practices around Klang Valley, and the Companion Animal Clinic, University Veterinary Hospital (UVH), University Putra Malaysia (UPM). The 95 small animal private practices were according to the list made available by MSAVA (Malaysian Small Animal Veterinary Association), while permission to carry out the study in the Companion Animal Clinic, UVH, UPM was officially granted by the hospital director. The questionnaire which included the knowledge domain on zoonotic disease through direct contact, history of animal bite and scratch from carrying out clinical duty, history of injuries from sharp instruments, history of being infected with zoonotic disease during working years, standard precaution practice as well as general information was validated beforehand utilising the design and development research (DDR) approach by employing the fuzzy delphi method (FDM). Question on zoonotic disease history, whether they have experienced one or not, was a dichotomous response. The respondents were also given the list of choice on the type of zoonotic disease that they have experienced. The zoonotic disease transmitted by direct contact that was listed in the question are dermatophyte, cellulitis due to occupational injuries, cat scratch disease (bartonellosis), mange, sporotrichosis, leptospirosis and rabies. Most of these zoonotic diseases, that are transmitted through direct contact, is often seen in the small animal practice setting in Malaysia. Even though rabies is not commonly seen, yet the outbreaks since 2015 became the driving factor for this disease to be included in this list. Data analysis was done using IBM SPSS statistic package version 22.

3.0 Result

3.1 Sociodemographic data

Although we have manually distributed 199 questionnaires to the listed practices, we received back a total of 139 completed forms, as the participation of this study was on voluntary basis. There were a handful of respondents who rejected to participate in this study. This resulted in a response rate of 70%. The sociodemographic data of this study is presented in table 1.

3.1.1 Table 1 Sociodemographic data (n= 139)

		n (%)
Gender		
Male		49 (35.3)
Female		90 (64.7)
Age	(Mean±SD 33.71±10.028)	
20-29		68 (48.9)
30-39		43 (30.9)

40-49	19 (13.7)
50-59	1 (0.7)
60 and above	8 (5.8)
Ethnicity	
Malay	67 (48.2)
Chinese	48 (34.5)
Indian	20 (14.4)
Others	4 (2.9)
Education	
Degree of Veterinary Medicine	134 (96.5)
Postgraduate	5 (3.6)
***Years in service**	
≤5 years	79 (56.8)
>5 years	60 (43.2)

*Years in service: The years servicing in small animal practice.

Majority of the respondents were female small animal veterinarians with the age having mean±SD 33.71±10.028. The respondents for this study were a good mixture of junior and senior veterinarians.

3.2 Work exposure, knowledge on zoonotic disease and the prevalence of occupational injuries and zoonotic disease

All of the respondents had daily contact with cats, while 75% (n=104) of them were also in contact with dogs. More than half, approximately 56% (n=78) of respondents were in contact with small mammals (rabbits and others). A total of 121 veterinarians (87%) received zoonotic disease training from their undergraduate studies and almost 94% (n=130) of the respondents had good knowledge on zoonotic disease. However, they denied of ever receiving formal training on standard precaution when questioned further.

Majority of the respondents have been injured either by animal bite or scratch and suffered from sharp instrument injury, mainly from needle stick. Approximately 76% (n=106) of respondents reported to have been infected with zoonotic disease from direct contact during their working years and a fraction have been diagnosed with more than one type. Table 2 summarizes the prevalence of occupational injuries, needle handling technique and the prevalence of zoonotic disease

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3.2.1 Table 2 Prevalence of occupational injuries and zoonotic disease (n=139)

Profile	n (%)
Occupational Injuries	
Animal bite or scratch	
Yes	133 (95.7)
No	6 (4.3)
Sharp Instrument	
Yes	109 (78.4)
No	30 (21.6)
Type of Instrument	
Needle stick	100 (71.9)
Surgical blade	9 (6.5)
Needle handling technique	
Recap needle after use	
Yes	118 (84.9)
No	21 (15.1)
Infected with zoonotic disease	
Yes	105 (75.5)
No	34 (24.4)
Type of Zoonotic disease*	
Dermatophyte	76 (54.7)
Cellulitis (due to occupational injuries)	51 (36.7)
Cat scratch disease (Bartonellosis)	14 (10.1)
Mange	10 (7.2)
Sporotrichosis	9 (6.5)
Leptospirosis	2 (1.4)
Rabies	0

*Respondents can tick more than one type of zoonotic disease from the questionnaire

More than 90% of respondents have been injured by their patients while more than 70% have suffered sharp instrument injury, predominantly from needlestick. Majority have experienced at least one type of zoonotic disease, with dermatophytosis being the leading cause.

3.3 Association between knowledge of zoonotic disease, years of service in the small animal practice and occupational injuries with history of zoonotic disease.

Despite of this, the association between knowledge of zoonotic disease and history of being infected with zoonotic disease was not significant (x^2=2.080, p=0.222) and the association between the years of service in the small animal practice (less than five years and more than five years) with the history of being infected with zoonotic disease was also not significant (x^2=0.073, p=0.788). It was also noted that injuries from animal bites and scratch was not significantly associated with history of being infected with zoonotic disease (x^2=2.214,

p=0.137) and sharp instrument injury was not significantly associated with history of being infected with zoonotic disease (x^2=1.630, p=0.202). Table 3 further describes the chi-square analysis results.

3.3.1 Table 3 Association analysis between knowledge of zoonotic disease, years of service and occupational injuries with history of zoonotic disease.

	Total		**History of ZD[x]**		**No history of ZD[x]**			
	n	**%**	**n**	**%**	**n**	**%**	**X^2**	**p-value**
Zoonotic disease knowledge							1.084[a]	0.222
Good	130	93.5	100	95.2	30	88.2		
Poor	9	6.5	5	4.8	4	11.8		
Years of service							0.073	0.788
<5 years	79	56.8	59	56.2	20	58.8		
≥5 years	60	43.2	46	43.8	14	41.2		
Injured by animals							2.214[a]	0.157
Yes	133	95.7	102	97.1	31	91.2		
Never	6	4.3	3	2.9	3	8.8		
Sharp instrument injury							1.630	0.202
Yes	109	78.4	85	81	24	70.6		
Never	30	21.6	20	19	10	29.4		

[x]ZD = Zoonotic Disease
*p<0.05
[a]Fisher Exact Test

4.0 Discussion

Although this study is mainly descriptive, it has given an overview on the occupational zoonotic disease situation that is occurring within the small animal veterinarian population in Klang Valley, Malaysia. Furthermore, it illustrates the prevalence of occupational injuries from animal bites, scratches and sharp instruments, predominantly from needlestick. Our response rate from this study was satisfactory (70%), even though Lindemann (2018) suggested that 80% response rate is the best for small sample study. This is probably due to the method of manually handing out the questionnaires in a face to face manner. In addition, the topic of our study might have captured the interest of many of our respondents.

Veterinarians and their assistants are the first liners in encountering sick and subclinical animals, thus making them highly exposed to occupational zoonotic diseases (Whitney, Ailes, Myers, Saliki, & Berkelman, 2009; Wright, Jung, Holman, Marano, & Mcquiston, 2008). The statement correlates with our findings of high zoonotic disease prevalence, which is rather alarming. From this study, dermatophytosis dominates the type of zoonotic disease that small animal veterinarians around Klang Valley have experienced or were experiencing during this study. As stated by Mattei, Beber, and Madrid (2014), dermatophytosis in known to be the commonest zoonotic disease in the small animal practice, hence small animal veterinarians are highly at risk of contracting this disease. Furthermore, dermatophytosis is transmitted by close contact between infected or subclinical animal with humans and fomites like fur escalates the likelihood for zoonotic dermatophytosis to take place (Chitty & Hendricks, 2007; D'Ovidio, Grable, Ferrara, & Santoro, 2014; Weese, Peregrine, & Armstrong, 2002).

Occupational injuries from animals has been viewed as an acceptable scenario in the veterinary field. A study done in Britain proved that 2/3 of veterinarians in the small animal practice have been injured by this mode (BVA, 2015). This report reflects with the findings of our study, whereby 96% of our respondents have encountered injuries from animal bites or scratches while performing clinical procedures. The belief of occupational injuries as norm in the veterinary field should be altered. No occupation covered under the OSHA act 1994, should embrace injuries as an occupational norm. Even though the result from this study showed that there was no significant association between injuries from animals with the history of being infected with zoonotic disease, yet injuries increases the risks for zoonotic infection transmission. This is due to the zoonotic pathogens harbouring in animal saliva and claws transmitting to the exposed human mucosa (Romich, 2008). Appropriate animal handling gloves which are comfortable, stretchable and light, which does not restrict the veterinarian's movements are currently available in the open market nowadays. This protective equipment should be invested and worn while carrying out clinical procedures. The proper and safe restraining techniques should always be applied as animal behaviour is always unpredictable.

From this study, we found that 72% of respondents have experienced needle stick injury throughout their working years. This may possibly be due to the practice of recapping needle and as mentioned earlier, the unpredictable animal behaviour while handling needle. The biological hazard for healthcare worker (HIV, Hepatitis B and Hepatitis C) has reasonably been the driving factor for the medical fraternity to protect workers on complying to standard precaution, primarily universal precaution, while handling sharp instruments in order to avoid needle stick injury (DeGirolamo, Courtemanche, Hill, Kennedy, & Skarsgard, 2013; Motaarefi, Mahmoudi, Mohammadi, & Hasanpour-Dehkordi, 2016). However, the current scenario in the veterinary field demonstrates no serious blood borne zoonotic pathogen present in a clinically normal animal (Coelho, 2017; Leggat, Smith, & Speare, 2009). This is particularly true in the small animal practice, therefore leading veterinarians to let their guards down. Nevertheless, we should not be confident that humans will continue to be free from this substantial risk. As emerging disease are always on the rise, it is not impossible for a potentially devastating blood borne zoonotic disease from companion animals to emerge. With the high prevalence of needlestick injury, it is about time for the veterinary field to consider standard precaution seriously for its veterinarians and their assistants (Leggat et al., 2009). Technical support from the public health, especially the occupational health sector is highly recommended.

We also found that the knowledge on zoonotic disease has no significant association with history of being infected with zoonotic disease among small animal veterinarians in Klang Valley. Even though majority of the respondents had good knowledge on zoonotic disease, yet they denied of receiving formal training on standard precaution during undergraduate studies. This somehow answers on why the association between knowledge on zoonotic disease and history of being infected with one is not significant. Although they may understand what zoonotic disease is about, yet as they lack in standard precaution knowledge, therefore they are unaware on how to protect themselves and their assistants from being infected with zoonotic diseases. This same reason may also be applied with not handling needle as per universal precaution protocol whereby almost 85% of our respondents' practices needle recapping.

The difficulty that we encountered while carrying out this study was the time and physical energy that was needed to distribute the Occupational Zoonotic Disease Questionnaires to the 95 small animal practices around Klang Valley and the Companion Animal Clinic, UVH, UPM as the distance between each practice was relatively far from one another. This was done to ensure that we achieve a good response rate.

5.0Conclusion and recommendation

Occupational injuries from animal bite, scratch and sharp instrument as well as occupational zoonotic diseases remains an occupational health and safety matter. The collaboration between the academician, veterinary and public health field, particularly occupational health sector, is highly needed to counter act on this debilitating issue. First and foremost, formal training on the importance of standard precaution which includes universal precaution and safe work practice, could be embedded in the academic curriculum veterinary medicine studies in Malaysia. Continuous seminars and trainings on the importance of applying standard precaution to prevent from occupational injuries and zoonotic disease should be done then after. Systematic hierarchy of control measures including health promotion, health awareness and a proper health surveillance programmes should be made available for this unique group of population. Moreover, it has been revealed that veterinarians could become sentinels in detecting emerging diseases as they are seroprevalent to different zoonotic pathogens due to the regular exposure of this biological hazard from different types of animal (Sánchez et al., 2017). In the future, it is highly suggestive for compensation schemes to be applied for veterinarians in Malaysia, as practiced in German, Canada and many developed countries (Epp & Waldner, 2012; Nienhaus, Skudlik, & Seidler, 2005).

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Declaration

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Authors contribution

Author 1: Main researcher and main author, Author 2: Co-researcher and co-author, Author 3: Analysis, Author 4: Expert input and Author 5: Co-researcher

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