Town Service Workers' Knowledge, Attitude and Practice towards Leptospirosis

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Abstract

A cross sectional study was conducted to assess the knowledge, attitude and practice (KAP) on leptospirosis among 296 town service workers in Kota Bharu, Kelantan. Workers were interviewed using a validated questionnaire consist of demographic data as well as knowledge, attitude and practice questions. Data were analyzed using SPSS version 12.0.1 software. All respondents were Malay males with the mean age of 42.1 (SD 8.38) years old. The mean duration of employment was 15.6 (SD 8.62) years. Majority of workers had poor knowledge (87.2%) and unsatisfactory practice score (64.5%). In contrast, 64.9% of workers had satisfactory attitude score. In conclusion, identified weakness was noted in knowledge as well as in practice level. The findings of this study suggest that health promotion for town service workers could be improved and warrant for further and special attention.

Keywords: *town service workers, leptospirosis, knowledge, attitude, practice*

Introduction

Leptospirosis is the most widespread re-emerging zoonosis in the world. It is a worldwide public health problem, particularly in tropical and subtropical regions where climatic conditions provide an optimal environment to support the survivability of leptospires.[1-3]

According to World Health Organization from their currently available reports, the incidence of leptospirosis ranges from 0.1–1 per 100 000 per year in temperate climates and 10–100 per 100 000 in the humid tropics. The incidence may reach over 100 per 100 000 in high-exposure risk groups and during outbreaks.[4]

A number of leptospirosis outbreaks have been reported in the last few years in various countries including Malaysia.[5-9] In spite of this, leptospirosis remains a grossly neglected

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disease and suffers for unawareness.[2] Human leptospirosis is endemic infection in Malaysia[10] and it has great potential for outbreaks to occur, so the disease surveillance as well as awareness programs should be stepped up and sustained.

Town service worker were chosen as a study population because they pose risk for leptospiral infection in every steps of the waste management process. [11] Tan (1997) also reported that the prevalence of seropositive among town cleansing labourer up to almost 18%.[12]

Surveys of knowledge, attitudes, and practices (KAP) are a common strategy for collecting information and to assess the safe work practice among populations at risk. The surveys also provide a suitable format to evaluate existing programs and to identify effective strategies for behavior change. Indeed, a good KAP among workers at risk is essential in ensuring successful prevention and control of the disease. Unfortunately no research has been conducted so far in this area in Malaysia. This study presents the results of a study on KAP on leptospirosis among populations at risk of infection in Kota Bharu, Kelantan. We hope the study will provide a baseline data to assist policy makers in developing appropriate evidence-based strategies to prevent and control leptospirosis in Malaysia.

Methods

Study Design and Selection of Participants

A cross sectional study was conducted among town service workers employed by Kota Bharu Municipal Authority in Kelantan, in May 2008. They were comprised of four main job categories namely garbage collector, town cleaner, landscaper and lorry driver. The objective was to assess their knowledge, attitude and practice on leptospirosis. Up to the study date, there is no health education program for this group of workers regarding the awareness of their risk and the related preventive measures that can be practiced in order to reduce the risk of infection.

Sample size was calculated based on pilot study using a single mean formula. The largest and the most feasible sample size were determined from standard deviation (SD) of the practice score which was 8.6. With the precision of 1.0, the estimated sample size calculated was 285. With an anticipated 10% non-response rate, the total sample size required was 314.

The total list of workers in the town service department of the municipality was the sampling frame. We included all town service workers in the department who had served for at least six months so as to make sure that they were really engaged with work activities. However, workers in the department who were office workers, contract workers and those doing part time jobs elsewhere were excluded from the research project. There were a total of 309 workers who met the inclusion and exclusion criteria for this research. In view of that, no sampling was carried out and all of them

were taken as study subjects to meet the required sample size.

Questionnaire and Interview

The workers were subjected to an interviewer guided questionnaire which probed into demographic data and information on knowledge, attitude and practice. It was designed to be completed within 15 minutes for an average respondent. The language used was Bahasa Malaysia in which the mothers tongue of the workers. Any technical terms were translated and explained by the interviewer. The interview was conducted by one of the researchers throughout to avoid the problem of inter-interviewer variations.

A pilot study was conducted among 41 town service workers in Machang District Municipal Council to validate the KAP questionnaire before the actual study was conducted. The questionnaire was developed in stages which included literature search, discussion with experts and pre-testing the questionnaire to ensure good content validity. Fifty (50) final items were selected out of 108 constructed items with a Cronbach's Alpha score for knowledge, attitude, and practice at 0.96, 0.71 and 0.74 respectively.

Knowledge questions started asking whether the respondents had ever heard of leptospirosis and they were asked to specify the source of their information. Only those who had ever heard of the disease were allowed to proceed to answer the rest of knowledge questions which were designed to solicit "correct", "incorrect" and "don't know"

response, "1" mark for don't know and "0" mark for incorrect response. There were 24 knowledge questions which covered causes, signs, symptoms, complications, treatment, prevention and risk factors of leptospirosis.

There were a total of 12 questions on attitude which covered safe work practices, personal protective equipment (PPE) and general practices. Questions on attitude were designed to be answered using a Likert scale (strongly agree / agree / not sure / not agree / strongly not agree). For positive attitude items, scores of "4", "3", "2", "1", and "0" for "strongly agree", "agree", "not sure", "not agree", and "strongly not agree", were given respectively. For negative attitude, the above scoring system was reversed.

Questions on practice were also designed to be answered using a Likert scale (never / seldom / sometimes / often / always). For good practice items, scores of "4", "3", "2", "1", and "0" for "always", "often", "sometimes", "seldom", and "never", were given respectively. For bad practices items, the above scoring system was reversed. A total of 14 questions on preventive practices were asked containing questions on safe work practice, PPE and general practices.

Statistical analysis

Data was entered and analysed using SPSS Version 12.0.1.[13] All continuous variables were described using mean (SD) whereas the categorical data were presented as frequencies (%).

The mean (SD) for each item of the KAP was also analyzed. The proportion of respondents who gave the correct answer for each item in the knowledge domain was expressed as a correct percentage. The proportions for positive attitude and good practice for each item of the KAP were also displayed. Those who answered "strongly agree" or "agree" for the attitude that they should have and "disagree" or "strongly disagree" for the attitude that they should not have are considered as having positive attitude. The proportions for good practice include those who answered "always" or "often" for the practice that they should adopt and "never" or "seldom" for the practice that they should avoid.

The scores for knowledge, attitude, and practice were transformed into percentage scores by dividing the scores obtained by the respondents with the possible maximum scores and multiplied by 100. The percentage score was used in the analysis rather than the raw score because it is easier to appreciate the level of scores in the scale of zero to 100.

The categories of knowledge, attitude and practice scores were decided by consensus among the researchers. For the knowledge category, the respondents who had never heard of leptospirosis are considered to have "poor knowledge". Those who scored <72% are considered to have "moderate knowledge" and those who scored ≥72% are considered to have "good knowledge". The difference between "moderate" and "good" knowledge depends on the mean percentage of total knowledge score among those who had "ever heard of the disease".

Considering the maximum possible score of four points for each item in the attitude and practice domains, the total maximum scores for attitude and practice domain were 48 and 56 respectively. Allowing the minimum average of three points for each item, a total score of less than 36 (3 points x 12 items) out of 48 indicates unsatisfactory attitude while a total score of less than 42 (3 points x 14 items) out of 56 indicates unsatisfactory practice. If we convert them into percentages, a score from zero to <75% may be considered unsatisfactory whereas a score of ≥75 to 100% may be taken as satisfactory attitude and practice scores.

Results

Demographic characteristics

The response rate was 95.8%: 296 workers out of the 309 eligible workers were recruited into the study because 13 workers refused to participate. All respondents were Malay males with the mean age of 42.1 (SD 8.38) years old. The age ranges from 22 to 56 years old. Most of the respondents were married (88.5%). A majority of them had lower secondary school education and below (67.2%): no schooling (0.3%); primary school (21.3%) and lower secondary school (45.6%). Ninety seven respondents (32.8%) had upper secondary school education and above. The mean duration of employment was 15.6 (SD 8.62) years with a range of 2.5 to 35.0 years.

Knowledge on leptospirosis

Study subjects answered a total of 24 close-ended questions about leptospirosis. A large majority of the respondents had never heard of leptospirosis.

 Thus they were considered to have poor knowledge (87.2%). Only 38 workers (12.8%) had ever heard of leptospirosis. Among them, 27 (71.1%) knew about it from television, 6 (15.8%) obtained the information from newspapers and 5 (13.1%) knew about the disease from both in television and newspapers. The mean percentage score for knowledge was 72.0 (SD 8.48). Based on that, 6.7% had good knowledge and 6.1% had moderate knowledge (Table 1). However, the analysis for each knowledge item was carried out only for those who had ever heard about leptospirosis (n=38). The mean score (SD) and the percentage (%) of correct answer for each items are displayed in Table 2.

Attitudes towards leptospirosis

Concerning attitudes towards leptospirosis, the respondents obtained a mean percentage score of 76.8 (SD 10.96). The attitude towards leptospirosis was generally good as 64.9% of the respondents had satisfactory attitude score and 35.1% had unsatisfactory score (Table 1). For each item on attitude, the majority of respondents had positive attitudes. There were, however, 31.8% of the respondents who showed some concern regarding wearing of proper shoes and 59.5% showed doubts about drinking while working. Detail analysis for each item is described in Table 3.

Practice regarding leptospirosis prevention

The mean percentage score on preventive practices against leptospirosis was 69.0 (SD 13.31). In contrast with attitude, 35.5% of the respondents showed satisfactory practice score while 64.5% showed unsatisfactory score (Table 1). The analysis for each

item on preventive practices showed that the use of PPE while working was relatively poor:only 17.9% woremask and 35.8% wore rubber gloves while working. Table 4 shows the mean (SD) score for each item as well as the percentage of workers who adopted good preventive practices on leptospirosis.

Relationship of job characteristics with knowledge, attitude and practice

There were no difference between knowledge, attitude and practice with education level, age and duration of employment. There was also no significant association between knowledge and job category. However, there was a significant difference between attitude and practice level with job category (Table 5, 6 & 7).

Discussion

Our study shows that, there were a low percentage of respondents who had ever heard of leptospirosis (12.8%). Of those who did, they heard about it from either the television or newspaper or both. This is probably due to the fact that the government as well as the media reported extensively on the recent outbreaks of the disease among trainees in the National Service Camps in Malacca[14] and among residents in Johor who were exposed to flood water.[15]

In contrast, a report on leptospirosis in Queensland (2002) noted that 52% of leptospirosis cases have heard about the disease. It was also noted that the word of mouth and posters provided the main

Table 1. Category of knowledge, attitude and practice score among town service workers (n=296)

Category	Frequency	%
Worker's knowledge		
Good (score ≥72%)	20	6.7
Moderate (score <72%)	18	6.1
Poor (never heard about leptospirosis)	258	87.2
Worker's attitude		
Satisfactory (score ≥75%)	192	64.9
Unsatisfactory (score <75%)	104	35.1
Worker's practice		
Satisfactory (score ≥75%)	105	35.5
Unsatisfactory (score <75%)	191	64.5

Table 2. Knowledge items with mean score (SD) and percentage (%) of correct answers (n = 38)

Knowledge items	Mean (SD)	Correct n (%)[a]
Causes		
1. Leptospirosis is a disease caused by micro-organism	1.8 (0.37)	32 (84.2)
2. It is a zoonotic disease	1.8 (0.46)	32 (84.2)
3. Leptospirosis can enter our body through cuts	1.6 (0.60)	24 (63.2)
4. Leptospirosis can enter our body through contaminated food	1.7 (0.55)	30 (78.9)
5. Leptospirosis can be transmitted through mosquito bites	0.8 (0.83)	10 (26.3)
6. Human can be infected by shaking hands with infected persons	1.3 (0.77)	18 (47.4)
Signs, symptoms and complications		
7. Infected person may have myalgia	1.6 (0.55)	24 (63.2)
8. Infected person may have jaundice	1.3 (0.70)	16 (42.1)
9. Infected person may free from any symptom	0.9 (0.70)	7 (18.4)
10. It can cause death	1.7 (0.53)	27 (71.1)
11. It can cause lung cancer	0.9 (0.73)	8 (21.1)
12. It can cause kidney failure	1.4 (0.60)	18 (47.4)
13. It can cause liver damage	1.4 (0.59)	16 (42.1)
14. It can cause diabetes	1.2 (0.80)	16 (42.1)
Risk factors		
15. Eat while working is a risk to get leptospirosis	1.2 (0.83)	17 (44.7)
16. Drink while working is a risk to get leptospirosis	1.1 (0.88)	17 (44.7)
17. Smoke while working is a risk to get leptospirosis	1.2 (0.89)	18 (47.4)
18. Town service workers is not consider risk group	1.4 (0.79)	22 (57.9)

Treatment and prevention

19.	The disease is treatable	1.8 (0.41)	30 (78.9)
20.	The disease can be detected by blood investigation	1.9 (0.34)	33 (86.8)
21.	The disease can be prevented by taking bath after working	1.5 (0.69)	23 (60.5)
22.	The disease can be prevented by maintaining house compound cleanliness	1.9 (0.39)	35 (92.1)
23.	The disease can be prevented by avoiding walking through flood	1.5 (0.73	23 (60.5)
24.	Wearing rubber gloves during work can prevents leptospirosis	1.8 (0.49)	30 (78.9)

[a] Percentage of subjects who gave the correct answers

Table 3. Attitude items with mean score (SD) and percentage (%) for positive attitude (n = 296)

Attitude items	Mean (SD)	Positive Attitude n (%) [a]
Safe work practice and PPE		
1. Drink while working is not a problem	2.8 (1.45)	176 (59.5)
2. I need a "safe work practice" course in order to prevent from getting the disease	3.1 (0.64)	281 (94.9)
3. Rubber gloves is important equipment during working	3.0 (1.00)	257 (86.8)
4. Wearing gloves during working is troublesome	3.5 (0.97)	254 (85.8)
5. Wearing gloves during working make our work slower	3.6 (0.97)	260 (87.8)
6. Wearing gloves during working make me feel discomfort	3.3 (1.15)	237 (80.1)
7. Wearing boots make our work slower	3.5 (1.04)	254 (85.8)
General practice (off work)		
8. I must know about leptospirosis	3.1 (0.66)	277 (93.6)
9. I don't mind to wear any type of shoe	1.8 (1.27)	94 (31.8)
10. I should make sure that my house is free from rats	2.8 (0.95)	261 (88.2)
11. I don't mind if the dustbin in my house had no cover	3.6 (0.85)	270 (91.2)
12. I don't feel worry walking through flood	2.9 (1.17)	210 (70.9)

[a] Percentage of positive attitude who answered "strongly agree" or "agree" for attitude that they should have and "strongly disagree" or "disagree" for attitude that they should not have

Table 4. Practice items with mean score (SD) and percentage (%) for good practice (n = 296)

Practice items	Mean (SD)	Good Practice n (%) [a]
Safe work practice		
1. I eat while working	3.6 (0.75)	249 (84.1)
2. I drink while working	3.1 (1.06)	185 (62.5)
3. I smoke while working	3.4 (1.00)	228 (77.0)
4. Reminding my colleague to follow the working procedure	2.1 (1.31)	81 (27.4)

PPE

5.	I'm wearing rubber gloves during working	1.9 (1.69)	106 (35.8)
6.	I'm wearing boots during working	2.5 (1.50)	132 (44.6)
7.	I'm wearing long sleeves shirt during working	3.7 (0.94)	261 (88.2)
8.	I'm wearing mask during working	1.0 (1.55)	53 (17.9)
9.	I will make sure the glove is in good condition before use it	1.7 (1.72)	98 (33.1)

General practice (off work)

10.	I'll make sure my house is free from rats	2.8 (1.26)	154 (52.0)
11.	I walk through flood	2.5 (1.39)	134 (45.3)
12.	I cover the food	3.8 (0.55)	279 (94.3)
13.	I'm looking after the goat after working hour	3.6 (1.19)	263 (88.9)
14.	I'm looking after the cattle after working hour	3.1 (1.48)	213 (72.0)

[a] Percentage good practice who answered "always" or "often" for practice that they should adopt and "never" or "seldom" for practice that they should avoid

Table 5. Relationship of job characteristics with knowledge level

Variables	Knowledge				p value
	Good		Poor		
	Mean (SD)	n (%)	Mean (SD)	n (%)	
Job category					0.141[a]
Lorry driver		4 (10.5)		35 (13.6)	
Waste collector		15 (39.5)		58 (22.5)	
Landscaper		7 (18.4)		73 (28.3)	
Town cleaner		12 (31.6)		92 (35.7)	
Education category					0.189[a]
Lower secondary and below		22 (57.9)		177 (68.6)	
Upper secondary and higher		16 (42.1)		81 (31.4)	
Age	41.7 (7.58)		42.2 (8.50)		0.759[b]
Duration of employment	15.7 (8.92)		15.6 (8.59)		0.935[b]

[a] Chi square test
[b] Independent t test

Table 6. Relationship of job characteristics with attitude level

| Variables | Attitude | | | | p value |
| | Satisfactory | | Unsatisfactory | | |
	Mean (SD)	n (%)	Mean (SD)	n (%)	
Job category					0.006[a]
Lorry driver		27 (14.1)		12 (11.5)	
Waste collector		55 (28.6)		18 (17.3)	
Landscaper		56 (29.2)		24 (23.1)	
Town cleaner		54 (28.1)		50 (48.1)	
Education category					0.779[a]
Lower secondary and below		128 (66.7)		71 (68.3)	
Upper secondary and higher		64 (33.3)		33 (31.7)	
Age	41.6 (8.35)		42.9 (8.39)		0.199[b]
Duration of employment	15.2 (8.66)		16.3 (8.55)		0.325[b]

[a] Chi square test
[b] Independent t test

Duration of employment	16.2 (8.67)		15.3 (8.60)		0.413[b]

[a] Chi square test
[b] Independent t test

Table 7. Relationship of job characteristics with practice level

| Variables | Practice | | | | p value |
| | Satisfactory | | Unsatisfactory | | |
	Mean (SD)	n (%)	Mean (SD)	n (%)	
Job category					< 0.01[a]
Lorry driver		1 (1.0)		38 (19.9)	
Waste collector		46 (43.8)		27 (14.1)	
Landscaper		40 (38.1)		40 (20.9)	
Town cleaner		18 (17.1)		86 (45.0)	
Education category					0.378[a]
Lower secondary and below		74 (70.5)		125 (65.4)	
Upper secondary and higher		31 (29.5)		66 (34.6)	
Age	41.4 (8.54)		42.5 (8.29)		0.293[b]
Duration of employment	16.2 (8.67)		15.3 (8.60)		0.413[b]

[a] Chi square test
[b] Independent t test

sources of information for them.[16] Similarly another study among the canoeist in North Wales, (1991) revealed a very high proportion (95%) of respondents who had ever heard of the disease because they were exposed to a good health promotion program.[17] In contrast to our study, such studies probably found a higher percentage of who had respondents
ever heard of the diseases because they were either carried out among leptospirosis cases or the subjects were exposed to systematic if not intensive information whereas our study was focused on asymptomatic subjects who were exposed to information on leptospirosis on ad hoc and voluntary basis.

In addition to the above, our study also shows that the weakest area of knowledge among those who had ever heard of leptospirosis, was the "risk factors". It must be noted here that there were workers who even obtained zero percent score. Indeed, without knowing the "risk factors", we cannot expect the workers to be aware of the disease and as a corollary it is almost impossible for them to be motivated to adopt good preventive work practices. Knowledge obtained on "causes" and "treatment and prevention" of leptospirosis was relatively better compared to risk factors. This may imply that the workers know that the disease is caused by a micro-organism and it is related to rat's urine but they have little knowledge on the factors that contributed to the disease.

The knowledge score on the "signs, symptoms, and complications" was also relatively poor. Only 18.4%

of the respondents answered that the infected person may be free from any symptom. This fact indicates that the majority of people are not aware of the disease as most of the infected persons are asymptomatic. In addition to this, our respondents were all asymptomatic and healthy during data collection. Knowledge of the signs, symptoms and complications among the workers are indeed crucial because it will help them to recognize the danger of leptospirosis at an early stage and this may lead to proper case management, which finally will saves lives.

It is interesting that the majority of respondents who had ever heard of leptospirosis had false belief that leptospirosis can be transmitted through mosquito bites and it may also cause lung cancer. This wrong belief may spread to other workers as well as the community and may finally contribute to poor disease control. To some extent, wrong belief about the disease also implies that the workers had gross misconceptions about leptospirosis and they may confuse it with some other diseases which are more familiar to them such as dengue and cancer. This is an important issue which needs to be emphasized to them.

The findings of this study suggest that town service workers needs special attention. In the least, health education programmes for them should be initiated. Following a previous study, it seems crucial that to create awareness among them should be carried out immediately.[17]

Generally, a majority of the workers had positive attitude with only 35% of them having unsatisfactory attitude score. This is a good starting point to carry out a successful prevention and control programs because there still exist difficulties in convincing people to take all the necessary safety precautions even though they may be well aware of the disease. It was stated that "Some see it as similar to smoking - people are aware of the possible consequences but still choose to smoke". Our study suggest that the attitude towards the non-use of PPE and taking a drink while working are important risk areas in their attitude that need to be corrected. The workers may not appreciate the importance of such practices as disease preventions because they simply lack knowledge on the disease and the preventions against it.

In comparison to attitude, a majority of workers, (64.5%) had unsatisfactory practice score. This was probably because they failed to see the benefits of a given behavior. It is possible that the information provided by the media was insufficient to address their lack of understanding in disease prevention. They are particularly weak in the "PPE" sub domain. Items in the PPE sub domain revealed that a lower percentage (less than 45%) of workers practiced wearing of proper boots, rubber gloves, as well as wearing of mask while working. Many studies demonstrated that PPE are important and remained the main predictors for leptospiral infection.[18-20] Future health education efforts should emphasize on this point as well.

Evidently and in spite of the majority of the workers having poor knowledge and unsatisfactory preventive practices, the respondents had relatively satisfactory attitude level. This suggests the importance of practical ways to prevent leptospirosis by educational campaigns. Other than lack of knowledge, it is also possible that the respondents cannot find time to conduct activities that relate to disease prevention, lack of skills or some other factors hindering preventive practices.Further studies should actively look into other factors hindering preventive practices against leptospirosis such as their health behavior and beliefs.

It is possible that the respondents might not tell the truth especially questions on attitude and practice which may introduce to social desirability bias. It was minimized by assuring respondents of their anonymity and confidentiality of individual reports.

Our findings may be applicable to other population with similar characteristics in the municipalities which have the same settings as ours. Like other local authorities, it is essentially an authority providing public services within its area of jurisdiction which only covers a part of the administrative district area.

Conclusion

Our present study demonstrated an interesting pattern in the knowledge, attitude as well as in practice of the workers in this highly prevalent area and hint at the shortcomings of the control program. Considerable weakness was identified in the knowledge which obviously affects the practice. Examining the workers' knowledge, attitudes and

practice and the strategies that recommends will help health professionals to better understand workers' barriers to action, and factors that facilitate the adoption of recommended preventive actions. In turn, this deeper understanding will improve leptospirosis prevention programs.

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