Japanese Encephalitis Knowledge among University Students

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Authors’ contributions

This work was carried out in collaboration among all authors. Authors MSI and MZI designed the study, performed the initial statistical analyses and wrote the protocol. Authors SDK and MSI wrote the first draft of the manuscript. Authors MSI and MZI managed refined analyses. Authors SDK and MSI revised the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Objective: The objective of the study was to evaluate the knowledge of future healthcare providers about Japanese Encephalitis in a university in Malaysia.

Methods: A cross-sectional study was conducted among the students of three different healthcare provider faculties in a university in Malaysia with the help of pre-validated research questionnaire. The Statistical Package for Social Science (SPSS) Version 24.0 was utilized to analyze and present the data.

Results: Overall, 252 respondents from three different healthcare faculties participated in the current study. The medical faculty students had better knowledge as compared to the other two faculties. The students living in their houses with their families had better knowledge about Japanese Encephalitis as compared to the students who were living in hostels.
Conclusion: Overall appropriate knowledge was observed among the three health care provider faculty students. The present study concluded that medical students had more adequate knowledge of Japanese Encephalitis than the other two faculty students.

Keywords: Japanese encephalitis; knowledge; university students; university.

1. INTRODUCTION

Japanese Encephalitis is a disease that spread over via mosquito bites [1]. Japanese encephalitis virus is a virus which belongs to the flavivirus family [2,3]. A host is the main causative agent of this virus, and vectors are responsible for transmitting it [4,5]. Wild birds are likely to be biological hosts for the Japanese encephalitis virus, and mosquitoes are its vectors [6]. Mosquitoes (Culex species mainly) are the vector and the transmitting agent of the disease [7]. Furthermore, if other mosquitoes bite these animals who were recently infected with this virus, they carry it on board and spread the infection to other animals [8].

Symptoms that grow later on consist of swelling around the brain and ultimately coma. Japanese Encephalitis is a life-threatening disease [9]. Approximately one in every 250 patients of Japanese Encephalitis gets more acute symptoms as the infection extends to the brain, but this occurs typically in 15 days after the infection more over more severe symptoms can develop immediately in patients.

There is no proper well-established treatment available for the cure of Japanese Encephalitis [9]. Once a person infected with this disease, treatment can only reduce the symptoms, which mean only symptomatic treatment is available for this disease [10]. Safe and useful vaccines are available to prevent this disease in the community [11]. There are four major categories of vaccines currently in use for this disease. These types contain inactivated mouse brain-derived vaccines, inactivated Vero cell-derived vaccines, live attenuated vaccines, and live recombinant vaccines [12].

The previous studies have proven that the prevalence of Japanese Encephalitis is present in Malaysia [13,14] Therefore, all the health care students must have proper knowledge about Japanese Encephalitis. Thus, the present study was conducted to evaluate the knowledge of the medical, dental and pharmacy students towards Japanese Encephalitis.

2. METHODOLOGY

A cross-sectional study was performed in a university for assessing the knowledge of medical, dental and pharmacy students on Japanese Encephalitis. A self-administered pre-validated research questionnaire was used for the data collection of the current study.

Stratified convenience sampling technique was adopted for recruiting the required sample size from medical, dental and pharmacy students. For assessment of the knowledge, the open-ended statements were asked from all the study participants. All the knowledge questions consisted of one right answer along with two or more wrong answers. All the respondents were asked to understand the questions and wisely select the answer based on their knowledge on each asked statement. The obtained scores were taken and presented as percentage of right and wrong answers.

Data evaluations and statistical presentation were done by Statistical Package for Social Science (SPSS) version 24.0. the data were categorical, and thus, the data were analyzed by Chi-square and Fisher exact test to find the p-value. A value of P < 0.05 was considered statistically significant for the current study.

3. RESULTS

Overall, 252 respondents from three different health care faculties participated in the current study. From these 252 participants, 70 students belong to medical faculty, 100 students belong to pharmacy and 82 belongs to dentistry. The demographic characteristics of the respondents were as follow.

The individual responses against each asked question are presented as followings tables.
Table 1. Knowledge of question 1 N(%)  

| Variables                  | No   | Yes  | p-value | Effect size |
|----------------------------|------|------|---------|-------------|
| Gender                     |      |      |         |             |
| Male                       | 56(74.7) | 19(25.3) | 0.231   | -           |
| Female                     | 134(75.7) | 43(24.3) |         |             |
| Faculty                    |      |      |         |             |
| Medicine                   | 43(61.4) | 37(38.6) | 0.002   | 0.023       |
| Pharmacy                   | 88(88) | 12(12) |         |             |
| Dentistry                  | 59(72) | 23(28) |         |             |
| Age Group                  |      |      |         |             |
| 20-25                      | 181(76.1) | 57(23.9) | 0.871   | -           |
| 26-30                      | 8(61.5) | 5(38.5) |         |             |
| More than 30               | 1(100) | 0(0) |         |             |
| Race                       |      |      |         |             |
| Malay                      | 1(50) | 1(50) | 0.511   | -           |
| Chinese                    | 148(76.7) | 45(23.3) |         |             |
| Indian                     | 41(71.9) | 16(28.1) |         |             |
| Year of Education          |      |      |         |             |
| Year 3                     | 44(88) | 6(12) | 0.003   | 0.020       |
| Year 4                     | 98(81.7) | 22(18.3) |         |             |
| Year 5                     | 48(58.5) | 34(41.5) |         |             |
| Residence                  |      |      |         |             |
| Hosteller                  | 126(75) | 42(25) | 0.495   | -           |
| Non-hosteller              | 64(76.2) | 20(23.8) |         |             |
| Educational Background     |      |      |         |             |
| A-level                    | 9(90) | 1(10) | 0.328   | -           |
| Diploma                    | 25(65.8) | 13(34.2) |         |             |
| Foundation                 | 141(77) | 42(23) |         |             |
| STPM                       | 15(71.4) | 6(28.6) |         |             |

Effect size was measured using Partial Eta Squared ($\eta^2$)

According to Cohen’s classification of effect size,

- if $0.01 \leq \eta^2 \leq 0.06 = small$
- if $0.06 \leq \eta^2 \leq 0.14 = medium$
- if $\eta^2 \geq 0.14 = large$
Question 1: Are you familiar with Japanese Encephalitis?

A statistically significant difference and weak positive association were observed between the response of question 1 with faculty (p=0.002, ϕ=0.019) and year of education (p=0.003, ϕ=0.020) variables. More appropriate knowledge (38.6%) reported by medical students.

Question 2: In my knowledge, mosquitoes are the vector of Japanese Encephalitis.

A statistically significant difference and strong positive association were observed between the response of question 2 with faculty (p<0.001, ϕ=0.325) and a statistically significant weak positive association was seen with residence (p=0.028, ϕ=0.011) variables. More appropriate knowledge (92.9%) reported by medical students.

Question 3: Blood test are frequently used to diagnose Japanese Encephalitis.

A statistically significant difference and weak positive association were observed between the response of question 3 with faculty (p=0.006, ϕ=0.012) and statistically significant strong positive association was observed with residence (p<0.001, ϕ=0.327) variables. More appropriate knowledge (84.1%) reported by final year students.

Question 4: Do you know how to manage Japanese Encephalitis.

A statistically significant difference and weak positive association were observed between the response of question 4 with faculty (p<=0.005, ϕ=0.019) and year of education (p<=0.008, ϕ=0.034). A statistically significant medium positive association was seen with residence (p=0.002, ϕ=0.148) variables. More appropriate knowledge (92.9%) reported by non-hosteller students.

Question 5: Ixaro is the most frequent drug used to treat Japanese Encephalitis.

A statistically significant difference and weak positive association were observed between the response of question 5 with gender (p<=0.021, ϕ=0.011), year of education (p<=0.032, ϕ=0.009) and residence (p=0.002, ϕ=0.038) variables. Statistically significant strong positive association was observed with faculty (p<0.001, ϕ=0.343) variable. More appropriate knowledge (92.9%) reported by non-hosteller students.

4. DISCUSSION

The present study was the first-ever study in Malaysia on knowledge evaluation of future healthcare providers in any university on Japanese Encephalitis. According to the current study findings, a statistically significant difference and weak positive association were observed between the response to the student familiar with Japanese Encephalitis with faculty (p=0.002, ϕ=0.019) and year of education (p=0.003, ϕ=0.020) variables. More appropriate knowledge (38.6%) reported by medical students. The reason behind could be the curriculum of medical students about the pathophysiology of different diseases. The similar results were also reported by a study conducted in Malaysia in 2020. According to the cited study, the knowledge of medical students reported as the best knowledge as compared with the other health care students [15].

A statistically significant and strong positive association were observed between the response of question regarding mosquitoes as the vector of Japanese Encephalitis with faculty (p<0.001, ϕ=0.325) variable and a statistically significant weak positive association was seen with residence (p=0.028, ϕ=0.011) variables. More appropriate knowledge (92.9%) reported by non-hosteller students. The reason behind be the better knowledge of non-hosteller students could be the availability of educated parents and family members of the students. A statistically significant difference and weak positive association were observed between the response of question regarding the management of Japanese Encephalitis with faculty (p<=0.005, ϕ=0.019) and year of education (p=0.008, ϕ=0.034). A statistically significant medium positive association was seen with residence (p=0.002, ϕ=0.148) variables. More appropriate knowledge (92.9%) reported by non-hosteller students. These results of the current study were in contrast with a study conducted in Malaysia by Iqbal and colleagues. According to that, The students who were living in hostels had better knowledge as compared to the other students [16].
Table 2. Knowledge of question 2 N(%)  

| Variables       | No      | Yes     | p-value  | Effect size |
|-----------------|---------|---------|----------|-------------|
| **Gender**      |         |         |          |             |
| Male            | 10(13.3)| 65(86.7)| 0.435    | -           |
| Female          | 23(13)  | 154(87)|          |             |
| **Faculty**     |         |         |          |             |
| Medicine        | 5(7.1)  | 65(92.9)| <0.001   | 0.325       |
| Pharmacy        | 12(12)  | 88(28)  |          |             |
| Dentistry       | 16(19.5)| 66(80.5)|          |             |
| **Age Group**   |         |         |          |             |
| 20-25           | 31(13)  | 207(87)|          |             |
| 26-30           | 2(15.4) | 11(84.6)| 0.452    | -           |
| More than 30    | 0(0)    | 1(100)  |          |             |
| **Race**        |         |         |          |             |
| Malay           | 0(0)    | 2(100)  |          |             |
| Chinese         | 26(13.5)| 167(86.5)|         |             |
| Indian          | 7(12.3) | 50(87.7)|          |             |
| **Year of Education** |     |         |          |             |
| Year 3          | 7(14)   | 43(86)  | 0.598    | -           |
| Year 4          | 14(11.7)| 106(88.3)|         |             |
| Year 5          | 12(14.6)| 70(85.4)|          |             |
| **Residence**   |         |         |          |             |
| Hosteller       | 25(14.9)| 143(85.1)|         |             |
| Non-hosteller   | 8(9.5)  | 76(90.5)| 0.028    | 0.011       |
| **Educational Background** |     |         |          |             |
| A-level         | 1(10)   | 9(90)   | 0.679    | -           |
| Diploma         | 1(2.6)  | 37(97.4)|          |             |
| Foundation      | 29(15.8)| 154(84.2)|         |             |
| STPM            | 2(9.5)  | 19(90.5)|          |             |

Effect size was measured using Partial Eta Squared ($\eta^2$)  
According to Cohen's classification of effect size,  
if $0.01 \leq \eta^2 \leq 0.06 = $ small, if $0.06 \leq \eta^2 \leq 0.14 = $ medium, $\eta^2 \geq 0.14 = $ large

Table 3. Knowledge of question 3 N(%)  

| Variables       | No      | Yes     | p-value  | Effect size |
|-----------------|---------|---------|----------|-------------|
| **Gender**      |         |         |          |             |
| Male            | 21(28)  | 54(72)  | 0.089    | -           |
| Female          | 44(24.9)| 133(75.1)|         |             |
| **Faculty**     |         |         |          |             |
| Medicine        | 11(15.7)| 59(84.3)| 0.006    | 0.012       |
| Pharmacy        | 29(29)  | 71(71)  |          |             |
| Dentistry       | 25(30.5)| 57(69.5)|          |             |
| **Age Group**   |         |         |          |             |
| 20-25           | 47(19.7)| 189(79.4)|         |             |
| 26-30           | 3(23.1) | 10(76.9)| 0.546    | -           |
| More than 30    | 0(0)    | 1(100)  |          |             |
| **Race**        |         |         |          |             |
| Malay           | 1(50)   | 1(50)   | 0.569    | -           |
| Chinese         | 38(19.7)| 154(79.8)|         |             |
| Indian          | 11(19.3)| 45(78.9)|          |             |
| **Year of Education** |     |         |          |             |
| Year 3          | 10(20)  | 39(78)  | <0.001   | 0.327       |
| Year 4          | 27(22.5)| 92(76.7)|          |             |
| Year 5          | 13(15.9)| 69(84.1)|          |             |
Table 4. Knowledge of question 4 N(%)  

| Variables               | No   | Yes   | p-value | Effect size |
|-------------------------|------|-------|---------|-------------|
| **Residence**           |      |       |         |             |
| Hosteller               | 32(19)| 134(79.8)| 0.412  |             |
| Non-hosteller           | 18(21.4)| 66(78.6)|        |             |
| **Educational Background** |      |       |         |             |
| A-level                 | 1(10)| 9(90) | 0.712  |             |
| Diploma                 | 5(13.2)| 33(86.8)|        |             |
| Foundation              | 43(23.5)| 138(75.4)|        |             |
| STPM                    | 1(4.8)| 20(95.2)|        |             |

Effect size was measured using Partial Eta Squared ($\eta^2$)
According to Cohen’s classification of effect size,
if $0.01 \leq \eta^2 \leq 0.06 = \text{small}$, if $0.06 \leq \eta^2 \leq 0.14 = \text{medium}$, $\eta^2 \geq 0.14 = \text{large}$

A statistically significant difference and weak positive association were observed between the response of question on the diagnosis from blood test with faculty variable ($p=0.006$, $\phi=0.012$) and statistically significant strong positive association was observed with residence ($p<0.001$, $\phi=0.327$) variables. More appropriate knowledge (84.1%) reported by final year students. The reason behind could be the better knowledge of senior students than the juniors. The findings of the current study were well supported by a study conducted by Sook Ching Chan [17].

A statistically significant difference and weak positive association were observed between the response of question use of Ixiaro as the most frequent drug used to treat Japanese Encephalitis with gender ($p<=0.021$, $\phi=0.0.011$), year of education ($p<=0.032$, $\phi=0.0.009$) and residence ($p=0.002$, $\phi=0.0.038$) variables. A statistically significant strong positive association...
Table 5. Knowledge of question 5 N(%)  

| Variables           | No   | Yes  | p-value | Effect size |
|---------------------|------|------|---------|-------------|
| Gender              |      |      |         |             |
| Male                | 42(56)| 33(44)| 0.021   | 0.011       |
| Female              | 92(52)| 85(48)|         |             |
| Faculty             |      |      |         |             |
| Medicine            | 47(67.1)| 23(32.9)|         |             |
| Pharmacy            | 47(47)| 53(53)|         |             |
| Dentistry           | 40(48.8)| 42(51.2)|         |             |
| Age Group           |      |      |         |             |
| 20-25               | 128(53.8)| 110(46.2)| 0.419   | -           |
| 26-30               | 5(38.5)| 8(61.5)|         |             |
| More than 30        | 1(100)| 0(0)  |         |             |
| Race                |      |      |         |             |
| Malay               | 1(50)| 1(50)|         |             |
| Chinese             | 105(54.4)| 88(45.6)|         |             |
| Indian              | 28(49.1)| 29(50.9)|         |             |
| Year of Education   |      |      |         |             |
| Year 3              | 28(56)| 22(44)| 0.032   | 0.009       |
| Year 4              | 61(50.8)| 59(49.2)|         |             |
| Year 5              | 45(54.9)| 37(45.1)|         |             |
| Residence           |      |      |         |             |
| Hosteller           | 95(56.5)| 73(43.5)| 0.002   | 0.038       |
| Non-hosteller       | 39(46.4)| 45(53.6)|         |             |
| Educational Background |   |      |         |             |
| A-level             | 3(30)| 7(70)| 0.658   | -           |
| Diploma             | 25(65.8)| 13(34.2)|         |             |
| Foundation          | 95(51.9)| 88(48.1)|         |             |
| STPM                | 11(52.4)| 10(47.6)|         |             |

Effect size was measured using Partial Eta Squared ($\eta^2$)
According to Cohen's classification of effect size,
if $0.01 \leq \eta^2 \leq 0.06$ = small, if $0.06 \leq \eta^2 \leq 0.14$ = medium, $\eta^2 \geq 0.14$ = large

was observed with faculty ($p<0.001$, $\phi=0.343$) variable. More appropriate knowledge (92.9%) reported by non-hosteller students. These study findings were well-supported by previous studies as well [18-20].

As future healthcare providers, healthcare students from medical universities and colleges are the main stakeholder in the healthcare system of a country. Provision of prime healthcare education to them often helps them better understand drug-disease awareness and excellent patient care [21-24]. Up-to-date healthcare approaches, better disease knowledge, and adopting evidence-based practices are crucial for treating infectious diseases and maintaining patients' overall quality of life [25-27].

5. CONCLUSION

The present study concluded diverse response from the future health care providers regarding the knowledge of Japanese Encephalitis. Medical faculty students and final year students had better knowledge as compared to the rest of the participants.

CONSENT AND ETHICAL APPROVAL

The informed consent form was signed from all the participants who agreed to take part in the study. The approval on all ethical aspects was taken from the university research and ethics committee at the study location. All the data in the form of information was taken and were strictly protected and used for clinical research purpose only.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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