# Attitude of Healthcare Students towards Japanese Encephalitis

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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.*

## ABSTRACT

**Objective:** To assess the attitude of healthcare students regarding Japanese Encephalitis (JE) in a medical university.
**Methods:** A descriptive cross-sectional study was conducted using a convenience sampling method. A self-developed and pre-validated tool was used to collect data from students studying in three healthcare faculties of a university in Malaysia. The Statistical Package for Social Science (SPSS) Version 24.0 was used to analyze the data. The level of significance was alpha of 5% (0.05).
**Results:** Of the total of 252 studied student, more female students 177 (70.2%) participated in the present study than the male students 75 (29.8%).. The majority of the final years' students had a positive attitude than the pre-final year students, with female students of the university had a more

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positive attitude (77.4%) as compared to the male students (69.3%) when the question was asked about the personal role in the management of JE is essential

**Conclusion:** Overall positive attitude was observed among the studied healthcare students. The present study concluded that pharmacy students had a more positive attitude than the two other faculties students i.e. dentistry and medicine regarding JE.

## 1. INTRODUCTION

Japanese Encephalitis (JE) is also a mosquito-borne viral infection like dengue, yellow fever [1]. It belongs to the flavivirus family. The causative virus for this disease is known as the Japanese Encephalitis Virus (JEV) [2]. Japanese Encephalitis (JE) belonged to the neurologic infection with various manifestations [3]. Most Japanese Encephalitis (JE) virus infections are mild in nature (fever and headache). Sometimes Japanese Encephalitis (JE) is accompanying without any apparent symptoms, but the severe disease is associated with rapid onset of high fever, headache, spastic paralysis, neck stiffness, disorientation, coma, seizures and death [4]. Japanese Encephalitis (JE) symptoms start occurring about 5 to 15 days after infection [5]. Japanese Encephalitis (JE) and its complications make up a severe public health problem, especially in Asian countries [6].

Japanese encephalitis virus is the most vital etiologic agent of epidemic encephalitis worldwide [7]. Most cases of Japanese Encephalitis occur in China, Thailand, Myanmar, Vietnam, Cambodia, Laos, Nepal, India, Malaysia, Indonesia, Philippines and Sri Lanka. From September 1998 to May 1999, Nipah virus outbreak resulted in 265 cases of acute encephalitis with 105 deaths in Malaysia [8]. However, Japanese Encephalitis (JE) is not ranked as a major public health problem in Malaysia, except the Sarawak state of Malaysia [9]. Few clinical studies conducted in Malaysia reported that Japanese Encephalitis (JE) cases are perhaps more than cases reported in national figures [10,11].

The previous studies have proven that the prevalence of Japanese Encephalitis (JE) is present in Malaysia [10,11]. Therefore, it is important that all the health care students being a future health care provider should have a positive attitude toward Japanese Encephalitis (JE) in Malaysia. A positive attitude always results in the appropriate prevention of the many diseases in the future [12]. Hence, the present study was conducted to assess the attitude of healthcare students regarding Japanese Encephalitis (JE) in a medical university.

## 2. METHODOLOGY

A descriptive cross sectional study was conducted in a private medical university for evaluating the attitude of medical, dental and pharmacy students on Japanese Encephalitis. A self-administered validated questionnaire was used in current study.

Convenience sampling method was adopted for conscripting medical, dental and pharmacy students who were agreed to take part in the study, consent was taken from them and surveyed through a self-administered questionnaire. All the data in the form of information on individuals were strictly protected and used for clinical research only. {explain the data collection process}

For the evaluation of attitudes, the statements were asked to indicate the extent to which they agree with the asked statements, on a pre-determined Five-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). All of the respondents were asked to understand the questions and wisely choose the answer based on their attitude on each asked statement. The obtained scores were taken and presented as percentage of strongly disagree, disagree, neutral, agree and strongly agree.

Data analyses and statistical presentation were performed by Statistical Package for Social Science (SPSS) version 24.0. The normality of the data was checked and the data was found as non-parametric data, therefore categorical 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 different faculties participated in the current study. From these 252 participants 75 were males and 177 were females. The demographic characteristics of the respondents were as follow:

The individual responses against each asked question are presented as followings tables.

Q1. I believe my role in management of Japanese encephalitis is essential.

The statistical significance association were observed in gender (*p=0.012)*, faculty (*p=0.023)* and residence (*p=0.046)* variable in question 1. There was no statistical significance seen in other any variable.

Q2. I will feel disappointed if I am diagnosed with Japanese encephalitis.

The statistically significant association was observed in race (*p=0.018)* variable in question 2. There was no statistical significance seen in any other variable.

Q3. I am very well aware of Japanese encephalitis and its management.

The statistical significance association was observed in gender (*p=0.008)* variable in question 3. There was no statistical significance seen in other any variable.

Q4. My relationship with my friends will change if they diagnose with Japanese encephalitis.

The statistical significance association were observed in gender (*p=0.039)*, faculty (*p=0.044)* and race (*p=0.019)* variable in question 4. There was no statistical significance seen in other any variable.

Q5. I believe less uneducated individuals have Japanese encephalitis than the highly educated.

The statistical significance association were observed in gender (*p=0.044)*, faculty (*p=0.097)* and residence (*p=0.029)* variable in question 5. There was no statistical significance seen in other any variable.

## 4. DISCUSSION

The current study was the first study in Malaysia on attitude assessment of future healthcare providers in any medical university on Japanese Encephalitis (JE). The findings of the present study proved that the female students of the university had a more positive attitude (77.4%) as compared to the male students (69.3%) when the question was asked about the personal role in the management of JE is essential. The reason behind this could be the dedication to serve the community in female students is more as compared to the male students. Similar results were presented by a study conducted in India, according to which female participants had a more positive attitude compared to the males, when the study was conducted on community knowledge and attitude towards [13].

**Table 1. Demographic information of respondents**

| Variable | N | % |
|---|---|---|
| **Gender** | | |
| Male | 75 | 29.8 |
| Female | 177 | 70.2 |
| **Faculty** | | |
| Medical | 70 | 27.8 |
| Pharmacy | 100 | 39.7 |
| Dentistry | 82 | 32.5 |
| **Age Group** | | |
| 20-25 | 238 | 94.4 |
| 26-30 | 13 | 5.2 |
| More than 30 | 1 | 4 |
| **Race** | | |
| Malay | 2 | 8 |
| Chinese | 193 | 76.6 |
| Indian | 57 | 22.6 |
| **Year of Education** | | |
| 3 | 50 | 19.8 |
| 4 | 120 | 47.6 |
| 5 | 82 | 32.5 |
| **Residence** | | |
| Hosteller | 168 | 66.7 |
| Non-hosteller | 84 | 33.3 |
| **Educational Background** | | |
| A-level | 10 | 4 |
| Diploma | 38 | 15.1 |
| Foundation | 183 | 72.6 |
| STPM | 21 | 8.3 |

**Table 2. Response of respondents for Q1 N(%)**

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | *P value* |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | 0.012 |
| Male | 1 (1.3) | 1 (1.3) | 21 (28) | 30 (40) | 22 (29.3) | |
| Female | 2 (1.1) | 3 (1.7) | 35 (19.8) | 78 (44.1) | 59 (33.3) | |
| **Faculty** | | | | | | 0.023 |
| Medicine | 0 (0) | 2 (2.9) | 14 (20) | 33 (47.1) | 21 (30) | |
| Pharmacy | 0 (0) | 0 (0) | 22 (22) | 38 (38) | 40 (40) | |
| Dentistry | 3 (3.7) | 2 (2.4) | 20 (24.4) | 37 (45.1) | 20 (24.4) | |
| **Age Group** | | | | | | 0.061 |
| 20-25 | 3 (1.3) | 2 (0.8) | 56 (23.5) | 106 (44.5) | 71 (29.8) | |
| 26-30 | 0 (0) | 2 (15.4) | 0 (0) | 2 (15.4) | 9 (69.2) | |
| More than 30 | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) | |
| **Race** | | | | | | 0.126 |
| Malay | 0 (0) | 1 (50) | 1 (50) | 0 (0) | 0 (0) | |
| Chinese | 1 (0.5) | 1 (0.5) | 47 (24.4) | 93 (48.2) | 51 (26.4) | |
| Indian | 2 (3.5) | 2 (3.5) | 8 (14) | 15 (26.3) | 30 (52.6) | |
| **Year of Education** | | | | | | 0.094 |
| 3 | 0 (0) | 0 (0) | 18 (36) | 17 (34) | 15 (30) | |
| 4 | 2 (1.7) | 3 (2.5) | 19 (15.8) | 36 (43.9) | 25 (30.5) | |
| 5 | 1 (1.2) | 1 (1.2) | 19 (23.2) | 36 (43.9) | 25 (30.5) | |
| **Residence** | | | | | | 0.049 |
| Hosteller | 2 (1.2) | 4 (2.4) | 28 (16.7) | 78 (46.4) | 56 (33.3) | |
| Non-hosteller | 1 (1.2) | 0 (0) | 28 (33.3) | 30 (35.7) | 25 (29.8) | |
| **Educational Background** | | | | | | 0.725 |
| A-level | 0(0) | 0(0) | 2(20) | 4(40) | 4(40) | |
| Diploma | 0(0) | 0(0) | 1(2.6) | 16(42.1) | 21(55.3) | |
| Foundation | 3(1.6) | 4(2.2) | 47(25.7) | 77(42.1) | 52(28.4) | |
| STPM | 0(0) | 0(0) | 6(28.6) | 11(52.4) | 4(19) | |

*\*Pearson Chi-Square, \*\*Fisher's Exact Test*

**Table 3. Response of respondents for Q2 N(%)**

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | *P value* |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | 0.291 |
| Male | 0(0) | 15(20) | 28(37.3) | 18(24) | 14(18.7) | |
| Female | 7(4) | 21(11.9) | 74(41.8) | 51(28.8) | 24(13.6) | |
| **Faculty** | | | | | | 0.069 |
| Medicine | 1(1.4) | 9(12.9) | 29(41.4) | 16(22.9) | 15(21.4) | |
| Pharmacy | 1(1) | 9(9) | 50(50) | 30(30) | 10(10) | |
| Dentistry | 5(6.1) | 18(22) | 23(28) | 23(28) | 13(15.9) | |
| **Age Group** | | | | | | 0.851 |
| 20-25 | 6(2.5) | 33(13.9) | 98(41.2) | 63(26.5) | 38(16) | |
| 26-30 | 1(7.7) | 3(23.1) | 4(30.8) | 5(38.5) | 0(0) | |
| More than 30 | 0(0) | 0(0) | 0(0) | 1(100) | 0(0) | |
| **Race** | | | | | | 0.018 |
| Malay | 0(0) | 0(0) | 1(50) | 1(50) | 0(0) | |
| Chinese | 7(3.6) | 30(15.5) | 80(41.5) | 50(25.9) | 26(13.5) | |
| Indian | 0(0) | 6(10.5) | 21(36.8) | 18(31.6) | 12(21.1) | |
| **Year of Education** | | | | | | 0.471 |
| 3 | 0(0) | 4(8) | 26(52) | 15(30) | 5(10) | |
| 4 | 1(0.8) | 19(15.8) | 48(40) | 33(27.5) | 19(15.8) | |
| 5 | 6(7.3) | 13(15.9) | 28(34.1) | 21(25.6) | 14(17.1) | |

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | P value |
|---|---|---|---|---|---|---|
| **Residence** | | | | | | 0.060 |
| Hosteller | 3(1.8) | 18(10.7) | 75(44.6) | 49(29.2) | 23(13.7) | |
| Non-hosteller | 4(4.8) | 18(21.4) | 27(22.1) | 20(23.8) | 15(17.9) | |
| **Educational Background** | | | | | | 0.811 |
| A-level | 0(0) | 0(0) | 2(20) | 4(40) | 4(40) | |
| Diploma | 0(0) | 5(13.2) | 15 (39.5) | 11(28.9) | 7(18.4) | |
| Foundation | 6(3.3) | 26(14.2) | 78(42.6) | 50(27.3) | 23(12.6) | |
| STPM | 1(4.8) | 5(23.8) | 7(33.3) | 4(19) | 4(19) | |

*Pearson Chi-Square, **Fisher's Exact Test*

**Table 4. Response of respondents for Q3 N(%)**

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | P value |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | 0.008 |
| Male | 13(17.3) | 14(18.7) | 31(41.3) | 13(17.3) | 4(5.3) | |
| Female | 26(14.7) | 41(23.2) | 89(50.3) | 13(7.3) | 8(4.5) | |
| **Faculty** | | | | | | 0.722 |
| Medicine | 1(1.4) | 11(15.7) | 44(62.9) | 11(15.7) | 3(4.3) | |
| Pharmacy | 23(23) | 27(27) | 47(47) | 1(1) | 2(2) | |
| Dentistry | 15(18.3) | 17(20.7) | 29(35.4) | 14(17.1) | 7(8.5) | |
| **Age Group** | | | | | | 0.092 |
| 20-25 | 37(15.5) | 53(22.3) | 112(47.1) | 24(10.1) | 12(5.0) | |
| 26-30 | 2(15.4) | 2(15.4) | 7(53.8) | 2(15.4) | 0(0) | |
| More than 30 | 0(0) | 0(0) | 1(100) | 0(0) | 0(0) | |
| **Race** | | | | | | 0.126 |
| Malay | 0(0) | 0(0) | 2(100) | 0(0) | 0(0) | |
| Chinese | 37(19.2) | 50(25.9) | 79(40.9) | 19(9.8) | 8(4.1) | |
| Indian | 2(3.5) | 5(8.8) | 39(68.4) | 7(12.3) | 4(7) | |
| **Year of Education** | | | | | | 0.051 |
| 3 | 15 (30) | 14(28) | 20(40) | 0(0) | 1(2) | |
| 4 | 14(11.7) | 28(23.3) | 58(48.3) | 12(10) | 8(6.7) | |
| 5 | 10(12.2) | 13(15.9) | 42(51.2) | 14(17.1) | 3(3.7) | |
| **Residence** | | | | | | 0.079 |
| Hosteller | 27(16.1) | 38(22.6) | 76(45.2) | 17(10.1) | 10(6) | |
| Non-hosteller | 12(14.3) | 17(20.2) | 44(52.4) | 9(10.7) | 2(2.4) | |
| **Educational Background** | | | | | | 0.988 |
| A-level | 1(10) | 0(0) | 7(70) | 1(10) | 1(10) | |
| Diploma | 2(5.3) | 5(13.2) | 25(65.8) | 3(7.9) | 3(7.9) | |
| Foundation | 33(18) | 43(23.5) | 79(43.2) | 20(10.9) | 8(4.4) | |
| STPM | 3(14.3) | 7(33.3) | 9(42.9) | 2(9.5) | 0(0) | |

*Pearson Chi-Square, **Fisher's Exact Test*

The results of the present study showed that the Chinese students had a more positive attitude as compared with the other races of students when the question was asked about the disappointed if I am diagnosed with Japanese encephalitis. The reason behind could be the number of Chinese students in current study. The number of Chinese students was more than all other races in the current study. The similar results presented by a study conducted to evaluate the knowledge of health care students and where the Punjabi students score more better knowledge as compared with others due to more number of Punjabi students in study [14].

The findings of the current study showed that the male students had a more positive attitude (26.6%) as compared with the females (11.8%) when the question was asked about the awareness of JE and its management. This question response disclosed that male students had more understanding of the disease as

compared to female respondents. The reason behind could be the less dedication of female students toward the serving of the community. The opposite results were obtained by a study in Pakistan, by which male students were more dedicated to serve people as compared with the females and its probable pandemic situation on disease [15]. Similarly, current study showed that the male students had a more negative attitude (30.6%) as compared with the females (17.6%) when the question was asked about the change in relationship with friends after diagnosis with Japanese encephalitis and its management. This question showed that male students were more frightened about the virus than female students. The reason behind could be the same as discussed earlier.

**Table 5. Response of respondents for Q4 N(%)**

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | *P value* |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | 0.039 |
| Male | 9(12) | 19(25.3) | 24(32) | 13(17.3) | 10(13.3) | |
| Female | 31(17.5) | 54(30.5) | 61(34.5) | 24(13.6) | 7(4) | |
| **Faculty** | | | | | | 0.044 |
| Medicine | 8(11.4) | 25(35.7) | 24(34.3) | 11(15.7) | 2(2.9) | |
| Pharmacy | 20(20) | 29(29) | 36(36) | 11(11) | 4(4) | |
| Dentistry | 12(14.6) | 19(23.2) | 25(30.5) | 15(18.3) | 11(13.4) | |
| **Age Group** | | | | | | 0.986 |
| 20-25 | 39(16.4) | 68(28.6) | 69(33.2) | 35(14.7) | 17(7.1) | |
| 26-30 | 1(7.7) | 5(38.5) | 5(38.5) | 2(15.4) | 0(0) | |
| More than 30 | 0(0) | 0(0) | 1(100) | 0(0) | 0(0) | |
| **Race** | | | | | | 0.019 |
| Malay | 0(0) | 0(0) | 2(100) | 0(0) | 0(0) | |
| Chinese | 26(13.5) | 59(30.6) | 68(35.2) | 31(16.1) | 9(4.7) | |
| Indian | 14(24.6) | 14(24.6) | 15(26.3) | 6(10.5) | 8(14) | |
| **Year of Education** | | | | | | 0.085 |
| 3 | 9(18) | 9(18) | 25(50) | 6(12) | 1(2) | |
| 4 | 19(15.8) | 45(37.5) | 32(26.7) | 14(11.7) | 10(8.3) | |
| 5 | 12(14.6) | 19(32.2) | 28(34.1) | 17(20.7) | 6(7.3) | |
| **Residence** | | | | | | 0.649 |
| Hosteller | 26(15.5) | 46(27.4) | 58(34.5) | 24(14.3) | 14(8.3) | |
| Non-hosteller | 14(16.7) | 27(32.1) | 27(32.1) | 13(15.5) | 3(3.6) | |
| **Educational Background** | | | | | | 0.172 |
| A-level | 1(10) | 2(20) | 4(40) | 2(20) | 1(10) | |
| Diploma | 4(10.5) | 14(36.8) | 9(23.7) | 8(21.1) | 3(7.9) | |
| Foundation | 31(16.9) | 49(26.8) | 64(35) | 26(14.2) | 13(7.1) | |
| STPM | 4(19) | 8(38.1) | 8(38.1) | 1(4.8) | 0(0) | |

*\*Pearson Chi-Square, \*\*Fisher's Exact Test*

**Table 6. Response of respondents for Q5 N(%)**

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | *P value* |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | 0.044 |
| Male | 7(9.3) | 8(10.7) | 30(40) | 24(32) | 6(8) | |
| Female | 12(6.8) | 42(23.7) | 88(49.7) | 25(14.1) | 10(5.6) | |
| **Faculty** | | | | | | 0.097 |
| Medicine | 5(7.1) | 14(20) | 33(47.1) | 116(22.9) | 2(2.9) | |
| Pharmacy | 7(7) | 26(26) | 55(55) | 8(8) | 4(4) | |
| Dentistry | 7(2.5) | 10(12.2) | 30(36.6) | 25(30.5) | 10(12.2) | |

| Variables | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | *P value* |
|---|---|---|---|---|---|---|
| **Age Group** | | | | | | 0.721 |
| 20-25 | 18(7.6) | 45(18.9) | 110(46.2) | 49(20.6) | 16(6.7) | |
| 26-30 | 1(7.7) | 5(18.5) | 7(53.8) | 0(0) | 0(0) | |
| More than 30 | 0(0) | 0(0) | 1(100) | 0(0) | 0(0) | |
| **Race** | | | | | | 0.076 |
| Malay | 0(0) | 0(0) | 1(50) | 1(50) | 0(0) | |
| Chinese | 15(7.8) | 37(19.2) | 94(48.7) | 38(19.7) | 9(4.7) | |
| Indian | 4(7) | 13(22.8) | 23(40.4) | 10(17.5) | 7(12.3) | |
| **Year of Education** | | | | | | 0.199 |
| 3 | 5(10) | 12(24) | 28(56) | 3(6) | 2(4) | |
| 4 | 6(5) | 24(20) | 52(43.3) | 28(23.3) | 10(8.3) | |
| 5 | 8(9.8) | 14(17.1) | 38(46.3) | 18(22) | 4(4.9) | |
| **Residence** | | | | | | 0.029 |
| Hosteller | 12(7.1) | 36(21.4) | 80(47.6) | 28(16.7) | 12(7.1) | |
| Non-hosteller | 7(8.3) | 14(16.7) | 38(45.2) | 21(25) | 4(4.8) | |
| **Educational Background** | | | | | | 0.561 |
| A-level | 0(0) | 1(10) | 5(50) | 3(30) | 1(10) | |
| Diploma | 1(2.6) | 7(18.4) | 18(47.4) | 7(18.4) | 5(13.2) | |
| Foundation | 18(9.8) | 34(18.6) | 86(47) | 36(19.7) | 9(4.9) | |
| STPM | 0(0) | 8(38.1) | 9(42.9) | 3(14.3) | 1(4.8) | |

*\*Pearson Chi-Square, \*\*Fisher's Exact Test*

Similarly, the results of the present study presented that the non-hostler students had a more negative attitude (29.8%) as compared with the hostler students (23.8%) when the question was asked about the link of education on the Japanese encephalitis.

## 5. CONCLUSION

The present study described mixed answers regarding the attitude for Japanese encephalitis among different healthcare students in a private university in Malaysia. The male students had more positive attitude towards Japanese encephalitis. The Chinese students also had a positive attitude towards information regarding Japanese encephalitis.

## CONSENT AND ETHICAL APPROVAL

The approval on all ethical aspects were taken from the ethics committee of the study center (university). Consent was taken from participants prior of start of the study.

## ACKNOWLEDGEMENT

The authors would like to thank the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University, Alkharj, Saudi Arabia, for the support in the publication of this manuscript. The authors would also like to express their sincere gratitude to all of the participants involved in this study in any capacity.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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