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Amyotrophic Lateral Sclerosis Knowledge among University Students

Muhammad Shahid Iqbal[1*], Salah-Ud-Din Khan[2] Eldowaik Mohamed Salah Saad[3] and Muhammad Zahid Iqbal[4]

[1]Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj, 11942, Saudi Arabia.
[2]Department of Biochemistry, College of Medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia.
[3]Department of Hospital and Clinical Pharmacy, Faculty of Pharmacy, University of Cyberjaya, Cyberjaya, Malaysia.
[4]Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, AIMST University, 08100, Bedong, Kedah Darul Aman, Malaysia.

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, EMS and MZI wrote the first draft of the manuscript. Authors MSI, EMS 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 ALS among students in a university in Malaysia.
Methods: A cross-sectional and observational study was performed among the students of three different healthcare provider faculties (Medical, Pharmacy and Dental) in a university with the help of pre-validated research questionnaire. The Statistical Package for Social Science (SPSS) Version 24.0 was used to analyze and present the data.
Results: A total of 268 university students from three faculties participated in the current study. The medical faculty students and final year students had more appropriate knowledge towards the ALS.
Conclusion: Overall appropriate knowledge was observed among the studied faculty students. The present study concluded that medical students had adequate knowledge of ALS than the other two faculty students.

**Corresponding author: E-mail: drmmsiqbal@gmail.com;*

Keywords: Amyotrophic lateral sclerosis; ALS; knowledge; university students.

1. INTRODUCTION

Amyotrophic lateral sclerosis (ALS) is a progressive and fatal disease that attacks the neurons which are responsible for the control and voluntary movement [1,2]. These neurons die as the disease progresses over time, resulting in the gradual loss of muscle movement, difficulty in speaking, swallowing, and ultimately breathing as well [3]. People with ALS generally have a short lifespan after the diagnosis of the disease. ALS is usually widespread in males, whites, and people with age more than 60 years [4,5]. Currently, ALS does not have a proper cure available, and the exact cause of ALS still unknown [6,7].

The initial indicators of ALS contain slight muscle weakness, clumsy hand movements, and difficulty completing tasks that involve sensitive involvements of the fingers or hands [8,9]. Muscle weakness in legs may result in slipping and falling of the patients. Other symptoms of ALS include the uncontrolled jerking of muscles, stiffness of legs muscles, and coughing [10]. Numerous elements have been identified as possible triggers of the disease, which may consist of an infection of the unidentified virus, an abnormal immune response of the human body [11].

Because ALS disease data is not well-founded, thus students may not be able to identify and gather information about the disease [12], but they always should have appropriate knowledge about the ALS and its management so that they can treat patients in future. The current study was performed to evaluate the knowledge of ALS among students in a university in Malaysia.

2. METHODOLOGY

A study was performed among students from three different healthcare faculties in a university. The study design was a cross-sectional observational study. A self-prepared and pre-validated research questionnaire was used to evaluate the knowledge of respondents. Stratified convenience sampling method was used to estimate the minimum required sample size, and the total minimum targeted sample size was 300 participants from the medical, pharmacy and dental faculties.

Based on the personal knowledge and understanding, all of the participants of the study were requested to read and fill the response against each knowledge question statement. The completed questionnaires were interpreted and presented as a percentage response to ease the data presentation.

Statistical Package for Social Science (SPSS) version 24.0 was used for data analysis and presentations. Frequencies with percentages were measured and interpreted as the categorical variables. The Pearson Chi-Square/Fisher's Exact Test was used to find out the p-value in each variable. A p-value of less than 0.05 was considered statistically significant. Phi Cramer's value was found to measure the effect size of the statistically significant variables. The results of effect size were presented as per the Crohn's classification for categorical data.

3. RESULTS

A total of 268 university students from three faculties (medical, pharmacy and dental) take part in the current study. Demographic of the present study was diverse, including gender, race, faculty, age, year of education, residence and education background. The demographic variables are available in Fig. 1.

3.1 Question 1: I Am Fully Aware of ALS and Its Management

A statistically significant difference was observed between the response of question 1 and faculty ($p=0.029$) and residence ($p=0.023$) variables. More appropriate knowledge reported by medical students. A weak positive association ($\phi=0.011$) was observed between faculty variable and the response of the students.

3.2 Question 2: Noninvasive Ventilation Is the Best Choice to Increase Life Expectancy of ALS patients

A statistically significant difference was observed between the response of question 2 and faculty ($p=0.007$), year of education ($p=0.031$) and residence ($p=0.015$) variables. More appropriate knowledge reported by medical students. A moderate positive association ($\phi=0.023$) was observed between faculty variable and the response of the students.

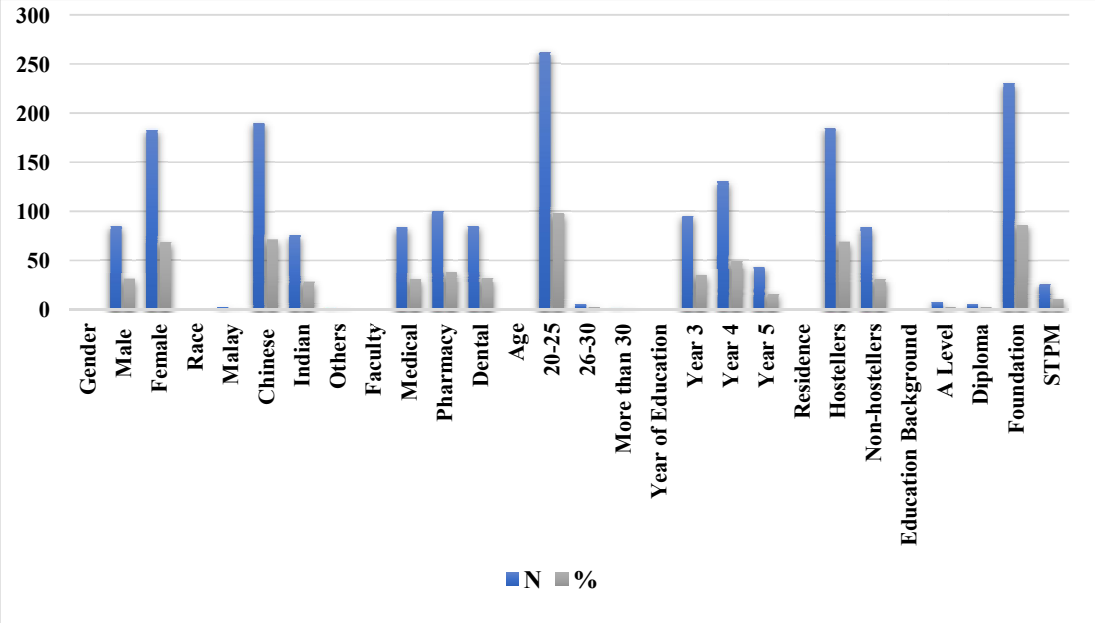

Fig. 1. Demographic information of students

Table 1. Knowledge of question 1 N (%)

Variables	Incorrect	Correct	P-value	Effect size
Gender			0.067	-
Male	16 (18.8)	69 (81.2)		
Female	31 (16.9)	152 (83.1)		
Race			0.059	-
Malay	0 (0.0)	2 (100.0)		
Chinese	34 (17.9)	156 (82.1)		
Indian	13 (17.3)	62 (82.7)		
Others	0 (0.0)	1 (100.0)		
Faculty			0.029	0.011
Medical	12 (14.5)	71 (85.5)		
Pharmacy	21 (21.0)	79 (79.0)		
Dental	14 (16.5)	71 (83.5)		
Age			0.874	-
20-25	47 (17.9)	215 (82.1)		
26-30	0 (0.0)	5 (100.0)		
More than 30	0 (0.0)	1 (100.0)		
Year of Education			0.054	-
Year 3	15 (15.8)	80 (84.2)		
Year 4	25 (19.2)	105 (80.8)		
Year 5	7 (16.3)	36 (83.7)		
Residence			0.023	0.009
Hostellers	37 (20.0)	148 (80.0)		
Non-hostellers	10 (12.0)	73 (88.0)		
Education Background			0.762	-
A Level	1 (14.3)	6 (85.7)		
Diploma	1 (20.0)	4 (80.0)		
Foundation	42 (18.3)	188 (81.7)		
STPM	3 (11.5)	23 (88.5)		

Table 2. Knowledge of question 2 N (%)

Variables	Incorrect	Correct	P-value	Effect size
Gender			0.762	-
Male	35 (41.2)	50 (58.8)		
Female	76 (41.5)	107 (58.5)		
Race			0.549	-
Malay	1 (50.0)	1 (50.0)		
Chinese	78 (41.1)	112 (58.9)		
Indian	31 (41.3)	44 (58.7)		
Others	1 (100.0)	0 (0.0)		
Faculty			0.007	0.023
Medical	31 (37.3)	52 (62.7)		
Pharmacy	52 (52.0)	48 (48.0)		
Dental	28 (32.9)	57 (67.1)		
Age			0.984	-
20-25	111 (42.4)	151 (57.6)		
26-30	0 (0.0)	5 (100.0)		
More than 30	0 (0.0)	1 (100.0)		
Year of Education			0.031	0.018
Year 3	49 (51.6)	46 (48.4)		
Year 4	51 (39.2)	79 (60.8)		
Year 5	11 (25.6)	32 (74.4)		
Residence			0.015	0.008
Hostellers	84 (45.4)	101 (54.6)		
Non-hostellers	27 (32.5)	56 (67.5)		
Education Background			0.812	-
	4 (57.1)	3 (42.9)		
A Level	3 (60.0)	2 (40.0)		
Diploma	96 (41.7)	134 (58.3)		
Foundation	8 (30.8)	18 (69.2)		
STPM				

3.3 Question 3: Protein Mishandling is One of the Dominant Causes of ALS

A statistically significant difference was observed between the response of question 2 with the year of education (p=0.028) and residence (p=0.022) variables. More appropriate knowledge reported by year 5 students. A weak positive association (ϕ=0.013) was observed between faculty variable and the response of the students.

3.4 Question 4: Electromyography is Very Effective in Diagnosis of ALS

A statistically significant difference was observed between the response of question 4 with faculty (p=0.024) and year of education (p=0.039) variables. More appropriate knowledge reported by medical students. A weak positive association (ϕ=0.019) was observed between faculty variable and the response of the students.

3.5 Question 5: ALS is Not a Contagious Disease

A statistically significant difference was observed between the response of question 5 and faculty (p=0.004), year of education (p=0.011) and residence (p=0.018) variables. More appropriate knowledge reported by medical students. A strong positive association (ϕ=0.239) was observed between faculty variable and the response of the students.

4. DISCUSSION

The current study is the innovative study that was conducted in a Malaysian university to appraises the knowledge of students from the medical, pharmacy and dental faculties regarding ALS. The results of the current study showed that a statistically significant effect was found between the response of question regarding the awareness about ALS and its management with

faculty (p=0.029) and residence (p=0.023) variables. More appropriate knowledge reported by medical students. A weak positive association (ϕ=0.011) was observed between faculty variable and the response of the students. The results of the current study were in line with a study conducted in Malaysia by Iqbal and colleagues. The drug-related knowledge and clinical skills were more appropriate in medical students than the pharmacy and dental students [13].

The findings of the current study showed that statistically significant differences were observed between the response of question regarding the Noninvasive ventilation is the best choice to increase life expectancy of ALS patients. A statistically significant difference was observed between the response of question and faculty (p=0.007), year of education (p=0.031) and residence (p=0.015) variables. More appropriate knowledge reported by medical students. A moderate positive association (ϕ=0.023) was observed between faculty variable and the response of the students. The results of the current study were different from the study conducted in Malaysia in a university according to which the pharmacy students had better knowledge as compared to the medical and dental students on Ebola Virus Disease [14].

A statistically significant difference was observed between the response of question regarding Protein mishandling is one of the dominant causes of ALS with the year of education (p=0.028) and residence (p=0.022) variables. More appropriate knowledge reported by year 5 students. A weak positive association (ϕ=0.013) was observed between faculty variable and the response of the students. The results of the current study was in line with a study conducted in a university in Malaysia, according to which the final year students pad better knowledge as compared to pre-final year students [15].

Table 3. Knowledge of question 3 N (%)

Variables	Incorrect	Correct	P-value	Effect size
Gender			0.341	-
Male	33 (38.8)	52 (61.2)		
Female	68 (37.2)	115 (62.8)		
Race			0.653	-
Malay	1 (50.0)	1 (50.0)		
Chinese	77 (40.5)	113 (59.5)		
Indian	22 (29.3)	53 (70.7)		
Others	1 (100.0)	0 (0.0)		
Faculty			0.071	-
Medical	33 (39.8)	50 (60.2)		
Pharmacy	38 (38.0)	62 (62.0)		
Dental	30 (35.3)	55 (64.7)		
Age			0.344	-
20-25	101 (38.5)	161 (61.5)		
26-30	0 (0.0)	5 (100.0)		
More than 30	0 (0.0)	1 (100.0)		
Year of Education			0.028	0.013
Year 3	38 (40.0)	57 (60.0)		
Year 4	48 (36.9)	82 (63.1)		
Year 5	15 (34.9)	28 (65.1)		
Residence			0.022	0.009
Hostellers	65 (35.1)	120 (64.9)		
Non-hostellers	36 (43.4)	47 (56.6)		
Education Background			0.445	-
A Level	2 (28.6)	5 (71.4)		
Diploma	2 (40.0)	3 (60.0)		
Foundation	87 (37.8)	143 (62.2)		
STPM	10 (38.5)	16 (61.5)		

Table 4. Knowledge of question 4 N (%)

Variables	Incorrect	Correct	P-value	Effect size
Gender			0.258	-
Male	14 (16.5)	71 (83.5)		
Female	31 (16.9)	152 (83.1)		
Race			0.349	-
Malay	1 (50.0)	1 (50.0)		
Chinese	36 (18.9)	154 (81.1)		
Indian	8 (10.7)	67 (89.3)		
Others	0 (0.0)	1 (100.0)		
Faculty			0.024	0.019
Medical	12 (14.5)	71 (85.5)		
Pharmacy	20 (20.0)	80 (80.0)		
Dental	13 (15.3)	72 (84.7)		
Age			0.875	-
20-25	44 (16.8)	218 (83.2)		
26-30	0 (0.0)	5 (100.0)		
More than 30	1 (100.0)	0 (0.0)		
Year of Education			0.039	0.008
Year 3	21 (22.1)	74 (77.9)		
Year 4	19 (14.6)	111 (85.4)		
Year 5	5 (11.6)	38 (88.4)		
Residence			0.051	-
Hostellers	28 (15.1)	157 (84.9)		
Non-hostellers	17 (20.5)	66 (79.5)		
Education			0.482	-
Background	3 (42.9)	4 (57.1)		
A Level	2 (40.0)	3 (60.0)		
Diploma	36 (15.7)	194 (84.3)		
Foundation	4 (15.4)	22 (84.6)		
STPM				

The current study reported that statistically significant difference was observed between the response of question about the Electromyography as very useful in the diagnosis of ALS with faculty (p=0.024) and year of education (p=0.039) variables. More appropriate knowledge reported by medical students. A weak positive association (ϕ=0.019) was observed between faculty variable and the response of the students. Similarly, the current study also reported the statistically significant difference was observed between the response of question regarding ALS as a not contagious disease with and faculty (p=0.004), year of education (p=0.011) and residence (p=0.018) variables. More appropriate knowledge reported by medical students. A strong positive association (ϕ=0.239) was observed between faculty variable and the response of the students. The results of the current study are also in line with a study conducted in the past according to that the medical students had better knowledge as compared to pharmacy and dental students when the question was asked about the treatment recommendation of any disease [16]. There are a few study limitations. This study was only conducted at a single university whereby the findings of this study cannot be observed as findings of all of the institutes in Malaysia.

As the main stakeholder in the healthcare system of a country in future healthcare setups, healthcare students need to be well-trained in the provision of best healthcare facilities and proper treatment regimens to their patients and an excellent healthcare education enables them better understand drug-disease interactions and overall disease management [17-20]. Adopting evidence-based practices, optimal healthcare approaches, better disease knowledge are crucial for treating infectious diseases and maintaining patients' overall quality of life especially in chronic diseases [21-24].

Table 5. Knowledge of question 5 N (%)

Variables	Incorrect	Correct	P-value	Effect size
Gender			0.174	-
Male	28 (32.9)	57 (67.1)		
Female	64 (35.0)	119 (65.0)		
Race			0.672	-
Malay	2 (100.0)	0 (0.0)		
Chinese	68 (35.8)	122 (64.2)		
Indian	21 (28.0)	54 (72.0)		
Others	1 (100.0)	0 (0.0)		
Faculty			0.004	0.239
Medical	24 (28.9)	59 (71.1)		
Pharmacy	40 (40.0)	60 (60.0)		
Dental	28 (32.9)	57 (67.1)		
Age			0.349	-
20-25	90 (34.4)	172 (65.6)		
26-30	2 (40.0)	3 (60.0)		
More than 30	0 (0.0)	1 (100.0)		
Year of Education			0.011	0.028
Year 3	38 (40.0)	57 (60.0)		
Year 4	40 (30.8)	90 (69.2)		
Year 5	14 (32.6)	29 (67.4)		
Residence			0.018	0.014
Hostellers	69 (37.3)	116 (62.7)		
Non-hostellers	23 (27.7)	60 (72.3)		
Education Background			0.482	-
A Level	2 (28.6)	5 (71.4)		
Diploma	2 (40.0)	3 (60.0)		
Foundation	78 (33.9)	152 (66.1)		
STPM	10 (38.5)	16 (61.5)		

5. CONCLUSION

The findings of the current study exhibited a mixed observations regarding the knowledge level of ALS among the studied cohort of the university students. The pharmacy and medical students had appropriate knowledge of ALS.

CONSENT AND ETHICAL APPROVAL

Before getting involved in the study, the informed consent form was obtained from all the participants. The ethical approval of the study was taken from the research and ethical committee of the university. All the ethics, involving the confidentiality of the data and identification of the participants were strictly followed as per the research and ethical committee guidelines.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Blatzheim K. Interdisciplinary palliative care, including massage, in treatment of amyotrophic lateral sclerosis. J. Bodyw. Mov. Ther. 2009;13(4):328–335.
2. Zarei S, Carr K, Reiley L et al. A comprehensive review of amyotrophic lateral sclerosis. Surg. Neurol. Int; 2015. DOI:10.4103/2152-7806.169561.
3. Morris J. Amyotrophic lateral sclerosis (ALS) and related motor neuron diseases: An overview. Neurodiagn. J. 2015;55(3): 180–194.
4. Chiò A, Mora G, Calvo A et al. Epidemiology of ALS in Italy: A 10-year prospective population-based study. Neurology. 2009;72(8):725–731.
5. Orsini M, Oliveira AB, Nascimento OJM, et al. Amyotrophic lateral sclerosis: New

perspectives and update. Neurol. Int. 2015; 7(2):39–47.
6. Oliveira ASB, Pereira RDB. Amyotrophic lateral sclerosis (ALS): Three letters that change the people's life. For ever. Arq. Neuropsiquiatr. 2009;67(3 A):750–782.
7. Ringholz GM, Appel SH, Bradshaw M et al. Prevalence and patterns of cognitive impairment in sporadic ALS. Neurology 2005;65(4):586–590.
8. Rowland LP. Diagnosis of amyotrophic lateral sclerosis. J. Neurol. Sci. (Elsevier). 1998;160(Suppl. 1):S6–S24.
9. Gordon PH. Amyotrophic lateral sclerosis: Pathophysiology, diagnosis and management. CNS Drugs. 2011;25(1):1-15.
10. Mathis S, Couratier P, Julian A, et al. Management and therapeutic perspectives in amyotrophic lateral sclerosis. Expert Rev. Neurother. 2017;17(3):263–276.
11. Appel SH. A unifying hypothesis for the cause of amyotrophic lateral sclerosis, parkinsonism, and alzheimer disease. Ann. Neurol. 1981;10(6):499-505.
12. Chiò A, Logroscino G, Hardiman O et al. Prognostic factors in ALS: A critical review. Amyotroph. Lateral Scler. 2009;10(5-6): 310–323.
13. Iqbal MS, Iqbal MZ, Rajan S, Ahmed NJ. Evaluation of Drug-related Knowledge and Clinical Skills among Future Healthcare Professionals. J. Pharm. Res. Int. 2020; 32(8):44–50.
14. Iqbal M, Iqbal M, Deneshwary B, et al. Knowledge and Perception of Medicine, Dentistry and Pharmacy Students of Malaysian University Regarding Ebola Virus Disease (EVD). Value Heal. 2016; 19(7):A913.
15. Iqbal MZ, Khan S-U-D, Iqbal MS. Future Healthcare Providers' Knowledge about Ebola Virus Disease: A private university students' perspective. J. Pharm. Res. Int. 2020;32(28):93–101.
16. Iqbal MZ, Ali AN, Bahari MB, Iqbal MS. Determinants affecting knowledge of healthcare students towards mental health challenges. Int. J. Pharm. Investig. 2020; 10(3):413–416.
17. Musarrat Rauf Burki, Sadia Shakeel, Saira Hayat, Amer Hayat Khan, Muhammad Shahid Iqbal, Jiyauddin Khan. Evaluation of knowledge, attitude and practices of university students towards rational use of medicines. Medical Science. 2020;24(106): 4425-4437.
18. Sadia Shakeel, Faiza Hayat, Saifullah Mehsud, Amer Hayat Khan, Muhammad Shahid Iqbal, Jiyauddin Khan. Students' knowledge and attitude towards rational use of antibiotics. Medical Science. 2020; 24(106):4499-4509.
19. Ahmed A Albassam, Muhammad Zahid Iqbal, Fahad I Al-Saikhan, Salah-Ud-Din Khan, Muhammad Shahid Iqbal. Attitude of future healthcare professionals towards Ebola virus disease. Medical Science. 2020;24(106):3901-3910
20. Muhammad Zahid Iqbal, Salah-Ud-Din Khan, Muhammad Shahid Iqbal. Oral healthcare attitude among students of a medical university. Medical Science. 2020;24(106):3891-3900.
21. Ahmed A Albassam, Muhammad Zahid Iqbal, Fahad I Al-Saikhan, Salah-Ud-Din Khan, Muhammad Shahid Iqbal. Knowledge of mental health challenges among healthcare students – Findings from a medical university. Medical Science. 2020;24(106):3881-3890.
22. Muhammad Zahid Iqbal, Ahmed A. Albassam, Ziyad S. Almalki, Salah-Ud-Din Khan, Muhammad Shahid Iqbal. Healthcare students' perception about mental illnesses– A cross-sectional study. Medical Science. 2020;24(106):3835-3844
23. Muhammad Shahid Iqbal, Muhammad Zahid Iqbal, Salah-Ud-Din Khan, Eldowaik Mohamed Salah Saad, Yaman Walid Kassab. Evaluation of health-related quality of life among healthcare professionals– A cross-sectional study findings. Medical Science. 2020;24(106): 4471-4476.
24. Muhammad Shahid Iqbal. Predictors of health-related quality of life among healthcare professionals. Medical Science. 2020;24(106):4445-4452.

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