



University Students' Attitude towards Amyotrophic Lateral Sclerosis

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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, 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 attitude of university students towards Amyotrophic Lateral Sclerosis (ALS) in a medical university.

Methods: A cross-sectional study was performed among the students of three different faculties (Medical, Pharmacy and Dental) in a medical university in Malaysia using a self-prepared and pre-validated research tool. The Statistical Package for Social Science (SPSS) Version 24.0 was used to analyze and present the data.

Results: A total of 268 students from three faculties participated in the present study. The faculty of pharmacy students and male students had more positive attitude towards ALS. The positive attitude was more among the non-hostellers than the hostellers.

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Conclusion: Overall positive attitude was observed among the three health care provider faculty students. The present study concluded that pharmacy students had a more positive attitude towards ALS than the other two faculty students.

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

1. INTRODUCTION

Amyotrophic lateral sclerosis (ALS) is the most progressive disorder that belongs to the motor neuron system [1]. Motor neurons from the spinal cord reach the muscles throughout the body. The progressive deterioration of these motor neurons in ALS ultimately starts to die with the passage of time [2]. When these motor neurons die, the capability of the brain to instigate and regulate muscle movement can also drop [3]. When the voluntary muscle action is gradually altered by ALS, the patient may be unable to eat, move, speak and breathe [4].

The exact cause responsible for ALS occurrence is unknown, but environmental and genetic factors may contribute significantly to its occurrence [5]. Generally, there are two types of ALS, the sporadic and familial [6]. The sporadic type is the most widespread type present in the United States, which accounts for about 90 to 95% of all the ALS patients. It may happen to anyone and anywhere [7]. The second type is Familial ALS (FALS) which accounts for 5 to 10% of ALS patients in the United States. Familial ALS type is generally known as the inherited ALS disease [8].

ALS can affect people of any ethnicity or culture, but it can usually affect the person with age between 40 and 70 years, but it can still occur at a younger age as well [9]. Most of the time, the ALS patients live around 3 and 5 years after the starting of symptoms belong to ALS [10]. Since ALS disease's data is not much evident in the literature, which may show that varied attitude exists among various countries and their populations especially healthcare providers, healthcare students, university students and general public [11]. University students are among the highly educated people of a country and it is always expected that they should have an appropriate and positive attitude towards ALS and its management. The current study's main objective was to assess university students' attitudes towards ALS.

2. METHODOLOGY

A cross-sectional study was performed among the students of three different faculties (Medical, Pharmacy and Dental) in a medical university in

Malaysia using a self-prepared and pre-validated research tool. The sample size for the current study was calculated by the stratified convenience sampling method. The absolute minimum estimated targeted sample size was 300 participants from three faculties of a medical university.

All the ethics, involving the confidentiality of the data and identification of the participants were strictly followed as per the committee guidelines. Based on their personal attitude, all of the study participants were requested to read and fill the response against each question statement. The achieved scores were interpreted 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. The present study participants' demographic characteristics were diverse, including gender, race, faculty, age, year of education, residence, and educational background. The demographic variables are presented in Fig. 1.

Question 1: I believe ALS is a life-threatening disease

A statistically significant difference was observed between the response of question 1 and race ($p=0.041$), faculty ($p=0.017$) and year of education ($p=0.045$) variables. The positive attitude was more in the pharmacy students. A weak positive association ($\phi=0.017$) was observed between the faculty variable and the response of the students.

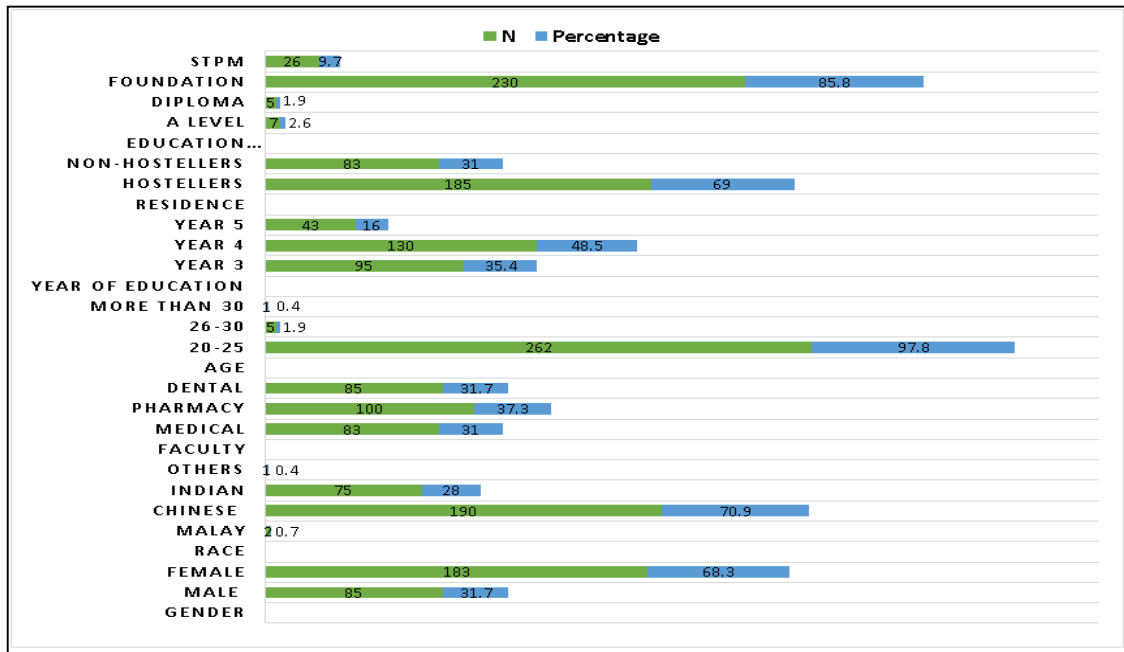


Fig. 1. Demographic information of respondents

Question 2: I believe palliative care for ALS patients is essential and life-saving

A statistically significant difference was observed between the response of question 2 and faculty (p=0.013), year of education (p=0.025) and residence (p=0.027) variables. The positive attitude was more in the non-hostellers. A weak positive association ($\phi=0.016$) was observed between the residence variable and the response of the students.

Question 3: I believe the Ice Bucket Challenge made ALS well-known among the general public

A statistically significant difference was observed between the response of question 3 with gender (p=0.039) and residence (p=0.035) variables. The positive attitude was more in the non-hostellers. A weak positive association ($\phi=0.010$) was observed between the residence variable and the response of the students.

Question 4: In my opinion, ALS patients' life should be ended by a lethal medication instead of letting them suffer throughout their life

A statistically significant difference was observed between the response of question 4 with gender

(p=0.025) variables. The positive attitude was more in the male students. A weak positive association ($\phi=0.013$) was observed between the gender variable and the response of the students.

Question 5: I believe that yet there is a lot of research needed to better understand ALS treatment and management

A statistically significant difference was observed between the response of question 4 with gender (p=0.015) variables. The positive attitude was more in the female students. A moderate positive association ($\phi=0.021$) was observed between the gender variable and the students' response.

4. DISCUSSION

The current study is a novel study which is conducted in a Malaysian medical university to assesses the attitude of different faculty students regarding ALS. The results of the current study revealed that a statistically significant effect was observed between the response of question regarding the belief of ALS as a life-threatening disease with race (p=0.041), faculty (p=0.017) and year of education (p=0.045) variables. The Chinese students and faculty of pharmacy students had a more positive attitude towards the belief of ALS as a life-threatening disease. A

weak positive association ($\phi=0.017$) was observed between the faculty variable and the response of the students. The proposed reason behind this could be pharmacy students' positive attitude compared to other health care provider students. The findings of a more positive attitude from pharmacy students of the current study are actually in line with a study conducted in Malaysia about mental health illnesses. According to the cited study, pharmacy students had a more positive attitude as compared to others [12].

The findings of the current study showed that statistically significant differences were observed between the response of question regarding the belief as palliative care for ALS patients is essential and life-saving with faculty ($p=0.013$), year of education ($p=0.025$) and residence ($p=0.027$) variables. The positive attitude was

more in the non-hostellers. A weak positive association ($\phi=0.016$) was observed between the residence variable and the response of the students. Similarly, A statistically significant difference was observed between the response to question regarding the person believes in Ice Bucket Challenge made ALS well-known among the general public with gender ($p=0.039$) and residence ($p=0.035$) variables. The positive attitude was more in the non-hostellers. A weak positive association ($\phi=0.010$) was observed between residence variable and the response of the students. The results of the current study are in contrast with a study conducted in Malaysia on Japanese encephalitis, according to which hostellers had a more positive attitude as compared to non-hostellers [13]. The current study results were also in line with a study conducted in Malaysia in 2020 [14].

Table 1. Attitude towards question 1 N (%)

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	P-value	Effect size
Gender						0.067	-
Male	3 (3.5)	12 (14.1)	28 (32.9)	35 (41.2)	7 (8.2)		
Female	5 (2.7)	10 (5.5)	65 (35.5)	88 (48.1)	15 (8.2)		
Race						0.041	0.012
Malay	1 (5.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)		
Chinese	3 (1.6)	15 (7.9)	65 (34.2)	89 (46.8)	18 (9.5)		
Indian	4 (5.3)	7 (9.3)	28 (37.3)	32 (42.7)	4 (5.3)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Faculty						0.021	0.017
Medical	5 (6.0)	10 (12.0)	24 (28.9)	39 (47.0)	5 (6.0)		
Pharmacy	2 (2.0)	3 (3.0)	33 (33.0)	48 (48.0)	14 (14.0)		
Dental	1 (1.2)	9 (10.6)	36 (42.4)	36 (42.4)	3 (3.5)		
Age						0.067	-
20-25	8 (3.1)	19 (7.3)	91 (34.7)	122 (46.6)	22 (8.4)		
26-30	0 (0.0)	2 (40.0)	2 (40.0)	1 (20.0)	0 (0.0)		
More than 30	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Year of Education						0.045	0.010
Year 3	3 (3.2)	8 (8.4)	25 (26.3)	45 (47.4)	14 (14.7)		
Year 4	5 (3.8)	9 (6.9)	46 (35.4)	63 (48.5)	7 (5.4)		
Year 5	0 (0.0)	5 (11.6)	22 (51.2)	15 (34.9)	1 (2.3)		
Residence						0.087	-
Hostellers	5 (2.7)	15 (8.1)	67 (36.2)	81 (43.8)	17 (9.2)		
Non-hostellers	3 (3.6)	7 (8.4)	26 (31.3)	42 (50.6)	5 (6.0)		
Education Background						0.235	-
A Level	0 (0.0)	0 (0.0)	3 (42.9)	4 (57.1)	0 (0.0)		
Diploma	0 (0.0)	1 (20.0)	0 (0.0)	3 (60.0)	1 (20.0)		
Foundation	7 (3.0)	20 (8.7)	80 (34.8)	103 (44.8)	20 (8.7)		
STPM	1 (3.8)	1 (3.8)	10 (38.5)	13 (50.0)	1 (3.8)		

Table 2. Attitude towards question 2 N (%)

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	P-value	Effect size
Gender						0.417	-
Male	0 (0.0)	1 (1.2)	10 (11.8)	60 (70.6)	14 (16.5)		
Female	1 (0.5)	1 (0.5)	24 (13.1)	126 (68.9)	31 (16.9)		
Race						0.078	-
Malay	0 (0.0)	1 (50.0)	0 (0.0)	1 (50.0)	0 (0.0)		
Chinese	0 (0.0)	0 (0.0)	21 (11.1)	141 (74.2)	28 (14.7)		
Indian	1 (1.3)	1 (1.3)	13 (17.3)	43 (57.3)	17 (22.7)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Faculty						0.013	0.007
Medical	0 (0.0)	1 (1.2)	6 (7.2)	60 (72.3)	16 (19.3)		
Pharmacy	1 (1.0)	1 (1.0)	21 (21.0)	54 (54.0)	23 (23.0)		
Dental	0 (0.0)	0 (0.0)	7 (8.2)	72 (84.7)	6 (7.1)		
Age						0.657	-
20-25	1 (0.4)	2 (0.8)	32 (12.2)	184 (70.2)	43 (16.4)		
26-30	0 (0.0)	0 (0.0)	2 (40.0)	1 (20.0)	2 (40.0)		
More than 30	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Year of Education						0.025	0.014
Year 3	0 (0.0)	2 (2.1)	13 (13.7)	58 (61.1)	22 (23.2)		
Year 4	1 (0.8)	0 (0.0)	18 (13.8)	90 (69.2)	21 (16.2)		
Year 5	0 (0.0)	0 (0.0)	3 (7.0)	38 (88.4)	2 (4.7)		
Residence						0.027	0.016
Hostellers	1 (0.5)	2 (1.1)	30 (16.2)	128 (69.2)	24 (13.0)		
Non-hostellers	0 (0.0)	0 (0.0)	4 (4.8)	58 (69.9)	21 (25.3)		
Education Background						0.241	-
A Level	0 (0.0)	0 (0.0)	0 (0.0)	7 (100.0)	0 (0.0)		
Diploma	0 (0.0)	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)		
Foundation	1 (0.4)	1 (0.4)	30 (13.0)	156 (67.8)	42 (18.3)		
STPM	0 (0.0)	1 (3.8)	3 (11.5)	20 (76.9)	2 (7.7)		

A statistically significant difference was observed between the response to question regarding the belief of ALS patients' lives should be ended by a lethal medication instead of letting them suffer throughout their lives with gender ($p=0.025$) variable. The positive attitude was more among the male students. A weak positive association ($\phi=0.013$) was observed between gender variable and the response of the students. Similarly, a statistically significant difference was observed between the response to question regarding the belief that there is a lot of information and research needed better to understand ALS with gender ($p=0.015$) variable. The positive attitude was more among the female students. A moderate positive association ($\phi=0.021$) was observed between gender and the response of the students. The current study

results were different from a study conducted by Woelfel and colleagues where female students had a more positive attitude compared to the males towards ALS [15].

Healthcare education is vital in improving the overall healthcare standards of the general populace of a country. Students studying in various healthcare programs can play a significant role in disease management and prevention. As future healthcare providers, healthcare students are the most prominent stakeholder in the healthcare system of a country where they provide optimum healthcare to the public after they graduate. Provision of prime healthcare education to them often helps them better understand drug-disease knowledge and excellent patient care [16-19].

Table 3. Attitude towards question 3 N (%)

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	P-value	Effect size
Gender						0.039	0.011
Male	2 (2.4)	2 (2.4)	14 (16.5)	42 (49.4)	25 (29.4)		
Female	3 (1.6)	4 (2.2)	29 (15.8)	88 (48.1)	59 (32.2)		
Race						0.562	-
Malay	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	1 (50.0)		
Chinese	2 (1.1)	4 (2.1)	31 (16.3)	92 (48.4)	61 (32.1)		
Indian	3 (4.0)	2 (2.7)	11 (14.7)	37 (49.3)	22 (29.3)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Faculty						0.561	-
Medical	2 (2.4)	4 (4.8)	11 (13.3)	42 (50.6)	24 (28.9)		
Pharmacy	2 (2.0)	2 (2.0)	23 (23.0)	40 (40.0)	33 (33.0)		
Dental	1 (1.2)	0 (0.0)	9 (10.6)	48 (56.5)	27 (31.8)		
Age						0.877	-
20-25	5 (1.9)	4 (1.5)	43 (16.4)	129 (49.2)	81 (30.9)		
26-30	0 (0.0)	2 (40.0)	0 (0.0)	1 (20.0)	2 (40.0)		
More than 30	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)		
Year of Education						0.656	-
Year 3							
Year 4	2 (2.1)	3 (3.2)	20 (21.1)	38 (40.0)	32 (33.7)		
Year 5	3 (2.3)	3 (2.3)	21 (16.2)	64 (49.2)	39 (30.0)		
	0 (0.0)	0 (0.0)	2 (4.7)	28 (65.1)	13 (30.2)		
Residence						0.035	0.010
Hostellers	4 (2.2)	6 (3.2)	30 (16.2)	93 (50.3)	52 (28.1)		
Non-hostellers	1 (1.2)	0 (0.0)	13 (15.7)	37 (44.6)	32 (38.6)		
Education Background						0.459	-
A Level							
Diploma	0 (0.0)	0 (0.0)	1 (14.3)	5 (71.4)	1 (14.3)		
Foundation	0 (0.0)	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)		
STPM	5 (2.2)	6 (2.6)	34 (14.8)	105 (45.7)	80 (34.8)		
	0 (0.0)	0 (0.0)	7 (26.9)	17 (65.4)	2 (7.7)		

Table 4. Attitude towards question 4 N (%)

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	P-value	Effect size
Gender						0.025	0.013
Male	10 (11.8)	23 (27.1)	34 (40.0)	15 (17.6)	3 (3.5)		
Female	39 (21.3)	49 (26.8)	71 (38.8)	19 (10.4)	5 (2.7)		
Race						0.654	-
Malay	1 (50.0)	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Chinese	36 (18.9)	50 (26.3)	78 (41.1)	22 (11.6)	4 (2.1)		
Indian	12 (16.0)	21 (28.0)	27 (36.0)	11 (14.7)	4 (5.3)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Faculty						0.891	-
Medical	20 (24.1)	19 (22.9)	27 (32.5)	13 (15.7)	4 (4.8)		
Pharmacy	18 (18.0)	28 (28.0)	38 (38.0)	14 (14.0)	2 (2.0)		
Dental	11 (12.9)	25 (29.4)	40 (47.1)	7 (8.2)	2 (2.4)		
Age						0.327	-
20-25	46 (17.6)	69 (26.3)	105 (40.1)	34 (13.0)	8 (3.1)		
26-30	2 (40.0)	3 (60.0)	0 (0.0)	0 (0.0)	0 (0.0)		
More than 30	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Year of Education						0.756	-
Year 3							
Year 4	20 (21.1)	23 (24.2)	38 (40.0)	11 (11.6)	3 (3.2)		
Year 5	24 (18.5)	36 (27.7)	45 (34.6)	20 (15.4)	5 (3.8)		
	5 (11.6)	13 (30.2)	22 (51.2)	3 (7.0)	0 (0.0)		
Residence						0.329	-
Hostellers	38 (20.5)	49 (26.5)	72 (38.9)	23 (12.4)	3 (1.6)		
Non-hostellers	11 (13.3)	23 (27.7)	33 (39.8)	11 (13.3)	5 (6.0)		
Education Background						0.769	-
A Level							
Diploma	1 (14.3)	2 (28.6)	3 (42.9)	1 (14.3)	0 (0.0)		
Foundation	1 (20.0)	1 (20.0)	2 (40.0)	1 (20.0)	0 (0.0)		
STPM	42 (18.3)	62 (27.0)	88 (38.3)	30 (13.0)	8 (3.5)		
	5 (19.2)	7 (26.9)	12 (46.2)	2 (7.7)	0 (0.0)		

Table 5. Attitude towards question 5 N (%)

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	P-value	Effect size
Gender						0.015	0.021
Male	2 (2.4)	4 (4.7)	38 (44.7)	38 (44.7)	3 (3.5)		
Female	2 (1.1)	9 (4.9)	65 (35.5)	81 (44.3)	26 (14.2)		
Race						0.214	-
Malay	1 (50.0)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)		
Chinese	2 (1.1)	11 (5.8)	71 (37.4)	88 (46.3)	18 (9.5)		
Indian	1 (1.3)	2 (2.7)	31 (41.3)	30 (40.0)	11 (14.7)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Faculty						0.008	0.015
Medical	2 (2.4)	3 (3.6)	23 (27.7)	49 (59.0)	6 (7.2)		
Pharmacy	1 (1.0)	2 (2.0)	36 (36.0)	44 (44.0)	17 (17.0)		
Dental	1 (1.2)	8 (9.4)	44 (51.8)	26 (30.6)	6 (7.1)		
Age						0.365	-
20-25	4 (1.5)	13 (5.0)	101 (38.5)	115 (43.9)	29 (11.1)		
26-30	0 (0.0)	0 (0.0)	2 (40.0)	3 (60.0)	0 (0.0)		
More than 30	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)		
Year of Education						0.534	-
Year 3							
Year 4	2 (2.1)	4 (4.2)	39 (41.1)	37 (38.9)	13 (13.7)		
Year 5	2 (1.5)	5 (3.8)	43 (33.1)	67 (51.5)	13 (10.0)		
	0 (0.0)	4 (9.3)	21 (48.8)	15 (34.9)	3 (7.0)		
Residence						0.809	-
Hostellers	3 (1.6)	10 (5.4)	73 (39.5)	79 (42.7)	20 (10.8)		
Non-hostellers	1 (1.2)	3 (3.6)	30 (36.1)	40 (48.2)	9 (10.8)		
Education Background						0.431	-
A Level							
Diploma	0 (0.0)	0 (0.0)	1 (14.3)	6 (85.7)	0 (0.0)		
Foundation	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)	0 (0.0)		
STPM	3 (1.3)	12 (5.2)	88 (38.3)	99 (43.0)	28 (12.2)		
	1 (3.8)	0 (0.0)	11 (42.3)	13 (50.0)	1 (3.8)		

Best healthcare education also enables them to better understand their patients' physical, psychological, social, environmental, and emotional aspects while treating their ailments. Up-to-date healthcare knowledge, broader disease awareness, and adopting evidence-based practices are crucial for treating various diseases and maintaining patients' overall health state. Furthermore, healthcare education also plays a vital role in enhancing individuals' quality of life in particular and society in general [20-23]. There are certain limitations of the current study. This study was performed at one university only, so this study's findings cannot be generalized to other universities all over Malaysia.

5. CONCLUSION

The present study reported mixed findings regarding the attitude towards ALS among the studied cohort of university students. The pharmacy faculty students had a more positive attitude towards ALS than the rest.

CONSENT AND ETHICAL APPROVAL

All the respondents signed the informed consent form before getting into the study as participants. The ethical approval of the study was obtained from the ethics committee of the university.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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