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Malay Public Attitudes Toward Epilepsy (PATE) scale: Translation and psychometric evaluation ☆

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ABSTRACT

Introduction: None of the quantitative scales for public attitudes toward epilepsy had been translated to Malay language. This study aimed to translate and test the validity and reliability of a Malay version of the Public Attitudes Toward Epilepsy (PATE) scale.
Method: The translation was performed according to standard principles and tested in 140 Malay-speaking adults aged more than 18 years for psychometric validation.
Results: The items in each domain had similar standard deviations (equal item variance), ranging from 0.90 to 1.00 in the personal domain and from 0.87 to 1.23 in the general domain. The correlation between an item and its domain was 0.4 and above for all items and was higher than the correlation with the other domain. Multitrait analysis showed that the Malay PATE had a similar variance, floor and ceiling effects, and relative relationship between the domains as the original PATE. The Malay PATE scale showed a similar correlation with almost all demographic variables except age. Item means were generally clustered in the factor analysis as the hypothesized domains, except those for items 1 and 2. The Cronbach's α values were within acceptable range (0.757 and 0.716 for the general and personal domains, respectively).
Conclusion: The Malay PATE scale is a validated and reliable translated version for measuring public attitudes toward epilepsy.

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1. Introduction

People with epilepsy are burdened by a multitude of social, psychological, and economic consequences of stigmatization which lead to poor quality of life [1,2]. There are great variations in social stigma among the various countries, ethnicities, and cultural groups affected by various socioeconomic and cultural factors. Assessment of public attitudes toward epilepsy is therefore best conducted in local languages.

The majority of the Malaysian population is Malay (50.4%), and most Malaysians speak the Malay language, which is the national language. Surveys in the Malay language on public attitudes toward epilepsy in Malaysians had been performed previously [3,4]. However, a standard and quantitative scale was not used in these studies, resulting in difficulty in comparing the results [5].

There are a few quantitative assessment tools for public attitudes toward epilepsy, such as the Attitudes and Beliefs about Living with Epilepsy (ABLE) scale [6], the Attitudes Toward Persons with Epilepsy (ATPE) [7,8], the Epilepsy Attitude Scale [9], and the Elementary School Epilepsy Survey (ESES) [10] for elementary school children, but not all can be applied cross-culturally as these assessment tools are limited by items related to local perceptions of epilepsy, and none of these tools had been translated into the Malay language. The Public Attitudes Toward Epilepsy (PATE) scale was designed to be applied cross-culturally, as (1) it includes statements related to separation and disadvantages in Link's stigmatization model [11], which are universally applicable, and (2) it excludes questions testing the participants' knowledge and perception of epilepsy, which are culturally dependent.

The aim of this study was to test the validity and reliability of a Malay version of the Public Attitudes Toward Epilepsy (PATE) scale.

2. Methodology

The Public Attitudes Toward Epilepsy (PATE) scale is a two-dimensional 14-item scale measuring public attitudes toward epilepsy [5]. The two dimensions which the scale measures are (1) the personal dimension/domain, which includes items that require participants to consider personal involvement and commitment with sufferers of epilepsy, and (2) the general domain, which includes a general opinion of

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patients with epilepsy. Each item on the PATE scale is scored using a 5-point Likert scale with 1 being "strongly disagree" and 5 being "strongly agree". A higher total score reflects more negative attitudes toward epilepsy. The PATE scale is a valid and reliable test instrument, demonstrating appropriate content and construct validity. Cronbach's coefficient was reported to be 0.633 and 0.868 for each respective dimension.

The translation process of the PATE scale was performed using a three-stage cross-cultural adaptation process as developed by the International Quality of Life Assessment project [12]; this process includes the following steps: (1) translation and cultural adaptation of the original scale in English into the Malay language and evaluation to ensure conceptual equivalence, (2) formal psychometric testing of the assumptions underlying item scoring and construction of multi-item scales to ensure that the scoring algorithms can be applied to the population concerned, and (3) validation and norming studies that provide a basis for interpretation.

2.1. Participants

Ten Malay-speaking adults from various socioeconomic backgrounds were included in the translation and cultural adaptation process. For psychometric validation, 140 Malay-speaking adults aged more than 18 years from a wide range of age and socioeconomic background were enrolled through convenience sampling. Samples were recruited from Petaling Jaya and Kuala Lumpur, the two most populous and culturally diverse cities in Malaysia. All questionnaires were self-reported and administered anonymously. Consent was obtained when participants responded to the questionnaire. Demographic information, such as age, gender, education level, and social strata by occupation, was also obtained. This study was approved by the ethics committee of the institutional review board (MEC Ref No.: 878.10).

2.2. Translation and cultural adaptation

The Malay translation of the PATE scale was performed according to the Principles of Good Practice Translation and Cultural Adaptation of Patient-Reported Outcomes Measures [13], which include preparation, forward translation and reconciliation, backward translation, harmonization, cognitive debriefing, and finalization. With these principles, the aim was to develop a culturally sensitive version of the scale that was equivalent to the original in the following aspects: item, semantic, and operational and measurement equivalence.

2.2.1. Translation

The PATE scale was first transferred to an Excel file for translation. Forward translation was performed by two independent translators, and the two translations were reconciled into a single form. The reconciled form was backtranslated into English by two independent translators and combined into one backtranslation. The backtranslation was compared with the original version. Differences were highlighted and discussed by a panel consisting of two neurologists, a psychologist, and a statistician, and changes were made accordingly to ensure consistency in the concepts between the original and the translations. This resulted in the Malay translated versions of PATE.

2.2.2. Cognitive debriefing

To pretest the questionnaire, semistructured interviews were conducted with 10 Malay-speaking participants. The interviews explored the questions' relevancy and understandability besides identifying potential difficulties in responding.

2.2.3. Finalization

An expert panel meeting was organized to evaluate the content and face validity of the translated versions, the results of the pretesting, and the equivalence with the original, i.e., conceptual, semantic, and normative equivalence for each item.

2.3. Statistical analysis

All data analyses were performed using Statistical Package for Social Sciences version 19 (SPSS 19.0). All demographic data were analyzed descriptively and presented as frequencies and percentages. For continuous data with normal distribution, independent t-tests were used for group comparison.

2.4. Psychometric and validation testing

2.4.1. Validity

Multitrait analysis and principal-axis factoring were used to evaluate the validity of the translation based on the following assumptions:

1. Equal item variance: Items measuring the same concept should have approximately equal variances (standard deviations).
2. Convergent validity: Items in a given scale should contain approximately the same proportion of information about a concept, with roughly equal item-total correlation.
3. Discriminant validity: An item should correlate higher with its hypothesized scale than with scales measuring other concepts, tested with correlation analysis.
4. Construct validity: The construct of the translated version, as assessed by principal-axis factor analysis, should be similar to that of the initial study. In addition, it was hypothesized that (a) the scale means and standard deviations and floor and ceiling effects of this translation and (b) the relative relationship between the personal and general domain were comparable to the initial results of the PATE scale in the Malaysian population [5]. The correlation between the mean score of each domain and the demographic variables was also assessed with the hypothesis that the current study should have similar correlation patterns as reported previously [5].

2.4.2. Reliability

Item analysis was performed to assess the internal consistency of the overall scale and its components. Cronbach's α values of 0.7 to 0.9 were considered acceptable [14], whereas values of 0.6 to 0.7 were considered satisfactory. Mean inter-item correlation was used if α values were below 0.7, and values in the range of 0.2 to 0.4 were used to ensure that items were measuring the same construct [15]. An item-total correlation of 0.3 and above was used to indicate that the item correlated well with the scale overall [16].

3. Results

One hundred and forty Malay-speaking adults with a mean age of 36.4 years (SD: 13.4 and range: 16–78) were recruited. There were slightly more females in the sample. The samples were predominantly of Malay ethnicity and married. Approximately two-thirds of the participants had tertiary education level and full-time employment. About 5.7% of the participants had a family history of epilepsy (Table 1).

3.1. Translation equivalence and acceptability

The backtranslation of the Malay PATE was equivalent to the original PATE for all the questions and responses, except for item 5. For item 5, the equivalent Malay translation for dating is "kencan" which is not a commonly used terminology among Malaysians. A more commonly used terminology is "*temujanji*" which can be interpreted as "dating" or "making an appointment". The phrase "(date) with someone" was thus added to the verb to make the meaning more explicit. All 10 participants involved in the cognitive debriefing indicated that the items were relevant and easy to understand and that they had no difficulty in answering the questions. No change was made to the reconciled Malay translation of the scale in the final expert panel meeting.

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Table 1
Demographic characteristics of the respondents (n = 140).

Characteristics	Frequency (%)
Age	36.4 (13.4)[a]
Gender	
Male	65 (46.4)
Female	75 (53.6)
Race	
Malay	117 (83.6)
Chinese	2 (1.4)
Indian	17 (12.1)
Others	4 (2.9)
Marital status	
Married	92 (65.7)
Single	42 (30.0)
Widowed	4 (2.9)
Divorced	2 (1.4)
Education level	
None or primary education	2 (1.4)
Secondary	54 (38.6)
Pre-university	42 (30.0)
Degree	37 (26.4)
Postgraduate	5 (3.6)
Employment status	17 (12.1)
Full-time student	11 (7.9)
Housewife	7 (5.0)
Employed part-time	84 (60.0)
Employed full-time	6 (4.3)
Unemployed	11 (7.9)
Retired	4 (2.9)
Others	
Individual monthly income (Ringgit Malaysia)	
1000 and below	33 (23.9)
1001–2000	46 (32.9)
2001 and above	61 (43.6)
Family member with epilepsy/seizures	8 (5.7)

[a] Reported as mean (standard deviation).

3.2. Psychometric and validation testing

1. Equal item variance
   The mean score and standard deviation (SD) and floor and ceiling effects of each item in the Malay PATE scale were shown in Table 2, according to the domain, and were compared to the results performed in the initial study [5]. The items in each domain had similar standard deviations (equal item variance), ranging from 0.90 to 1.00 in the personal domain and 0.87 to 1.23 in the general domain (Table 2).
2. Convergent and discriminant validity
   The correlation between an item and its domain was 0.4 and above for all items and was higher than the correlation with the other domain, as highlighted in bold in Table 3.
3. Construct validity

   a) Compatibility with the previous study
   The scale means and standard deviations and the floor and ceiling effects of the Malay PATE scale were compared with the initial results in the Malaysian general population in Table 2. Compared to the means of the original PATE scale, the means of 4 items (1, 2, 3, and 7) in the personal domain were significantly lower and the means of 3 items (12, 13, and 14) in the general domain were significantly higher. The standard deviations were slightly higher but comparable between the two groups. The floor and ceiling effects followed the same pattern as those of the initial study, in which the floor effect was greater than the ceiling effect in all items. In addition, the floor effect in all items in the Malay PATE scale was greater than that of the original study.
   As shown in Table 2, the mean score in the personal domain of the Malay PATE scale was significantly lower than that in the initial study ($p < 0.001$). The relative relationship between the personal and general domains was similar between the Malay PATE scale and the initial PATE scale.

   b) Correlation of mean scores with demographic characteristics
   The mean scores in the general domain were significantly lower in females, those with tertiary education, and those with a monthly income of RM 2000 and above ($p < 0.05$), but there was no correlation with marital status, employment status, and family history. For the personal domain, there were no significant correlations between the mean scores and all demographic factors (Table 4).

   c) Correlation between the items and rotated principal components
   Table 5 showed the factor loadings of the items using a principal-axis factor analysis and their correlation with the hypothesized domain. The results fit the hypothesized personal and general domains, except for items 1 and 2 which had a higher loading on the general domain than the hypothesized domain with a difference of more than 0.2 (0.563 and 0.237, respectively).

Table 2
Mean score, SD, and floor and ceiling effects of the Malay PATE scale compared with the results of the initial study performed in a Malaysian population [5].

ID	Item	Mean (SD)		Floor/ceiling effects (%)	
		Malay PATE scale (n = 140)	General populations (n = 130)	Malay PATE scale (n = 140)	General populations (n = 130)
	Personal domain	2.37 (0.64)***	2.72 (0.56)		
1	I feel uncomfortable working with someone who has epilepsy.	2.06 (0.90)**	2.42 (0.87)	25.0/2.1	10.8/1.5
2	I will advise my family members against marrying someone with epilepsy.	2.51 (1.00)***	2.95 (0.91)	15.7/2.1	6.9/2.3
3	I would marry someone with epilepsy, even though he/she has epilepsy.[a]	2.76 (0.91)*	3.03 (0.85)	7.9/3.6	2.3/3.8
5	I would date someone even though he/she has epilepsy.[a]	2.62 (0.92)	2.78 (0.84)	8.6/2.9	3.1/3.1
7	If I am an employer, I would give equal employment opportunities to someone with epilepsy.[a]	1.89 (0.93)***	2.41 (0.96)	37.1/2.1	10.8/4.6
	General domain	2.09 (0.59)	2.09 (0.59)		
4	I will not mind being seen in the company with someone known to have epilepsy.[a]	1.99 (1.01)	2.06 (0.77)	32.1/5.0	16.9/1.5
6	I would stay away from a friend if I knew she/he had epilepsy.	1.74 (0.91)**	2.08 (0.92)	45.7/2.9	21.5/3.8
8	People with epilepsy have the same rights as all people.[a]	1.82 (1.01)	2.05 (0.91)	42.9/5.0	26.2/2.3
9	People with epilepsy should be isolated from others.	1.84 (0.87)	1.94 (0.84)	39.3/0.7	32.3/0.8
10	People with epilepsy should not marry.	1.91 (0.87)	2.06 (0.78)	35.7/0.7	22.3/0.8
11	People with epilepsy should not participate in social activities.	1.97 (0.98)	2.00 (0.78)	38.6/10.0	22.3/0.8
12	People with epilepsy should not study in college or university.	2.05 (1.00)*	1.82 (0.70)	30.7/3.6	32.3/0.8
13	People with epilepsy should study in a special school.	2.76 (1.23)*	2.43 (0.97)	17.1/9.3	16.9/1.5
14	Schools should not place children with epilepsy in regular classrooms.	2.74 (1.13)**	2.35 (0.90)	14.3/5.0	13.8/2.3

Significant at *$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$ compared to the results of the initial study performed among a Malaysian population.
[a] These items were reversely scored.

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Table 3
Item–domain and corrected item-total correlations.

ID	Correlation	Personal domain	General domain	Corrected item-total correlation
1	I feel uncomfortable working with someone who has epilepsy.	**.636****	.587**	.440
2	I will advise my family members against marrying someone with epilepsy.	**.653****	.390**	.439
3	I would marry someone with epilepsy, even though he/she has epilepsy.[a]	**.755****	.380**	.610
5	I would date someone even though he/she has epilepsy.[a]	**.737****	.213*	.526
7	If I am an employer, I would give equal employment opportunities to someone with epilepsy.[a]	**.632****	.343**	.371
4	I will not mind being seen in the company with someone known to have epilepsy.[a]	.366**	**.567****	.295
6	I would stay away from a friend if I knew she/he had epilepsy.	.413**	**.614****	.458
8	People with epilepsy have the same rights as all people.[a]	.316**	**.539****	.336
9	People with epilepsy should be isolated from others.	.396**	**.696****	.637
10	People with epilepsy should not marry.	.435**	**.547****	.450
11	People with epilepsy should not participate in social activities.	.292**	**.607****	.467
12	People with epilepsy should not study in college or university.	.377**	**.674****	.506
13	People with epilepsy should study in a special school.	.318**	**.618****	.435
14	Schools should not place children with epilepsy in regular classrooms.	.156	**.561****	.399

Significant at $^{*}p < 0.05$ and $^{**}p < 0.001$. Numbers in bold indicate that the correlation of the item is higher with its hypothesized scale than with scales measuring other concepts.
[a] These items were reversely scored.

3.3. Reliability

The Cronbach's α values of both domains were within acceptable range (0.7 to 0.9), i.e., 0.757 for the general domain and 0.716 for the personal domain. The mean inter-item correlations for both the general and personal domains were within the range of 0.2 to 0.4 (0.265 and 0.338, respectively). The mean scores of both the general and personal domains had a strong correlation with the total mean score, with a correlation coefficient of 0.919 and 0.782, respectively ($p < 0.001$). The corrected item-total correlation of all items was 0.3 and above, except for item 4 with a correlation coefficient of 0.295 (Table 3).

4. Discussion

This study showed that the Malay PATE scale is a reliable content- and construct-validated translated version, which was translated according to standard principles [13] and tested with multitrait analysis and principal-axis factor analysis, with an acceptable internal consistency with acceptable Cronbach's α values for the general and personal domains.

Though a convenience sampling was employed in this study, an attempt to recruit participants with a wide range of age (16–78 years) and socioeconomic status and with equal gender representation was made; the mean age of this cohort was compatible to that of the initial cohort [5] (36.4 vs. 41.4 years, respectively). This will ease the generalization of the results to the general Malay population from the same region.

A modification to item 5 was made because the Malay translation for "dating" in the Malaysian context can be interpreted as either dating or making an appointment. The mean score and standard deviation of this item were compatible with other items within the same domain and the original study, indicating that the modified item is measuring the same concept. The translated version had fulfilled the criteria for equal item variance and convergent and discriminant validity.

Multitrait analysis showed that the Malay PATE scale had similar variance, floor and ceiling effects (Table 2), and relative relationship between the domains as the original PATE scale. All items in the Malay PATE scale had greater floor effects; this is likely because the attitudes toward epilepsy among the Malay-speaking population were better than that of the general population. All items in the translated version had greater floor effects than ceiling effects, compatible to the original PATE study.

The Malay PATE scale showed a similar correlation with almost all demographic variables as the original study, except for gender and monthly income. In this study, females and those with higher monthly income had significantly more positive attitudes toward epilepsy in relation to the items in the general domain, which was not found in the original study.

The deviation of items 1 and 2 from the hypothesized domain with a difference of more than 0.2 compared to the factor loading in the other

Table 4
Mean scores by domains and demographic characteristics (n = 140).

Variable		General domain	Personal domain	Total
Age[a]		0.110	0.105	0.106
Variable	Group (n)	Mean score (SD)	Mean score (SD)	Mean score (SD)
Gender	Male (65)	2.25 (0.53)	2.44 (0.58)	2.32 (0.48)
	Female (75)	1.95 (0.60)**	2.31 (0.68)	2.08 (0.57)**
Marital status	Single (42)	2.14 (0.58)	2.46 (0.53)	2.25 (0.49)
	Others (98)	2.07 (0.59)	2.33 (0.68)	2.16 (0.56)
Education level	Tertiary (84)	1.99 (0.58)	2.34 (0.67)	2.12 (0.55)
	Others (56)	2.23 (0.57)*[b]	2.42 (0.59)	2.30 (0.50)
Employment status	Employed full time (84)	2.10 (0.57)	2.34 (0.59)	2.18 (0.52)
	Others (56)	2.08 (0.61)	2.41 (0.71)	2.20 (0.58)
Monthly income in Ringgit Malaysia	2000 and above (61)	1.96 (0.54)	2.36 (0.70)	2.10 (0.53)
	Others (79)	2.19 (0.60)*	2.38 (0.59)	2.26 (0.54)
Family member with epilepsy/seizures	Yes (8)	1.99 (0.38)	2.30 (0.39)	2.10 (0.29)
	No (132)	2.10 (0.60)	2.37 (0.65)	2.20 (0.55)

Significant at $^{*}p < 0.05$; $p < 0.01$.
[a] Based on Pearson correlation.
[b] This difference was comparable to the initial PATE study.

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Table 5
Correlation between the hypothesized domain and the rotated principal components.

ID	Item	Hypothesized domain	Factor	
			General	Personal
9	People with epilepsy should be isolated from others.	General	.699	.045
12	People with epilepsy should not study in college or university.	General	.603	−.009
14	Schools should not place children with epilepsy in regular classrooms.	General	.560	−.211
6	I would stay away from a friend if I knew she/he has epilepsy.	General	.556	.034
11	People with epilepsy should not participate in social activities.	General	.551	−.006
10	People with epilepsy should not marry.	General	.512	.137
13	People with epilepsy should study in a special school.	General	.499	−.026
8	People with epilepsy have the same rights as all people.	General	.344	.043
4	I will not mind being seen in the company with someone known to have epilepsy.	General	.312	.039
1	I feel uncomfortable working with someone who has epilepsy.	Personal	.661	.098
2	I will advise my family members against marrying someone with epilepsy.	Personal	.430	.193
5	I would date someone even though he/she has epilepsy.	Personal	−.087	.813
3	I would marry someone with epilepsy, even though he/she has epilepsy.	Personal	.179	.657
7	If I am an employer, I would give equal employment opportunities to someone with epilepsy.	Personal	.151	.442

Extraction method: principal-axis factoring. Rotation method: oblimin with Kaiser normalization.

domain (Table 5) resulted in a reexamination of the concepts of these two items. Item 1 (I feel uncomfortable working with someone who has epilepsy) almost had a similar correlation with both the personal and general domains (0.636 and 0.587, respectively, as shown in Table 3). Conceptually, item 1 can be included into either domain depending on how close the relationship is among coworkers. For example, if a person is working in a big company, having a coworker who has epilepsy does not have much impact on his life, and thus, item 1 may not necessarily be categorized as personal. Item 2 (I will advise my family members against marrying someone with epilepsy) had a strong item–domain correlation (Table 3). The panel also viewed that for the local Malay population, which formed the majority (83.6%) of the respondents in this study, this item is consistent with the concept in the personal domain. However, personal opinion against a family member marrying a person with epilepsy can be overridden by the paternal authority in the family among the Malay population. However, in order to maintain the consistency of comparison among various translated versions of the PATE scale, no change in the factoring of these two items was made, but a note was added to this translated version, stating that factoring of these two items can be culturally dependent.

The reliability of the Malay PATE scale was confirmed by a Cronbach's α value that was within acceptable range. In addition, the mean inter-item correlations were within the acceptable range, and all corrected item-total correlations were above 0.3, indicating that this translated version is a reliable tool in measuring public attitudes toward epilepsy.

5. Limitations and future implications

This Malay-translated version of the PATE scale was tested among a multiethnic group from a Malay-speaking Malaysian population in the urban region comprised predominantly of Malays. The Malay language was the second language of those who are not Malay. However, it was an advantage to have multiple ethnic group involvement in the translation and adaptation process to ensure the cross-cultural validity of this translated version. In Malaysia and some of the Southeast Asian countries, e.g., Indonesia, the Malay language is a common second language used even in indigenous groups. The Malay-translated PATE scale will enable us to understand public attitudes toward epilepsy among this population group.

6. Conclusion

The Malay PATE scale is a validated and reliable translated version for measuring public attitudes toward epilepsy.

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