Article

Public Perception of Epilepsy in Rural Limpopo and Mpumalanga Provinces: A Quantitative Study on Knowledge, Awareness, and Attitudes

Ofhani Prudence Musekwa [1,*], Lufuno Makhado [2] and Angelina Maphula [1]

[1] Department of Psychology, Faculty of Health Science, University of Venda, University Road, Thohoyandou 0950, South Africa
[2] Department of Public Health, Faculty of Health Science, University of Venda, University Road, Thohoyandou 0950, South Africa
* Correspondence: ofhanimusekwa@gmail.com; Tel.: +27-814401071

Abstract: Although epilepsy is a common non-communicable neurological disease, lack of knowledge, awareness, and negative attitudes of it abound. This study aimed to explore public awareness, knowledge, and attitudes towards epilepsy and people living with epilepsy (PLWE). RaoSoft software was used to calculate the sample size, and 4290 respondents were included. The researchers employed a non-experimental quantitative survey method. Data were collected using a questionnaire, and descriptive and regression analyses were performed. Most respondents had a secondary education without grade 12 (45.2%); 79.6% were unemployed in Limpopo and 70.5% in Mpumalanga. This study had a 95.3% response rate. Both provinces displayed low knowledge of epilepsy (48.2%; mean = 5.99; SD = 2.38). Only 41% demonstrated awareness, and 56.7% had a positive attitude towards epilepsy (mean= 4.67; SD = 1.90). The findings revealed positive correlations between demographic factors and overall knowledge, awareness, and attitude. In addition, demographic factors, such as level of education and employment status, may be associated with an individual's knowledge, awareness, and attitudes towards epilepsy. This study concluded that, despite individuals' awareness of epilepsy, their levels of knowledge were low, and many (43.3%) had a negative attitude regarding the disease. In the two provinces investigated, the study highlighted the need for epilepsy education to empower the public and improve the quality of life of PLWE and their families.

Keywords: epilepsy; people living with epilepsy (PLWE); rural; knowledge; awareness; attitude

1. Introduction

Epilepsy is a global health burden, affecting over 50 million people worldwide [1,2]. Looking at global statistics, poor knowledge of epilepsy varies between 40% and 80%, and negative attitudes toward people living with epilepsy (PLWE) range between 28% and 87% [3]. There is a lack of knowledge and understanding of epilepsy as portrayed in Ethiopia and South India [3,4]. In Thailand, Malaysia, and Ethiopia, there is a general lack of knowledge and awareness and negative attitudes toward epilepsy [3,5,6], and similarly in Nigeria and South Africa [7,8].

One in one hundred people in South Africa has epilepsy [9], making it a disorder of interest and possibly one of the most commonly misunderstood neurological disorders. Little or no effort has been made to educate the public and reduce these misconceptions, including education about the nature, cause, and treatment of epilepsy, especially in developing countries.

The lack of knowledge and awareness of epilepsy in most African countries, including South Africa, poses an unnecessary danger to PLWE, which could be minimized if epilepsy education was prioritised. Correct public knowledge is essential to improve the lives of PLWE for first aid emergencies and preventing sudden unexpected death.

Several authors have advocated for public education initiatives that increase knowledge and awareness and decrease the burdens associated with epilepsy [10,11]. Evidence-based interventions and campaigns must be administered to improve health-related quality of life amongst PLWE and their families [11]. However, assessing current knowledge, awareness, and attitudes towards epilepsy is vital before developing impactful educational programmes. As we could find no evidence of research into these aspects of epilepsy in South Africa's Limpopo and Mpumalanga provinces, this study focused on those two regions. This current study explores the knowledge, awareness, and attitudes held by the public, PLWE and their families, and health care providers to generate contextual findings that would contribute towards epilepsy education and interventions while reducing the burden and stigma associated with epilepsy.

2. Materials and Methods

The researchers employed a non-experimental quantitative survey method. The diversity in people groups in Limpopo and Mpumalanga is representative of cultures found within South Africa, hence the chosen study setting. Purposive sampling was applied to select districts, municipalities, and local communities to achieve a heterogeneous sample. Malavuwe, Mutititi, and Bochum are the communities within Limpopo that formed part of the study. In Mpumalanga, Clare, Jerusalem, and Acornhoek were included. All cultures found within Limpopo and Mpumalanga province residing in the communities above had an equal chance for participation. Only young adults (above 18), adults, and seniors were eligible for inclusion.

Before data collection, the researchers negotiated with the royal leaders of the selected communities about conducting the study and partnering with the researchers. Once an agreement was reached, they offered home-based carers to the researchers to take on the role of research assistants. Each community home-based carer was trained in administering the questionnaire (to assist those who could not read or write) and in the overall data collection process, including observing COVID-19 regulations. All selected community members had an opportunity to agree to participate/withdraw from the study independently. However, those that agreed to participate were given an information sheet and were required to sign a consent form.

The data collection tool was translated from English into Sepedi, Sehananwa, Xitsonga, and Tshivenda. The questionnaire comprised four sections: socio-demographic data, epilepsy knowledge, attitudes and awareness, and practices and knowledge. Overall, 13 questions targeted knowledge, from which any score below 6.5 was equated with low levels of knowledge. An average score (6.5) or any above 7 indicated a high to moderate level of knowledge. Three questions focused directly on attitudes, and a score of 2 and above represented a positive attitude, while scores below 2 depicted negative attitudes. Ten questions focused on epilepsy awareness; individuals scoring below 5 were deemed unaware, those scoring an average of 5 were somewhat aware, and any score above 5 (6 and higher) showed they were aware.

Raosoft was used to calculate the total sample size from each community based on the total population, arriving at a figure of 4500, and community members were selected randomly for participation. However, of the 4500, only 4290 respondents consented to participate in the study.

Statistical Package of Social Sciences (SPSS) software version 26.0 was used for data analysis. The researchers used Chi-square cross-tabulation analysis by province and descriptive statistics looking at the mean and standard deviation. Pearson correlation analysis was also performed on the data. Furthermore, a backward regression approach was applied to indicate which variables may play a part in predicting levels of knowledge, awareness, and attitude.

To ensure content validity, the researchers submitted the questionnaire for review to health professionals and the Department of Health for research reliability. Pre-testing was done in Bochum on 25 respondents who were not involved in the final study.

3. Results

This study had a 95.3% response rate. The demographic characteristics of the included respondents are illustrated in Table 1. The majority of respondents were females (61% in Limpopo and 59.4% in Mpumalanga). Fifty-six percent were Tsonga, 40.4% were Swati, and the remaining 3.6% was distributed relatively evenly between Venda, Northern Sotho/Pedi, Ndebele, Afrikaans, Zulu, Southern Sotho, and Coloured ethnic groups. Respondents reported having secondary education without Grade 12 (43.9%), 76.7% were unemployed, 76% were Christian, and 21.07% were traditional faith believers.

Table 1. Demographic characteristics of community members.

		Limpopo (N = 2930)		Mpumalanga (N = 1360)		X² (*p*-Value)
		n	%	N	%	
Gender	Female	1786	61.0	808	59.4	2.54
	Male	1143	39.0	550	40.4	(*p* = 0.281)
	Other	1	0.0	2	0.1	
Ethnicity	Northern Sotho/Pedi	914	31.2	27	2.0	2191.43
	Swati	3	0.1	549	40.4	
	Ndebele	14	0.5	6	0.4	
	Venda	1050	35.8	2	0.1	
	Tsonga	895	30.5	762	56.0	(*p* < 0.001)
	Afrikaans	4	0.1	2	0.1	
	Zulu	3	0.1	5	0.4	
	Southern Sotho	46	1.6	4	0.3	
	Coloured	0	0	2	0.1	
	Other	1	0.0	1	0.1	
Level of education	No formal education	612	20.9	156	11.5	
	Primary education	604	20.6	355	26.1	83.23
	Secondary education without Grade 12	1220	41.6	663	48.8	(*p* < 0.001)
	Secondary education with Grade 12	396	13.5	167	12.3	
	Tertiary education	98	3.3	19	1.4	
Employment status	Not employed	2332	79.6	959	70.5	53.05
	Self-employed	463	15.8	276	20.3	(*p* < 0.001)
	Employed	135	4.6	125	9.2	
Religion	Christianity	2115	72.2	1148	84.4	90.69
	Traditional	699	23.9	205	15.1	(*p* < 0.001)
	Other	116	4.0	7	0.5	

Tables 2 and 3 show the descriptive statistics of total knowledge, awareness, and attitude scores.

Table 2. Descriptive statistics for community members' knowledge, awareness, and attitudes.

	N	Min–Max	Mean (SD)
TKS	4290	0.00–12.00	5.99 (2.38)
TAS	4290	0.00–3.00	1.39 (1.08)
TATTS	4290	0.00–9.00	4.67 (1.90)

	Province					
	Limpopo			Mpumalanga		
	N	Min–Max	Mean (SD)	N	Min–Max	Mean (SD)
TKS	2930	0.00–12.00	5.84 (2.38)	1360	0.00–12.00	6.32 (2.35)
TAS	2930	0.00–3.00	1.22 (1.07)	1360	0.00–3.00	1.78 (1.03)
TATTS	2930	0.00–9.00	4.70 (1.87)	1360	0.00–9.00	4.61 (1.98)

TKS: Total knowledge score; TAS: Total awareness score; TATTS: Total attitude score. SD: Standard deviation.

Table 3. Community members' knowledge, awareness, and attitude scores were defined.

	Province		
	Limpopo	**Mpumalanga**	
	N (%)	**N (%)**	**χ^2 (*p* Value)**
TKS category			
Low level of knowledge	1712 (58.4)	656 (48.2)	39.037 (*p* < 0.001)
Moderate to high level of knowledge	1218 (41.6)	704 (51.8)	
TATS category			
Unaware	993 (33.9)	207 (15.2)	236.736 (*p* < 0.001)
Somewhat aware	735 (25.1)	269 (19.8)	
Aware	1202 (41.0)	884 (65.0)	
TATTS category			
Negative attitude	1270 (43.3)	598 (44.0)	0.148 (*p* = 0.700)
Positive attitude	1660 (56.7)	762 (56.0)	

The overall mean total knowledge score was 5.9, with a standard deviation of 2.3. In Limpopo, 58.4% exhibited a low level of knowledge, with a mean of 5.84. The maximum score in Limpopo was the same as in Mpumalanga. However, 48.2% of the respondents in Mpumalanga were found to have a low level of knowledge, with a mean of 6.32, which is 0.48 more than Limpopo.

Regarding the total awareness score, both provinces scored an overall mean of 1.39, with an SD = 1.08. However, there was a significant difference between provinces for respondents with an above-average awareness level. In Limpopo, 1.22 was the average score, with the most significant proportion of respondents (41%) reporting being aware of epilepsy, while 25.1% were somewhat aware, and 33.9% fell within the unaware category. In contrast, Mpumalanga had 65% within the aware category, 19.8% were found to be somewhat aware, and 15.2% were unaware of matters relating to epilepsy.

There was no significant difference in the total attitude score (*p* = 0.700), with Limpopo scoring a mean of 4.70 (SD = 1.87) and Mpumalanga 4.61 (SD = 1.98). Many of the respondents scored above average (56.7%) in Limpopo, demonstrating a positive attitude towards epilepsy and PLWE. The level of positive attitude is not significantly different from Mpumalanga, where 56% of respondents were found to have a positive attitude towards epilepsy and PLWE (with a 1.78 mean and SD = 1.03).

According to the findings, most variables measured were found to have a significant correlation with awareness (n = 7) and knowledge (n = 6). Awareness was significantly correlated to knowledge (*p* < 0.01). A summary of the correlation (r) between knowledge, awareness, attitude, and other variables is presented in Table 4. However, both negative and positive significant correlations were found.

A positive correlation was found between awareness of epilepsy and age (r = 0.074), ethnic group (r = 0.122), employment status (r = 0.119), province (r = 0.245), and knowledge (r = 0.201). In contrast, a negative correlation was found between awareness, education level (r = −0.069), and religion (r = −0.103).

Considering the total knowledge predictors as shown in Table 5, this study confirms that all measured variables (age, ethnic group, level of education, employment or work status, and religion) on an adjusted r^2 = 0.013 are significant predictors of an individual's level of knowledge. Although this is the case, the level of education (β = 0.081, t = 4.66; *p* < 0.001) was the strongest predictor.

Table 4. Correlations.

		Awareness	Attitude	Knowledge
Age	r	0.074 **	−0.023	0.043 **
	Sig. (2-tailed)	<0.001	0.134	0.005
Gender	r	0.020	0.018	−0.019
	Sig. (2-tailed)	0.198	0.242	0.221
Ethnic group	r	0.122 **	−0.027	−0.069 **
	Sig. (2-tailed)	<0.001	0.079	<0.001
Level of education	r	−0.069 **	0.040 **	0.041 **
	Sig. (2-tailed)	<0.001	0.009	0.007
Employment status	r	0.119 **	−0.015	0.035 *
	Sig. (2-tailed)	<0.001	0.330	0.021
Religion	r	−0.103 **	−0.010	−0.019
	Sig. (2-tailed)	<0.001	0.524	0.206
Province	r	0.245 **	−0.020	0.094 **
	Sig. (2-tailed)	<0.001	0.186	<0.001
Awareness	r	1	0.025	0.201 **
	Sig. (2-tailed)		0.100	<0.001
Attitude	r	0.025	1	−0.042 **
	Sig. (2-tailed)	0.100		0.006
Knowledge	r	0.201 **	−0.042 **	1
	Sig. (2-tailed)	<0.001	0.006	

* Correlation is significant at the level of 0.005 and ** Correlation is significant at the 0.01 level (2-tailed).

Table 5. Regression analysis for total knowledge score.

Model Summary						
Model	R	R square	Adjusted R square	Std. error of the estimate	F	Sig.
2	0.118 [a]	0.014	0.013	2.36	12.061	<0.001

Coefficients					
Model	Unstandardised coefficients		Standardised coefficients	t	Sig.
	B	Std. error	Beta		
(Constant)	5.484	0.220		24.938	<0.001
Age	0.011	0.002	0.077	4.442	<0.001
Ethnic group	−0.109	0.022	−0.078	−5.023	<0.001
Level of education	0.191	0.041	0.081	4.662	<0.001
Employment or work status	0.137	0.064	0.033	2.142	0.032
Religion	−0.172	0.073	−0.036	−2.365	0.018

[a]. Dependent variable: Total knowledge score.

According to Table 6, all five variables measured were found to be predictors of the overall level of awareness, scoring $p < 0.001$, with an adjusted $r^2 = 0.046$. However, employment or work status was the strongest predictor ($\beta = 0.113$; $t = 7.49$). The total attitude score, as illustrated in Table 7, on an adjusted r^2 of 0.004, ethnic group ($\beta = −0.038$; $t = −2.47$; $p > 0.001$), level of education ($\beta = 0.039$; $t = 2.551$; $p > 0.001$), and religion

($\beta = -0.032$; t = -2.083; $p > 0.001$) showed to have the most vital significance towards predicting the level of attitudes.

Table 6. Regression analysis for total awareness score.

Model Summary						
Model	R	R square	Adjusted R square	Std. error of the estimate	F	Sig.
1	0.215 [a]	0.046	0.045	1.06140	34.569	<0.001
2	0.214 [a]	0.046	0.045	1.06145	41.191	<0.001

Coefficients						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.149	0.099		11.649	<0.001
	Age	0.004	0.001	0.063	3.655	<0.001
	Ethnic group	0.070	0.010	0.110	7.240	<0.001
	Level of education	−0.070	0.018	−0.066	−3.830	<0.001
	Employment or work status	0.215	0.029	0.113	7.490	<0.001
	Religion	−0.0204	0.033	−0.095	−6.241	<0.001

[a]. Dependent Variable: Total awareness score.

Table 7. Regression analysis for total attitude score.

Model Summary						
Model	R	R square	Adjusted R square	SE	F	Sig.
3	0.065 [a]	0.004	0.003	0.49506	4.523	0.001

Coefficients						
Model		Unstandardised coefficients		Standardised coefficients	t	Sig.
		B	Std. error	Beta		
3	(Constant)	1.553	0.038		41.185	<0.001
	Gender	0.030	0.016	0.029	1.911	0.056
	Ethnic group	−0.011	0.005	−0.038	−2.473	0.013
	Level of Education	0.019	0.008	0.039	2.551	0.011
	Religion	−0.032	0.015	−0.032	−2.083	0.037

[a]. Dependent variable: Total attitude score.

4. Discussion

This study had a good and satisfactory response rate which was higher than a study conducted by Saengsuwan et al. [11], which had an 86.9% response rate. This study's exceptionally high response rate may be attributed to the support received from the community's traditional leaders.

The results indicate that, overall, in both provinces, the majority of the respondents have low levels of knowledge, were unaware or somewhat aware, and had a positive attitude towards epilepsy [12]. Although Mpumalanga scored higher than Limpopo on all variables (knowledge, awareness, and attitude), there was no significant difference in attitude. This study demonstrates a correlation between people's level of knowledge and their attitudes and awareness. Furthermore, the data support the hypothesis that certain

demographic variables are associated with the level of people's knowledge, awareness, and attitudes they hold towards epilepsy.

The level of epilepsy knowledge is strongly associated with misconceptions about epilepsy, as Sansa et al. [13] suggested. The overall score indicates that people have sufficient knowledge of epilepsy to claim that they know about epilepsy. The main contributors to this low score may be misconceptions about the cause, treatment/management, first aid, and the origin of epilepsy. This is not uncommon in rural neighbourhoods. As Molla et al. [14] showed in their study, poor knowledge exists in rural Ethiopia, owing to the high levels of misconception about the disease. Although this was also the case in the two South African provinces examined in this study, Mpumalanga scored slightly higher in its total knowledge score (51.8%) than Limpopo (48.2%) with $p < 0.001$. A possible reason is the diversity of cultures within Mpumalanga and, consequently, the probable level of exposure.

However, based on the findings of similar studies, a plausible explanation for the low level of knowledge may be the absence of modern education, age, occupation, and never having witnessed a seizure [3,15,16]. This study may reinforce these studies claiming that there may be an association between one's level of knowledge on epilepsy and age, ethnic group, level of education, employment, and religion.

Contrary to the fact that epilepsy is a common disease, although the percentages are closely aligned, the majority reported that they were unaware or somewhat aware of epilepsy. This was reflected in questions asking whether respondents had ever witnessed an epileptic seizure, whether they knew someone with epilepsy, or whether they had read or heard about epilepsy. Altogether, the provinces scored just above average (53%). On its own, Mpumalanga achieved a somewhat reasonable level of awareness (65%). These findings were vastly different from those of Altowayan et al. [17], who conducted a study in Al Qassim, Saudi Arabia, and reported an above 90% level of awareness about epilepsy. Considering that Al Qassim is the wealthiest area in Saudi Arabia, this supports our claim regarding the correlation between demographics and total scores. Although the study reflects a low adjusted R square, there is a relationship between the independent variables (employment status, ethnic group, level of education, location, and religion) and the dependent variables, which may contribute to an individual's overall level of awareness. This suggests that socio-demographics may have some impact on the total awareness scores of individuals.

According to the study's results, there is no significant difference between the attitude scores for both provinces ($p = 0.700$). However, most respondents reported a positive attitude towards epilepsy, which may be attributed to an individual's knowledge, religion, age, and education, among other factors. This claim is supported by Sansa et al. [13], whose studies on teachers reported a similar correlation.

It is unfortunate that, of the three aspects (knowledge, awareness, and attitude), attitudes strongly influence behaviour, as described by the theories of attitude change [18]. We hypothesise that the predominantly positive attitude positively informed individuals' behaviour towards PLWE, their family members, and caregivers.

5. Conclusions

This study sought to explore the levels of knowledge, awareness, and attitude in rural Limpopo and Mpumalanga. This study found that more people have insufficient knowledge and are unaware of epilepsy but have a positive attitude towards it. In addition, the study revealed a relationship between the three variables of interest with socio-demographic factors, such as religion, level of education, and age. The variables measured are not strong predictors of the overall scores attained per province. However, the total knowledge and awareness scores point to a need for intentional epilepsy education, as failure to do so may negatively impact the quality of life of PLWE and their families. It is recommended that future research explore whether contextualised epilepsy education can

increase attitudes, awareness, and behaviours towards epilepsy. In addition, future studies should examine the correlation between attitudes and behaviours towards PLWE.

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