Seizure 21 (2012) 12–16

Contents lists available at SciVerse ScienceDirect

Seizure

journal homepage: www.elsevier.com/locate/yseiz

Social and family characteristics of Hispanics with epilepsy

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ARTICLE INFO

Article history:
Received 8 May 2011
Received in revised form 12 August 2011
Accepted 16 August 2011

Keywords:
Epilepsy
Family relationship
Quality of life
Hispanic
Acculturation

ABSTRACT

The purpose of this study is to determine how acculturation, social support, family emotional involvement, perceived family criticism and stigma are associated with epilepsy self-efficacy and depression. A principal components analysis (PCA) was used to describe the salience of these characteristics within a sample of Hispanics with epilepsy.

A total of 50 Hispanic adults of Mexican descent identified in our Epilepsy Clinic participated in this study. The PCA identified four distinct types, two were relatively culture-free, and two were distinctly culturally oriented. The first non-culture affiliated type described a well-adjusted group of individuals that tended to be males with moderate self-efficacy, who received social support, and who were unlikely to have depression or feel stigmatized. The second non-culture affiliated type described a dimension in which family emotional involvement tended to co-occur with perceived criticism. The Anglo-oriented group had a family environment that did not appear to criticize the individual with epilepsy and had good self-efficacy. The Mexican-oriented group had high self-efficacy and was unlikely to have depression. Results suggest that acculturation variables must be taken into consideration among ethnic groups because social, psychological and acculturation variables interact in complex ways. Additionally, it is clear that a diagnosis of epilepsy does not automatically lead to poor quality of life, stigma, or depression.

1. Introduction

Epilepsy directly impacts the quality of life of the afflicted individual physically, socially, and psychologically, and indirectly by introducing limitations and restricting opportunities to engage in many activities.[1] It is associated with mood disorders, low self-esteem, perceived stigma, and stress[2] that can be more problematic and handicapping than the seizures themselves.[3,4] Individuals with epilepsy who are stigmatized feel devalued by society[5] and report poor self-efficacy (perception of one's ability to accomplish a particular task), low satisfaction with care, low medication adherence, and negative outcome expectancies related to the disorder.[6] Such negative outcomes may be mitigated if there is a supportive network for the person with epilepsy since the support provided is associated with a better health-related quality of life.[7] However, support resulting in over-protection, a tendency expressed by Hispanics, may be problematic. The purpose of this study is to determine how acculturation, social support, family emotional involvement, perceived family criticism and stigma are associated with epilepsy self-efficacy and depression among Hispanics with epilepsy.

Family orientation is a strong Hispanic value and family support is positively related to health.[8] However, when confronted with epilepsy, this family support may be problematic since there appears to be a tendency to overprotect the family member with epilepsy, with the family holding views that such a person needs total supervision, and should be hidden.[9,10] Such negative stereotyping stigmatizes epilepsy and may lead to over-reactions and over-involvement by the family, potentially leaving the patient feeling restricted and singled out,[11–13] which in turn can lead to poor self-management[14] and poor long term outcome.[15] This has been shown in children with epilepsy who tend to exhibit high levels of behavioral problems if their parents consider epilepsy to be stigmatizing and were emotionally over-involved.[16]

A high degree of expressed emotion (EE) in the family is indicated through emotional over-involvement or when family members express hostility, criticize, or respond negatively toward the individual with epilepsy.[17] In a high EE environment, patients were more likely to report depressive symptoms[18] and show low adherence to treatment.[19,20] In general, Hispanic families show less EE than Caucasian families toward the family member with a stigmatized condition.[21] However such interactions may be affected by acculturation levels[22] and with cultural conflict within the family, health can be affected.[8]

The relationship between emotional involvement and perceived criticism also appears to depend on acculturation. Among

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doi:10.1016/j.seizure.2011.08.008

immigrant groups, emotional over-involvement does not co-occur with perceived criticism.[23] Immigrant mothers from Mexico use positive feedback and have less stressful interactions with their child with epilepsy than US born Mexican American mothers.[24] This suggests that patients and family members who are more Anglo acculturated may be more likely to have negative interactions. This also suggests that if acculturation is not taken into consideration, inconsistent findings will appear in the literature,[25,26] or results will be incorrectly interpreted.[27] With a paucity of information on the impact of EE on Hispanics with epilepsy, it is necessary to be cautious when attempting to draw cross-ethnic comparisons or conclusions since what may be considered over-involvement in an Anglo family could be considered normal in a Mexican American family.

In summary, research on the psychosocial aspects of epilepsy suggests that Hispanic individuals with epilepsy may have negative outcomes if their families think that they should be hidden because they view epilepsy as a stigma. Such stigma in turn may affect self-management of epilepsy and lead to negative mood outcomes. However, this may only occur among Hispanics that are Anglo-oriented if those who are more Mexican-oriented do not feel stigmatized by the emotional over-involvement. Since acculturation factors can influence family interactions, the relationships between epilepsy self-efficacy, depression, perceived stigma, and the individual's social/family environment need to be assessed for Hispanics as a function of acculturation. If acculturation has a differential influence, providers working with Hispanic patients need to consider the acculturation level of the patients in addition to their ethnicity.

To describe the relationships between the variables of interest, a principal components analysis (PCA) will be conducted. This technique analyzes the available data into different components,[28] with each component's salient characteristics described by the loadings or correlations of the variables toward that component. In other words, the PCA was used to show the characteristics that different individuals have by the way the variables loaded on the component. From the literature review, we expect the characteristics to depend on the acculturation level of the individual. As noted earlier, those who are more Anglo-oriented may be more likely to experience negative familial interactions such as perceived criticism. Among these individuals, they would be more likely to report perceived stigma, be more depressed, and be less able to self-manage epilepsy.

2. Methods

Adult Hispanic patients were recruited from the Comprehensive Epilepsy Clinic of The University of Arizona between February 2008 and July 2009. Recruited individuals were asked to complete a set of six questionnaires to measure stigma, social support, family environment, self-efficacy, depression and acculturation. All surveys were completed in English. Patients took the questionnaires home from their appointments to be completed at their leisure. Over 74% of the individuals returned the completed questionnaires and each were paid $20.00.

The Epilepsy Self-Efficacy Scale[29] was used to assess the person's epilepsy self-efficacy, that is, his or her perception of whether or not she/he is able to carry out tasks associated with epilepsy self-management. The tasks assessed included management of medication, seizures, and of general health issues (including safety, health, stress, exercise, and diet). Cronbach's alpha for the scale was 0.96.[6]

Perceived stigma was measured using an edited version of the Parent Stigma Scale.[6] It contains statements that portray the perception of the individual with epilepsy as negative. The alpha coefficient for this modified scale was reported to be 0.91.

Social support was measured using the Interpersonal Support Evaluation List (ISEL).[31] This scale is made up of four subscales: appraisal (having someone to talk to about one's problems), belonging (having people with whom one can do things), tangible support (material aid) and self-esteem (having a positive self-image in relation to others). The ISEL shows good test–retest reliability over a four week period, with an alpha coefficient near 0.9.[29]

The Family Emotional Involvement and Criticism Scale (FEICS)[19,31] was used to assess the two components of expressed emotion: family emotional involvement and perceived family criticism, each measured by 7 items. Reliability (Cronbach's Alpha) for both subscales was 0.74 and 0.82 respectively.

To measure depression, the Patient Health Questionnaire 9 (PHQ-9)[32] was used. This instrument has been shown to be a reliable and valid measure of depression severity. It has also been used with the Spanish speaking population and found to be comparable to the English version.[33]

Finally, acculturation was measured using the Acculturation Rating Scale for Mexican Americans II (ARSMA-II).[34] The ARSMA-II uses two subscales, one to measure the Mexican Orientation Score (MOS), and a second, orientation toward the Anglo culture (AOS).

The variables used in the PCA were epilepsy self-efficacy, stigma, social support, family emotional involvement, perceived family criticism, depression, and the Anglo-oriented and Mexican-oriented scales. The extracted components were rotated by a varimax rotation which maximizes the variance and improves interpretability of the components.[28] By reducing the inter-related variables into components, this procedure can be used to explore how the psychosocial variables are related by assessing the strength of the correlation between the variables and the component (or dimension). The scores of each individual for each of the dimensions are calculated using least squares regression.[35] The individual's score provides an indication of where he or she is on that dimension; the higher the score, the better the dimension describes that individual. The demographic characteristics associated with the resulting dimensions will be described and compared using one way Analyses of Variance and Bonferroni post hoc tests. This study was approved by the Institutional Review Board of The University of Arizona.

3. Results

A total of 70 Hispanic adults were recruited, and 52 individuals (14 males and 38 females) returned the surveys. All but two identified themselves as of Mexican descent (Mexican, Mexican American, or Chicano); these two individuals were not included in the analyses. Table 1 shows the sociodemographic characteristics of the survey respondents.

Almost two-thirds of the patients were less than 45 years of age, were single, and not living with a partner. Almost half had some college education; slightly more than a third reported that they were employed. A large proportion reported that their household income came from the employment of a family member; a slightly larger group reported receiving government welfare, and a large minority reported receiving social security income. One third of the individuals came to the United States from Mexico, with similar numbers showing preferred orientation toward the Anglo or Mexican culture. Female patients had significantly higher depression scores than male patients (average depression score of 9 vs 4; $t(1, 48) = 2.9$, $p < 0.01$). No other differences were found between male and female patients.

Social support showed significant negative correlations with stigma and depression (Table 2) and was significantly correlated positively with self-efficacy. Depression was positively correlated with stigma and negatively with self-efficacy. Being Anglo-oriented

Table 1
Patient characteristics.

		Frequency	Percent	$\bar{x}$ (sd)
Sex	Male	14	28.0	
	Female	36	72.0	
Age range	18–24 years	7	14.0	38.6 yrs
	25–44 years	25	50.0	(13.6)
	45–64 years	16	32.0	
	65 years and older	2	4.0	
Marital status	Married or living together	19	38.0	
	Formerly married	11	22.0	
	Never married/single	20	40.0	
Education	Some high school or less	6	12.0	
	High school diploma	12	24.0	
	Some college or college graduate	23	46.0	
	Some vocational training or trade school diploma	8	16.0	
	Missing	1	2.0	
Employment	Employed	18	36.0	
	Homemaker, Student (not working)	9	18.0	
	Not working	23	46.0	
Chronic illness	(not including epilepsy)			0.6 (0.7)
	None	24	48.0	
	One	21	42.0	
	More than one	5	10.0	
Income	Under $15,000	14	28.0	
	$15,000–49,999	23	46.0	
	$50,000 and over	10	20.0	
	Missing	3	6.0	
Income sources	Employment/own business	29	58.0	
	Government welfare programs[a]	31	62.0	
	Social Security Income	20	40.0	
Have you always lived in the United States?				
	No	17	34.0	
	Yes	33	66.0	

[a] Supplemental Security Income, Aid to Families with Dependent Children, Women, Infants & Children program, other welfare programs.

was significantly correlated with self-efficacy. Perceived family criticism and family emotional involvement were not correlated with each other or with the other variables. The mean scores for the "positive" measures (e.g., self-efficacy, social support) were over the midpoints, and lower than the midpoints for the "negative" constructs (e.g., perceived criticism, depression) except for stigma, in which the mean score was slightly above the midpoint of the scale. The observed minimum and maximum scores show that no one reported excessive emotional involvement or perceived criticism. The average Anglo orientation score was minimally higher than the average Mexican orientation score; distribution of the Anglo orientation scores was normal with a mode of 4.1 whereas Mexican orientation was bimodal, peaking at 2.3 and 4.1.

The rotated PCA yielded four dimensions which explained 77.9% of the variance (Table 3). The loadings shown in the matrix describe the strength of the correlation between the variables and the specific dimension. Variables with loadings greater than 0.2 were used to interpret the dimensions.

Individuals with high scores on the first dimension have strong social support, significant negative correlations with depression and perceived stigma, and a moderate correlation with self-efficacy. They were more likely to be males ($F(1,47) = 4.3, p < 0.05$). This group will be referred to as "well-adjusted". The remaining three dimensions each accounted between 15% and 19% of the variance. For the second dimension, individuals with high scores were oriented toward the Anglo but not Mexican culture and were more likely to be individuals who have always lived in the United States ($F(1, 47) = 14.6, p < 001$). This group (referred to as the Anglo-oriented group) tended to have good epilepsy self-efficacy, higher education – beyond high school ($F(2, 45)$ 8.4, $p < 0.001$), and a trend toward higher income ($F(2, 43) = 3.2, p = 0.05$) – the individual levels did not differ significantly from each other. They have emotionally involved family members but who were not negative or critical of the family member with epilepsy. Individuals with high scores in the third dimension were strongly oriented toward the Mexican culture, had high self-efficacy and tended not

Table 2
Means and correlations of dependent variables.

	Social support	Stigma	Depression	Perceived criticism	Emotional involvement	Self-efficacy	Anglo oriented	Mexican oriented
Possible range	0–1	1–7	0–27	1–7	1–7	0–10	1–5	1–5
$\bar{x}$ (sd)	0.7 (0.2)	3.8 (1.8)	7.6 (7.7)	2.5 (0.6)	3.0 (0.6)	8 (1.4)	3.6 (0.8)	3.4 (0.9)
Social support	–	−.65***	−.63***	−.21	.12	.29*	.27	−.12
Stigma		–	.39**	.26	.04	−.20	−.25	.10
Depression			–	−.01	−.05	−.42**	−.08	−.29
Perceived criticism				–	.23	−.19	−.27	.05
Emotional involvement					–	.08	.17	−.22
Self-efficacy						–	.30*	.21
Anglo oriented							–	−.28

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 3
Construct loadings from a principal components analysis.

	Groups			
	1	2	3	4
Anglo Orientation Scale	0.12	0.86	−0.05	0.10
Mexican Orientation Scale	−0.11	−0.33	0.77	−0.22
Self-efficacy	0.28	0.47	0.73	0.11
Family environment				
Emotional involvement	0.06	0.23	−0.11	0.84
Perceived criticism	−0.14	−0.56	0.03	0.67
Social support	0.90	0.17	−0.01	0.02
Depression	−0.80	0.06	−0.32	−0.16
Stigma	−0.80	−0.18	0.13	0.16
Variance explained	27.5%	18.8%	15.8%	15.8%

to be depressed (referred to as the Mexican-oriented group). They were more likely to be individuals who have not lived in the United States all their lives ($F(1, 47, = 8.7, p < 0.01)$), and have an annual household income less than $50,000 ($F(2, 43) = 4.6, p < 0.05$). Those who had high scores for the fourth dimension have family members who were emotionally involved and critical of the family member with epilepsy. This group, referred to as the criticized group, was slightly less likely to be Mexican-oriented. Individuals with a high score in this dimension were not distinguished by any demographic characteristics that were measured. No differences were found in terms of marital or employment status for any of the four dimensions.

4. Discussion

Findings from this study support previous research findings and add to the body of literature regarding the psychosocial factors influencing the lives of Hispanic individuals with epilepsy. Our study shows that the relationships between self-efficacy, stigma, depression and emotional over-involvement are not always straightforward and need to take into account the individual's cultural orientation.

Previous research indicated that epilepsy self-efficacy was negatively related to outcomes such as depression[36] and to a lesser extent, stigma.[6] Results from a survey with Hispanics on epilepsy suggested a substantial need for epilepsy education, with 53% stating that their family was likely to hide epilepsy, and 68% agreeing that the family member with epilepsy needs total supervision.[7] These findings led us to expect Hispanics to be over-protective and overinvolved with the family member with epilepsy, leading to poor self-efficacy, perceived stigma, and increased depression for that individual, although we cautioned that acculturation may influence these relationships. Our results showed no support for the hypothesis. In the overall results, neither perceived criticism nor emotional involvement was correlated with any of the measures. The PCA results suggested that being Anglo-oriented was associated with family emotional involvement, but association with perceived family criticism was negative. For the "criticized group" where emotional involvement and perceived criticism were associated together, there was no relationship with culture.

In general, the PCA identified four categories that Hispanic individuals with epilepsy may fall into depending on their acculturation level and interactions with their friends and family. The well-adjusted group and the criticized group were relatively "acculturation-free" as compared to the "Anglo-oriented" and "Mexican-oriented" groups which have demographic characteristics consistent with immigrant status. It is clear that the relationships between the psychosocial variables are complex and can depend on the individual's cultural orientation. What appears to be independent of culture is the negative association between social support, depression and perceived stigma. The relationships between self-efficacy and social support, depression, perceived family criticism, perceived stigma, and family emotional involvement are inconsistent across the groups, suggesting that other variables may have a stronger relationship with self-efficacy.[6,30] The overall correlation between self-efficacy and social support was significant but not robust, although the negative correlation was more robust between self-efficacy and depression.

Prior studies have demonstrated that neither family cohesion nor adaptability among Mexican Americans was influenced by acculturation, and indeed such characteristics were similar with Anglos, even as familial obligations change.[37,22] Our results also found that strongly Anglo-oriented or Mexican-oriented Hispanics were unlikely to report perceiving familial criticism, even with emotionally involved family members. This finding supports previous reports that emotional over involvement and perceived criticism do not necessarily co-occur, and that Anglo acculturated Hispanics show less criticism and hostility than high EE Anglos.[23] However, this should be examined further since other literature comparing immigrant with US born Mexican Americans showed differences in family interactions.[24] In the absence of an orientation toward the Anglo or Mexican culture, emotional involvement becomes strongly associated with perceived criticism, suggesting emotional over-involvement.

The Mexican-oriented dimension describes characteristics that are consistent with immigrants from Mexico. Those who scored high on this dimension did not show an orientation toward the Anglo culture, and had lived outside of the US. They would be expected to have a smaller social network than later generations[38]; one possible reason why social support did not load strongly on this dimension may be that geographic and logistical barriers reduced the ability of the individual's social network to provide the kinds of support measured, and not because of an absence of a close relationship. Other studies have found that even with low social support, foreign-born, Mexican Americans tend to have better health[39] compared to US-born Mexican Americans. Immigrants may be a group that has to be self-reliant in order to survive.

Future research should expand upon the present findings to determine what factors are associated with epilepsy self-efficacy among patients with different cultural orientation. The "resilience" of the immigrant group should be further studied to determine why they appear to be free of depression, have high self-efficacy, and seemingly unaffected by whether or not social support was available. While this may be consistent with the immigrant effect, a phenomenon showing that immigrants tend to have better health than native born Hispanics,[40] these are nevertheless individuals who do have epilepsy, a chronic illness. Since the subjects were also all living near the Mexican border, their acculturation characteristics may be very different from those of individuals living in communities that are less immersed in the Mexican culture.

The patients in this study may only be representative of a small subset of Mexican Americans with epilepsy since these patients were all recruited from a specialty clinic. In general, Hispanics tend to receive their epilepsy care through generalists rather than specialists.[41] Further, there were far more women represented in this sample than men so we cannot exclude gender differences. This group of subjects may also differ from other samples since they tend to be more positive in their outlook. Since our previous research found a substantial minority of individuals with epilepsy that had not sought epilepsy care (and was not previously diagnosed with epilepsy),[42] this suggests that there may be a strong sense of stigma that is not being tapped in this study. Other limitations of this study include the use of the PCA on a relatively small number of subjects and the number of analyses using the

same data. A larger study with subjects from both specialist and primary care provider clinics would improve the generalizability of the study, and allow further analysis of differences across acculturation levels. A confirmatory factor analysis should also be used to test the reliability of the four dimensions found.

5. Conclusion

In summary, results of this study suggest that for groups of individuals whose acculturation levels vary widely such as is found among Hispanics living along the border, acculturation must be taken into account for a more complete and accurate interpretation of data. However, it is also clear that the results here show just how complicated the relationships between social support, acculturation, nativity (whether the individual lived in the United States all his or her life), and stigma can interact to affect depression and self-efficacy. The findings of this study suggest that a diagnosis of epilepsy does not condemn the individual to a life of stigma, depression, and poor quality of life.

Disclosure

The authors have nothing to disclose.

Study funding

Funding for this project was provided in part by the National EpiFellows Foundation to Paul Atkinson, M.D., and by the Department of Neurology at the University of Arizona.

Contributions

The authors thank the University Physicians Hospital for granting the use of its facility for recruitment and for all the patients who agreed to participate in the project. We also thank Seenaiah Byreddy, MBBS, for his assistance in the preparation of the document.

References

1. Bishop M, Allen CA. The impact of epilepsy on quality of life: a qualitative analysis. *Epilepsy & Behavior* 2003;**4**:226–33.
2. De Souza EAP, Salgado PCB. A psychosocial view of anxiety and depression in epilepsy. *Epilepsy & Behavior* 2006;**8**:232–8.
3. Mirnics Z, Békés J, Rózsa S, Halász P. Adjustment and coping in epilepsy. *Seizure* 2001;**10**:181–7.
4. Fisher RS, Vickrey BG, Gibson P, Hermann B, Penovich P, Schrer A, et al. The impact of epilepsy from the patent's perspective. I. Descriptions and subjective perceptions. *Epilepsy Research* 2000;**41**:39–51.
5. McLin WM, de Boer HM. Public perceptions about epilepsy. *Epilepsia* 1995;**36**(10): 957–9.
6. DiIorio C, Shafer PO, Letz R, Henry T, Schomer DL, Yeager K, et al. The association of stigma with self-management and perceptions of health care among adults with epilepsy. *Epilepsy & Behavior* 2003;**4**:259–67.
7. Charyton C, Elliott JO, Moore JL. The impact of social support on health related quality of life in persons with epilepsy. *Epilepsy & Behavior* 2009;**16**:640–5.
8. Mulvaney-Day NE, Alegria M, Scribney W. Social cohesion, social support, and health among Latinos in the United States. *Social Science & Medicine* 2007;**64**: 477–95.
9. Sirven JI, Lopez RA, Vazquez B, Haverbeke PV. Quées la epilepsia? Attitudes and knowledge of epilepsy by Spanish-speaking adults in the United States. *Epilepsy & Behavior* 2005;**7**:259–65.
10. DiIorio CA, Kobau R, Holden EW, Berkowitz JM, Kamin SL, Antonak RF, et al. Developing a measure to assess attitudes toward epilepsy in the US population. *Epilepsy & Behavior* 2004;**5**:965–75.
11. Maclean HM. Patterns of diet related self-care in diabetes. *Social Science & Medicine* 1996;**32**(6):689–96.
12. Gallant MP. The influence of social support on chronic illness self-management: a review and directions for research. *Health Education & Behavior* 2003;**30**: 170–95.
13. Maillet NA, D'EramoMelkus G, Spollett G. Using focus groups to characterize the health beliefs and practices of Black women with non-insulin-dependent diabetes. *Diabetes Educator* 1996;**22**(1):39–46.
14. Dilorio C, Hennesy M, Manteuffel B. Epilepsy self-management: a test of a theoretical model. *Nursing Research* 1996;**45**(4):211–7.
15. Thompson SC, Sobolew-Shubin A. Overprotective relationships: a nonsupportive side of social networks. *Basic and Applied Social Psychology* 1993;**14**(3): 363–83.
16. Carlton-Ford S, Miller R, Nealeigh N, Sanchez N. The effects of perceived stigma and psychological over-control on the behavioural problems of children with epilepsy. *Seizure* 2007;**6**:383–91.
17. Stanhope N, Goldstein LH, Kuipers E. Expressed emotion in the relatives of people with epileptic or nonepileptic seizures. *Epilepsia* 2003;**44**(8):1094–102.
18. Franks P, Campbell TL, Shields CG. Social relationships and health: the relative roles of family functioning and social support. *Social Science and Medicine* 1992;**34**(7):779–88.
19. DiMateo MR. Social support and patient adherence to medical treatment. *Health Psychology* 2004;**23**(2):207–18.
20. Otero S, Hodes M. Maternal expressed emotion and treatment compliance of children with epilepsy. *Developmental Medicine & Child Neurology* 2000;**42**: 604–8.
21. Kopelowizc A, Zarate R, Gonzalez V, López SR, Ortega P, Obregon N, et al. *Evaluation of expressed emotion in schizophrenia a comparison of Caucasians and Mexican Americans* 2002;**55**:186–279.
22. Sabogal F, Marin G, Otero-Sabogal R, Marin BV, Perez-Stable EJ. Hispanic familism and acculturation: what changes and what doesn't? *Hispanic Journal of Behavioral Sciences* 1987;**9**(4):397–412.
23. López SR, Garcia JIR, Ullman JB, Kopelwicz A, Jenjins J, Breitborde NJK, et al. Cultural variability in the manifestation of expressed emotion. *Family Process* 2009;**48**(2):179–94.
24. Chavez JM, Buriel R. Mother–child interactions involving a child with epilepsy: a comparison of immigrant and native-born Mexican Americans. *Journal of Pediatric Psychology* 1988;**13**(3):349–61.
25. Torres L, Rollock D. Acculturation and depression among Hispanics: the moderating effect of intercultural competence. *Cultural Diversity and Ethnic Minority Psychology* 2007;**13**(1):10–7.
26. Antecol H, Bedard K. Unhealthy assimilation: why do immigrants converge to American health status levels? *Demography* 2006;**43**(2):337–60.
27. Halgunseth LC, Ispa JM, Rudy D. Parental control in Latino families: an integrated review of the literature. *Child Development* 2006;**77**(5):1282–97.
28. Everitt BS, Dunn G. *Applied multivariate data analysis*. London, UK: Edward Arnold; 1991.
29. Dilorio C, Faherty B, Manteuffel B. Self-efficacy and social support in self-management of epilepsy. *Western Journal of Nursing Research* 1992;**14**: 292–307.
30. Cohen S, Mermelstein R, Kamarck T, Hoberman H. Measuring the functional components of social support. In: Sarason IG, Sarason BR, editors. *Social support: theory, research and application*. The Hague: Martinus Nijhoff; 1985.
31. Shields CG, Franks P, Harp JJ, McDaniel SH, Campbell TL. Development of the Family Emotional Involvement and Criticism Scale (FEICS): a self-report scale to measure expressed emotion. *Journal of Marital and Family Therapy* 1992;**18**(4): 395–407.
32. Kroenke K, Spitzer RL, Williams JBL. The PHQ-9. Validity of a brief depression severity measure. *Journal of General Internal Medicine* 2001;**16**:606–13.
33. Diez-Quevedo C, Rangil T, Sanchez-Planell L, Kroenke K, Spitzer RL. Validation and utility of the Patient Health Questionnaire in diagnosing mental disorders in 1003 general hospital Spanish inpatients. *Psychosomatic Medicine* 2010;**63**: 679–86.
34. Cuéllar I, Arnold B, Maldonado R. Acculturation rating scale for Mexican Americans-II: a revision of the original ARSMA Scale. *Hispanic Journal of Behavioral Sciences* 1995;**17**(3):275–302.
35. DiStefano C, Zhu M, Mindrilă D. Understanding and using factor scores: considerations for the applied researcher. *Practical Assessment Research & Evaluation* 2009;**14**(20):1–11.
36. Reisinger E, Dilorio C. Individual, seizure-related, and psychosocial predictors of depressive symptoms among people with epilepsy over six months. *Epilepsy & Behavior* 2009;**15**:196–201.
37. Vega WA, Patterson T, Sallis J, Nader P, Atkins C, Abramson I. Cohesion and adaptability in Mexican-American and Anlo families. *Journal of Marriage and Family* 1986;**48**(4):857–67.
38. Griffith J. Emotional support providers and psychological distress among Anglo- and Mexican Americans. *Community Mental Health Journal* 1984;**20**(3): 182–201.
39. Franzini L, Fernandez-Esquer ME. Socioeconomic, cultural, and personal influences on health outcomes in low-income Mexican-origin individuals in Texas. *Social Science & Medicine* 2004;**59**:1629–46.
40. Jasso G, Massey DS, Rosenzweig MR, Smith JP. *Immigrant health: selectivity and acculturation*. RAND: The Institute for Fiscal Study; 2004 Available from *http://econwpa.wustl.edu/eps/lab/papers/0412/0412002.pdf*.
41. Begley CE, Base R, Reynolds T, Lairson DR, Dubinsky S, Newmark M, et al. *Epilepsia* 2009;**50**(5):1040–50.
42. Chong J, Labiner DM. Prevalence of epilepsy along the Arizona-Mexico border. *Poster presented at the 62nd annual meeting of the American Epilepsy Society*. 2008.