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Long-term outcome in a sample of underprivileged patients with psychogenic nonepileptic seizures (PNES) living in Argentina

Guido Pablo Korman [a,*], Mercedes Sarudiansky [a], Alejandra Inés Lanzillotti [a], María Marta Areco Pico [a], Cristina Tenreyro [b], Gabriela Valdez Paolasini [b], Luciana D'Alessio [c], Laura Scevola [d], Silvia Kochen [c], Lorna Myers [e]

[a] CAEA, CONICET, Facultad de Psicología, Universidad de Buenos Aires, Argentina
[b] Facultad de Psicología, Universidad de Buenos Aires, Argentina
[c] ENyS, CONICET, Buenos Aires, Argentina
[d] Mental Health Center, Ramos Mejía Hospital, Buenos Aires, Argentina
[e] Northeast Regional Epilepsy Group, United States of America

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ABSTRACT

Objective: The objective of the present study was to perform a long-term follow-up of economically disadvantaged Latin American patients diagnosed as having psychogenic nonepileptic seizures (PNES) and contribute to the field's understanding of outcome in this population.
Background: A handful of studies have examined outcome of patients once the diagnosis of PNES has been communicated. However, the vast majority of these have been conducted in the first world countries with samples that were predominantly Caucasian. There is limited knowledge about outcome in economically disadvantaged Latin American patients diagnosed as having PNES.
Methods: This is a study of 23 patients (20 women, 3 men) with PNES in which demographic data (age, education, nationality, presence of psychological trauma, age of onset) were retrospectively retrieved from medical files. Follow-up was done through a telephonic questionnaire in which investigators collected clinical information (seizure characteristics at follow-up, and treatments employed) and changes in demographic data.
Results: Patients from this Argentinian PNES sample demonstrated having many similar demographic and clinical characteristics to samples from US and European studies. Long-term follow-up revealed, however, decreased seizure frequency and intensity as well as a substantial improvement in occupational status. A majority had engaged in psychotherapy as well as alternative and complementary approaches. A majority had also developed what are suspected to be other functional symptoms.
Conclusions: Argentinian patients from economically disadvantaged backgrounds, diagnosed as having PNES reported improvements in seizure frequency and occupational status during long-term follow-up. Future studies will need to focus on what (e.g., communication of diagnosis, psychotherapy, alternative treatments) may have contributed to these changes.

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1. Introduction

Psychogenic nonepileptic seizures (PNES) are paroxysmal events that resemble epileptic seizures in presentation but lack electrophysiological correlates or clinical evidence for epilepsy. Instead, there is evidence of psychological antecedents, and, as such, PNES are categorized as functional neurological disorders (FND)/conversion disorders within the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*) [1].

The majority of studies that have examined prognosis and long-term outcome in PNES have focused on seizure frequency and seizure freedom while some have also assessed quality of life variables, healthcare utilization, and economic data such as occupational status [2–5]. Results of most follow-up studies have found that seizure freedom is not attained in a large percentage of patients and gainful employment remains elusive for many, although on a positive, reduced healthcare utilization is more commonly observed after the proper diagnosis has been provided [6]. One study also examined rates of newly developed somatic complaints and reported that up to 25% developed these after diagnosis [7]. Additional factors that are believed to contribute to better outcomes include the following: higher educational achievements, younger onset and diagnosis, less dramatic seizures, and less severe comorbid psychopathology [3].

* Corresponding author at: Centro Argentino de Etnología Americana, Consejo Nacional de Investigaciones Científicas y Técnicas, Avenida de Mayo 1437 – 1A, Buenos Aires, Argentina.
E-mail address: guidokorman@conicet.gov.ar (G.P. Korman).

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There have been few long-term outcome studies in countries other than in Europe or the US. A recent exception is from Iran [8] in which postdiagnosis seizure frequency and delivery of psychotherapeutic treatment were verified; half of the patients had achieved seizure freedom while a very important percentage had not received appropriate psychological treatment. Another study from the Middle East (Israel) [9] that included 51 patients compared long-term outcome in patients with PNES alone with those with PNES plus epilepsy, and follow-up revealed that only 22% of those with PNES alone achieved seizure freedom.

The objective of the present study was to perform a long-term follow-up of economically disadvantaged Argentinian patients diagnosed as having PNES and contribute to the field's understanding of patient outcome in this setting. We expected that the patients' lower socioeconomic status (SES) might result in greater difficulty finding appropriate treatment, greater use of folk medicine, and other adverse experiences compounded by lack of resources. As a result, we hypothesized that outcome on several variables would be comparable or worse to European and US studies.

2. Methods

This is a study of 23 patients (20 women, 3 men) with PNES (2009 to 2017) in which data were retrospectively retrieved from medical files and followed up by a telephonic questionnaire administered by an investigator to assess outcome.

The Ramos Mejía Hospital Epilepsy Center (RMHEC) is a major public referral center for the evaluation and treatment of epilepsy in Buenos Aires City, Argentina. As a tertiary referral epilepsy center, it serves a population drawn from other parts of the country, with high rates (70–80%) of drug-resistant epilepsy (DRE) [10]. Patients tend to be from lower socioeconomic sectors [11,12].

All the patients included in this study underwent video-electroencephalography (V-EEG) evaluations to confirm the DRE/PNES diagnosis and to determine their candidacy for epilepsy surgery.

Psychiatric assessment was performed during a five-day video-EEG monitoring stay in the hospital by psychiatrists who were blind to the seizure diagnosis. Psychiatric history was obtained from each patient, complemented by information from relatives. Trauma history was obtained during the first interview.

Once the diagnostic protocol was completed, all patients with PNES participated in a psychoeducational session with psychologists or psychiatrists who specialize in PNES. All patients who were identified to have a psychiatric disorder were referred for psychiatric treatment and psychotherapy.

Subsequent follow-up included all adult patients (age > 18) with confirmed diagnosis of PNES found in the electronic database chart of the Ramos Mejía Hospital Video-Electroencephalography Monitoring Unit. The initial number of 47 patients in the dataset was reduced to 23 because phone numbers listed in the chart had been disconnected, or repeated attempts to call a listed number resulted in no answer. Additionally, one patient who was contacted refused to participate in the interview.

Demographic (age, education, nationality, and place of residence) and clinical (age of PNES onset, risk factors) information were collected through chart review. Patients were later contacted via phone by an investigator (GK, MAP, GV, CT) and verbally administered a questionnaire. All items from the questionnaire can be found in Table 4.

This study is descriptive in nature and as such will be presented in narrative form without statistical analyses.

The ethics committees of the Ramos Mejía Hospital approved this investigation. All of the patients signed informed consents.

3. Results

A total of 47 consecutive patients from 2009 to 2017 had a confirmed diagnosis of PNES through V-EEG and fulfilled all other inclusion criteria. Thirty-eight (80.9%) were women, and 9 (19.1%) were men. The subjects' ages ranged from 20 to 54 years (mean [M] = 31.2; standard deviation [SD] = 10.5).

Twenty-four patients were contacted at the time of follow-up between October and November 2018; one of these did not agree to participate. Twenty (87%) out of 23 were women, and the ages of respondents ranged from 21 to 58 years (M = 34.1; SD = 10.5). Five (22%) of these patients were diagnosed as having both PNES and epilepsy. With regard to nationality, at the time of the hospital admission, the majority were Argentinian nationals, followed by Paraguayans and then Bolivia and Peru. The distribution of nationalities was similar at follow-up (Table 1).

As for their place of residence, at the time of the hospital admission, most respondents reported being residents of the Metropolitan Area of Buenos Aires, followed by the city of Buenos Aires, and other provinces. A much smaller number had traveled from the Buenos Aires Province, and only one respondent had traveled from another country. At follow-up, the distribution of place of residence remained generally unchanged (Table 1).

With regard to highest level of education, at the time of the hospital admission, nearly a quarter had either incomplete or complete elementary (23.4%), roughly 50% had either incomplete or complete high school, slightly less than 13% had either incomplete or complete trade school studies, and roughly 10% had incomplete university studies. At the time of follow-up, the distribution of academic completion remained relatively unchanged with around 60% having completed high school, trade school, or reporting some college education (Table 1).

As for marital status, at the time of diagnosis, the majority of patients reported being single or not in a relationship, while slightly over 30% were married/in a relationship. Only 6.4% were divorced or separated. At follow-up, there were some changes noted in seven cases, with 4 individuals having entered into a relationship and 2 who had divorced since they had been diagnosed as having PNES (Table 2).

The occupational status of patients revealed at the time of diagnosis that over three-fourths were unemployed while less than 20% were working and less than 9% were full-time students (Table 2). At follow-up, a notable change was observed in rates of unemployment with nearly 40% engaged in work and a decline in the percentage of patients who were unemployed.

Age of seizure onset in the sample ranged from infancy to 53 years of age (M = 18.3; SD = 12). Time elapsed from first seizure until V-EEG testing and diagnosis ranged from a few months to 46 years (M = 11.8; SD = 12.3). Over half of the sample had experienced PNES

Table 1
Demographic data: nationality, place of residence, and education.

	Patients at epilepsy monitoring unit N = 47 (%)	Patients contacted for follow-up n = 23 (%)
Nationality		
Argentina	40 (85.1)	20 (87)
Paraguay	5 (10.6)	1 (4.3)
Bolivia	1 (2.1)	1 (4.3)
Peru	1 (2.1)	1 (4.3)
Place of residence		
City of Buenos Aires	15 (31.9)	7 (30.4)
Buenos Aires outskirts	25 (53.2)	12 (52.2)
Buenos Aires Province	2 (4.3)	1 (4.3)
Other Argentina provinces	4 (8.5)	3 (13)
Other country	1 (2.1)	0
Education		
Incomplete elementary	5 (10.6)	3 (13)
Complete elementary	6 (12.8)	1 (4.3)
Incomplete high school	10 (21.3)	5 (21.7)
Complete high school	14 (29.8)	7 (30.4)
Trade school	6 (12.8)	4 (17.4)
Incomplete university	5 (10.6)	3 (13)
Missing data	1 (2.1)	0

Table 2
Marital and work data obtained from initial sample of patients diagnosed as having PNES in the epilepsy monitoring unit and in subsequent follow-up.

	Patients during admission N = 47 (%)	Patients contacted for follow-up n = 23(%)
Marital status		
Married/in a relationship	16 (34)	8 (34.7)
Single/not in a relationship	28 (59.6)	12 (52.2)
Divorced/separated	3 (6.4)	3 (13)
Occupational status		
Unemployed	32 (68.1)	11 (47.8)
Employed (store or housekeeper)	9 (19.1)	9 (39.1)
Full-time student	4 (8.5)	2 (8.7)
Paid medical leave	1 (2.1)	1 (4.3)
Missing data	1 (2.1)	0

for a minimum of five years before they were properly diagnosed (Table 3).

At the time of hospital admission, quantification of seizure frequency revealed that all patients were experiencing seizures (none were seizure-free), slightly more than 40% were reporting 1 or more episodes per day and practically the same percentage were reporting 1 or more episodes per week. At the time of follow-up, only 8.7% of patients reported experiencing 1 or more episodes per day, and 21.7% reported one or more episodes per week. Five patients (21.7%) reported they were seizure-free (Table 3).

When respondents who still reported having PNES were asked if they had experienced a "change" in their episodes, nearly 40% stated that there had been changes in how their episodes present, and nearly 40% reported that their episodes had not changed in presentation/appearance. When they were asked if there had been a change in seizure frequency over the past 12 months as compared with the seizure frequency they had experienced when they were diagnosed in the hospital, the majority (56.5%) stated that their psychogenic seizures were now less frequent. Only 8.7% claimed that their episodes were now more frequent, and 21.7% stated that they had not experienced a change in seizure frequency since diagnosis (Table 4).

When asked if there had been a change in the intensity of their PNES episodes over the past 12 months as compared with the seizure intensity they had experienced when they were diagnosed in the hospital, nearly half (47.8%) expressed that their episodes were now less intense than when they were initially diagnosed, 8.7% stated that the episodes were now more intense, and 21.7% stated that there had been no change in intensity (Table 4).

When patients were asked whether they agreed with the diagnosis of PNES during follow-up interview, over half (52.2%) stated that they were in disagreement, 43.5% stated that they were in agreement with the diagnosis, and 4.3% claimed not to remember having been given this diagnosis. When asked if they had understood the diagnosis and the explanation provided in the hospital, the majority (69.6%) responded affirmatively (Table 4).

When asked if the respondents had developed other symptoms of a neurological nature over the past year, 52.2% responded affirmatively. Specifically, new symptoms included speech problems (difficulty modulating volume), tingling in one or both arms, dizzy spells, problems with their vision (blurry vision, tired when using eyes), shaking, tremors, vertigo, insomnia, and medically unexplained coughs (Table 4).

The majority (65.2%) of respondents reported being prescribed psychopharmacological agents at the time of follow-up. Primarily, they were receiving benzodiazepines (clonazepam, diazepam), and a smaller percentage of respondents were being prescribed selective serotonin reuptake inhibitors (SSRIs) (sertraline, citalopram) and valproic acid, pregabalin, risperidone, and quetiapine.

When respondents were asked if they had undergone some form of psychotherapeutic treatment after they received the diagnosis of PNES, 69.6% confirmed that they had, and of those, 25% stated that psychotherapy had not benefited them in recovering from PNES. The majority (60.9%) of respondents recognized that they had sought out alternative treatments for PNES including spiritual/religious actions (attending church, praying), taking cannabidiol (CBD) oil, and practicing yoga. A smaller percentage of respondents mentioned seeking out

Table 3
Comparison of seizure characteristics at time of admission and at follow-up.

	Patients during admission N = 47 (%)	Patients contacted for follow-up n = 23 (%)
Age when first seizure occurred		
<1 year old	2 (4.3)	–
1–10 years of age	11 (23.4)	–
11–20 years of age	16 (34)	–
21 to 30 years of age	11 (23.4)	–
31–40 years of age	5 (10.6)	–
>40 years of age	2 (4.3)	–
Seizure frequency		
1 or more per day	19 (40.4)	2 (8.7)
1 or more per week	20 (42.6)	5 (21.7)
1 or more per month	4 (8.5)	4 (17.4)
1 or more per year	0	7 (30.4)
Seizure-free	0	5 (21.7)
Missing data	4 (8.5)	0

Table 4
Responses to telephonic follow-up questionnaire.

Patients contacted for follow-up n = 23 (%)	
Have psychogenic seizures changed?	
Yes	9 (39.1)
No	9 (39.1)
N/A (seizure-free)	5 (27.1)
Change in PNES frequency?	
Less frequent	18 (78.3)
More frequent	2 (8.7)
Unchanged	3 (13)
Change in PNES intensity?	
Less intense	11 (47.8)
More intense	2 (8.7)
Unchanged	5 (21.7)
N/A (seizure-free)	5 (21.7)
Did you agree with diagnosis of PNES?	
No	12 (52.2)
Yes	10 (43.5)
Do not remember	1 (4.3)
Was the explanation of the diagnosis understood?	
Yes	16 (69.6)
No	7 (30.4)
Have you developed other symptoms?	
Yes	12 (52.2)
No	11 (47.8)
Currently prescribed psychopharmacological medication?	
Yes	15 (65.2)
No	8 (34.8)
Attended psychotherapy after diagnosis?	
Yes	16 (69.6)
No	7 (30.4)
Did PNES improve with psychotherapy?	
Yes	12 (75)
No	4 (25)
Sought out alternative treatments?	
Yes	14 (60.9)
No	9 (39.1)

homeopathic treatments, consulting a faith healer, relying on meditation, and *reiki* (Table 4).

A chart review revealed that a majority of patients (87%) reported traumatic life events. The most common ones involved histories of sexual abuse, death or illness of a close relative, and violence (Table 5). Less frequent events involved miscarriage, witnessing a fire, and migratory distress. Additionally, 9 patients reported having a relative who had a history of seizures.

4. Discussion

The sociodemographic characteristics of this sample (e.g., gender, marital and occupational statuses, age at time of assessment) are similar to reports from other countries 13–16. However, age of onset was on average earlier than typically reported in other studies [8,16].

Over 60% of the sample had completed high school, trade school, or some college which is an unexpected finding since the respondents are of low SES and could have been expected to have less educational attainments. However, Argentina legally requires children to attend school until 15 years of age, and the existence of public national universities that are free of cost could have contributed to this finding. As a result, education of this sample is comparable to what has been reported in studies in the first world countries [17,18].

With regard to employment status, Duncan et al. [4] found that of 75 patients who responded to a mailed survey at 5–10 years from diagnosis, 22 (29.3%) reported that they were in paid employment. In two separate studies, 66.7% and 56.4% of patients reported being on social security disability [3,4]. In contrast, follow-up in our sample revealed that nearly half reported working or being a full-time student. These rates are somewhat surprising considering that Argentina is experiencing a profound financial crisis, currently with a 20% unemployment rate [19] and a poverty rate of 27.3% in urban settings [20]. An important observation is that those patients who obtained a job also appeared to have experienced a reduction in seizure frequency. This suggests that although seizure frequency on its own is not the best positive prognostic indicator, it may certainly affect some aspects of positive outcome.

Diagnostic latency in the present sample was greater than what is typically reported in other studies [21,22]. This is a significant issue considering the elevated costs (e.g., up to $100.000 per patient and indirect costs such as loss of employment) associated with PNES misdiagnoses [16]. Unfortunately, in Argentina, VEEG equipment in the public health system is scarce, and many patients, especially those from low SES sectors, cannot easily receive proper health services.

Several patients admitted to having relatives who had epilepsy which appears consistent with some authors' speculations regarding epilepsy as a risk factor for PNES – either due to biological mechanisms or through behavioral modeling [23].

In a long-term outcome study (5–10 years) that involved accessing family doctors' records, Duncan et al. [24] found that a majority (78.1%) of patients were not "presenting to their family doctor or to a hospital with attacks." In a complementary study, 63.5% (of 74) reported that they were still having seizures [4]. Comparably, dismal numbers (71.2%) of not having achieved seizure freedom were found after 4.1 years of PNES diagnosis in a study by Reuber et al. [3] but a subsequent more detailed examination of PNES frequency revealed that in 52.1% of responders, the date of their most recent seizure had been over 6 months before, and in 39.4%, over 12 months before. In our current study, 21.7% reported complete seizure freedom, while 30.4% reported having only a few seizures per year. In addition, when patients were asked about the intensity of their seizures and whether in their estimation, their PNES was improved or not, 47.8% reported that their PNES was less intense, and 78.3% reported that they were less frequent. This differs from results reported by McKenzie et al. [5] in which 18.7% (out of 187 subjects) had experienced an increase in episode frequency after receiving the diagnosis compared with 8.7% in our present study.

In our sample, the majority of patients who reported a reduction in seizure frequency had received psychological treatment. Although some reported that the treatment they received had not been helpful, others affirmed to have experienced an improvement as a result of the treatment. Unfortunately, none of the patients could specify the therapeutic modality they had received, and as such, this is a limitation to this study because it does not allow us to know if particular modalities (e.g., psychodynamic, cognitive behavioral, etc.) resulted in different outcomes. The vast diffusion of psychotherapy in Argentina has been analyzed by a number of authors [25,26], and although some authors report that there is limited availability of psychological treatments in low income countries [27], Argentina is an exception. Therefore, it is not surprising that over half of the respondents had received psychological treatment.

An interesting finding in the present sample is that over half of respondents claimed to be in disagreement with the PNES diagnosis. Some authors have stated that best results are obtained in those patients who have accepted the diagnosis [14,28]. In the present sample, however, improvements in seizure frequency were reported, irrespective of accepting the diagnosis or not. This puts into question whether conscious acceptance and understanding of the diagnosis is indeed necessary for there to be an improvement in this disorder.

Regardless of agreement, over half of the respondents claimed to have understood the explanation they received regarding PNES. Some authors argue that the manner in which the diagnosis is communicated to the patient is not only significant for reduction in seizure frequency [29] but can also to motivate the patient to follow through with the necessary treatment [30]. Possibly because the RMHEC has a mental health team (psychologists and psychiatrists) integrated in the program, this was a factor that benefitted this patient sample.

Exposure to psychologically traumatic events has been reported in a substantial number of patients diagnosed as having PNES [17], although, some authors have challenged its etiological relevance. Despite this, psychological trauma is still considered an important predisposing factor in PNES [28,31]. In the present sample, nearly all respondents reported experiencing traumatic and adverse life events, such as, sexual abuse and nonsexual abuse and trauma. One-third claimed to be victims of sexual abuse, which is consistent with rates of sexual abuse reported elsewhere [17] although it is unclear if they associated this with their PNES. In a previous study in which narratives of patients with PNES were analyzed [32], although patients appeared to associate the onset of their seizures with psychosocial variables but did not always associate the onset of their seizures with conflicts or violence. Other reports have suggested that patients with PNES do not necessarily recognize the connection between traumatic events and current suffering [33].

It has been reported that up to 25% of patients with PNES develop new medically unexplained symptoms (MUS) after receiving the PNES diagnosis. In this sample, over half of respondents admitted to developing other neurological-like symptoms. Unfortunately, these symptoms were not verified as medically unexplained by a physician which represents a limitation. It has been speculated that factors that contribute to the development of this type of symptom are associated with traumatic antecedents –in those who continue to experience PNES– and with the utilization of disability benefits –in those who are seizure-free– [7]. This

Table 5
Reported trauma and family antecedents.

Patients contacted for follow-up n = 23 (%)	
Trauma history	
Total trauma history	20 (87)
Sexual abuse	7 (30.4)
Violence	6 (26.1)
Death or illness of relative	6 (26.1)
Other trauma (miscarriage, accidents, migration)	4 (17.4)
Family member had seizures	9 (39.1)

phenomenon may be the result of a tendency to express psychosocial distress through somatic symptoms and seek relief in medical settings [3,34]. In the present sample, disability benefits did not appear to be a contributing factor to the development of these symptoms.

More than 65% of respondents were being prescribed psychopharmacological drugs, the most common being benzodiazepines. This is markedly higher than the reported rates in the general Argentinian population, which is approximately 15% [35]. Although prescription of antidepressants for PNES, even when combined with other treatments, appears to have inconclusive results [36,37], possibly these high rates of psychopharmacological drugs could be the result of the high rates of psychiatric comorbidities seen in PNES [38].

Respondents revealed that 60.9% had used some form of alternative or complementary strategy to better manage their PNES. It is not uncommon for patients to combine biomedical therapies with alternative therapies, religious, or mystical [39–43]. Previous studies in Argentina have revealed the use of folk and alternative healing methods in patients with epilepsy [44] and PNES [32]. Additionally, some patients reported using cannabis (CBD) oil. Recently, there has also been an increasing awareness of the effectiveness of CBD in treating certain health conditions including some forms of intractable epilepsy –which is lawfully permitted in Argentina for research– [45]. Cannabidiol may be producing an effect on anxiety; therefore, a growing number of patients with PNES may be choosing this therapy.

5. Limitations

This study has a number of limitations, one of which is that it relied solely on patient reports without cross checking these responses with current medical charts and also relied on phone interviews which may be less conducive to open and completely honest communication than a face-to-face meeting. The presence of 5 patients with a dual diagnosis complicates determining which seizure type changed in frequency or intensity when followed up. In addition, the sample consists of patients who are impoverished and who are lost to follow-up because of lost phone lines, which led to only about half of the original sample being reached. An associated limitation may be that there are differences in PNES outcome and general functioning in those patients who lost phone access, but this could not be assessed. Moreover, the small size of the sample has not allowed for statistical analyses that could better explain some of the phenomena observed (e.g., correlations between receiving psychotherapy and seizure frequency). Lastly, large variations between date of diagnosis and follow-up phone call (1 to 10 years) could have resulted in variabilities.

6. Conclusion

This is a unique study in which a sample of patients from economically disadvantaged backgrounds, diagnosed as having PNES participated in long-term follow-up. Improvements in seizure frequency and occupational status were reported. However, rejection of the PNES diagnosis, variable responsiveness to psychotherapy, use of several alternative treatments, and the emergence of novel functional neurological symptoms were also identified. Future studies will need to focus on what (e.g., communication of diagnosis, psychotherapy, alternative treatments) may have contributed to these changes. Additionally, future research directions might include effects of psychiatric diagnoses, other medical risk factors, quality of life, etc. on outcome and should empirically assess specific treatment modalities for this population.

Conflict of interests

The authors declare that there is no conflict of interest.

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References

[1] American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5. 5th ed.Arlington, VA: American Psychiatric Publishing; 2013.
[2] Martin RC, Gilliam FG, Kilgore M, Faught E, Kuzniecky R. Improved health care resource utilization following video-EEG-confirmed diagnosis of nonepileptic psychogenic seizures. Seizure 1998;7(5):385–90.
[3] Reuber M, Pukrop R, Bauer J, Helmstaedter C, Tessendorf N, Erich Elger C. Outcome in psychogenic nonepileptic seizures: 1 to 10-year follow-up in 164 patients. Ann Neurol 2003;53(3):305–11.
[4] Duncan R, Graham CD, Oto M. Outcome at 5–10 years in psychogenic nonepileptic seizures: what patients report vs. what family doctors report. Epilepsy Behav, vol. 37. Elsevier B.V; 2014; 71–4 [Internet]. Available from: https://doi.org/10.1016/j.yebeh.2014.06.011 [August 2004].
[5] McKenzie P, Oto M, Russell A, Pelosi A, Duncan R. Early outcomes and predictors in 260 patients with psychogenic nonepileptic attacks. Neurology 2010;74(1):64–9.
[6] Gedzelman ER, Laroche SM. Long-term video EEG monitoring for diagnosis of psychogenic nonepileptic seizures. Neuropsychiatr Dis Treat 2014:1979–86.
[7] McKenzie PS, Oto M, Graham CD, Duncan R. Do patients whose psychogenic non-epileptic seizures resolve, "replace" them with other medically unexplained symptoms? Medically unexplained symptoms arising after a diagnosis of psychogenic non-epileptic seizures. J Neurol Neurosurg Psychiatry 2011;82(9):967–9.
[8] Asadi-Pooya AA, Ziyaee F. Outcome of patients with psychogenic nonepileptic seizures with limited resources: a longitudinal study. Seizure, vol. 59. BEA Trading Ltd.; 2018; 1–4.
[9] Sadan O, Neufeld MY, Parmet Y, Rozenberg A, Kipervasser S. Psychogenic seizures: long-term outcome in patients with and without epilepsy. Acta Neurol Scand 2016;133(2):145–51.
[10] Kochen S, Melcon MO. Prognosis of epilepsy in a community-based study: 8 years of follow-up in an Argentine community. Acta Neurol Scand 2005;112(6):370–4.
[11] Arce H. Organización y financiamiento del sistema de salud en la Argentina. Medicina (Buenos Aires) 2012;72:414–8.
[12] Pan-American Health Organization. Salud en las Américas: Argentina [internet]. Available from: https://www.paho.org/salud-en-las-americas-2017/?post_t_es=argentina&lang=es.
[13] Asadi-Pooya AA, Sperling MR. Epidemiology of psychogenic nonepileptic seizures. Epilepsy Behav, vol. 46. Elsevier Inc.; 2015; 60–5 [Internet]. Available from: https://doi.org/10.1016/j.yebeh.2015.03.015.
[14] Thomas AA, Preston J, Scott RC, Bujarski KA. Diagnosis of probable psychogenic nonepileptic seizures in the outpatient clinic: does gender matter? Epilepsy Behav 2013;29(2):295–7.
[15] Tolchin B, Dworetzky BA, Baslet G. Long-term adherence with psychiatric treatment among patients with psychogenic nonepileptic seizures. Epilepsia 2018;59(1):e18–22.
[16] Reuber M, Mitchell AJ, Howlett S, Elger CE. Measuring outcome in psychogenic nonepileptic seizures: how relevant is seizure remission? Epilepsia 2005;46(11):1788–95 [Internet]. Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/j.1528-1167.2005.00280.x.
[17] Myers L, Trobliger R, Bortnik K, Lancman M. Are there gender differences in those diagnosed with psychogenic nonepileptic seizures? Epilepsy Behav, vol. 78. Elsevier Inc.; 2018; 161–5 [Internet]. Available from: https://doi.org/10.1016/j.yebeh.2017.10.019.
[18] Myers L, Trobliger R, Bortnik K, Zeng R, Saal E, Lancman M. Psychological trauma, somatization, dissociation, and psychiatric comorbidities in patients with psychogenic nonepileptic seizures compared with those in patients with intractable partial epilepsy. Epilepsy Behav, vol. 92(January). The Authors; 2019; 108–13 [Internet]. Available from: https://doi.org/10.1016/j.yebeh.2018.12.027.
[19] Instituto Nacional de Estadística y Censos (INDEC). Mercado de trabajo. Tasas e indicadores socioeconómicos, vol. 2, no. 236. Informes Técnicos; 2018 [Internet]. Available from: https://www.indec.gov.ar/uploads/informesdeprensa/mercado_trabajo_eph_3trim18.pdf.
[20] Instituto Nacional de Estadística y Censos (INDEC). Incidencia de la pobreza y la indigencia en 31 aglomerados urbanos. Informes Técnicos, vol. 2, no. 188; 2018.
[21] Reuber M, Fernández G, Bauer J, Helmstaedter C, Elger CE. Diagnostic delay in psychogenic nonepileptic seizures. Neurology 2002;58:493–5.
[22] Kerr WT, Janio EA, Le JM, Hori JM, Patel AB, Gallardo NL, et al. Diagnostic delay in psychogenic seizures and the association with anti-seizure medication trials. Seizure 2016;40:123–6.
[23] Reuber M. The etiology of psychogenic non-epileptic seizures: toward a biopsychosocial model. Neurol Clin 2009;27:909–24.
[24] Duncan R, Graham CD, Oto M, Russell A, McKernan L, Copstick S. Primary and secondary care attendance, anticonvulsant and antidepressant use and psychiatric contact 5–10 years after diagnosis in 188 patients with psychogenic non-epileptic seizures. Neurol Neurosurg Psychiatry 2014;85(9):954–8.
[25] Korman GP, Viotti N, Garay CJ. The origins and professionalization of cognitive psychotherapy in Argentina. Hist Psychol 2015;18(2):205–14 [Internet]. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/a0038968.

[26] Dagfal AA. Psychology and psychoanalysis in Argentina: politics, French thought, and the university connection, 1955–1976. Hist Psychol 2018;21(3):254–72 [Internet]. Available from: http://doi.apa.org/getdoi.cfm?doi=10.1037/hop0000071.
[27] Hingray C, El-Hage W, Duncan R, Gigineishvili D, Kanemoto K, LaFrance WC, et al. Access to diagnostic and therapeutic facilities for psychogenic nonepileptic seizures: an international survey by the ILAE PNES Task Force. Epilepsia 2018;59(1):203–14.
[28] Brown RJ, Reuber M. Psychological and psychiatric aspects of psychogenic non-epileptic seizures (PNES): A systematic review. Clin Psychol Rev 2016;45:157–82.
[29] Duncan R, Graham CD, Oto M. Neurologist assessment of reactions to the diagnosis of psychogenic nonepileptic seizures: relationship to short- and long-term outcomes. Epilepsy Behav 2014;41:79–82.
[30] Karterud HN, Knizek BL, Nakken KO. Changing the diagnosis from epilepsy to PNES: patients' experiences and understanding of their new diagnosis. Seizure 2010; 19(1):40–6.
[31] Reuber M, Howlett S, Khan A, Grünewald RA. Non-epileptic seizures and other functional neurological symptoms: predisposing, precipitating, and perpetuating factors. Psychosomatics 2007;48(3):230–8 [Internet]. Available from: http://www.sciencedirect.com/science/article/pii/S0033318207710459%5Cnhttp://linkinghub.elsevier.com/retrieve/pii/S0033318207710459.
[32] Sarudiansky M, Lanzillotti AI, Areco Pico MM, Tenreyro C, Scévola L, Kochen S, et al. What patients think about psychogenic nonepileptic seizures in Buenos Aires, Argentina: a qualitative approach. Seizure 2017;51:14–21.
[33] Monzoni CM, Duncan R, Grünewald R, Reuber M. Are there interactional reasons why doctors may find it hard to tell patients that their physical symptoms may have emotional causes? A conversation analytic study in neurology outpatients. Patient Educ Couns 2011;85(3).
[34] Reuber M, House AO, Pukrop R, Bauer J, Elger CE. Somatization, dissociation and general psychopathology in patients with psychogenic non-epileptic seizures. Epilepsy Res 2003;57(2–3):159–67.
[35] Leiderman E, Mugnolo JF, Bruscoli N, Massi J. Consumo de psicofármacos en la población general de la ciudad de Buenos Aires. Vertex - Rev Argentina Psiquiatr 2006;XVII:85–91.
[36] Lafrance WC, Keitner GI, Papandonatos GD, Blum AS, MacHan JT, Ryan CE, et al. Pilot pharmacologic randomized controlled trial for psychogenic nonepileptic seizures. Neurology 2010;75(13):1166–73.
[37] LaFrance WC, Baird GL, Barry JJ, Blum AS, Webb AF, Keitner GI, et al. Multicenter pilot treatment trial for psychogenic nonepileptic seizures: a randomized clinical trial. JAMA Psychiat 2014;71(9):997–1005.
[38] Perez DL, LaFrance WC. Nonepileptic seizures: an updated review. CNS Spectr 2016:1–8.
[39] Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, et al. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. JAMA 1998;280(18):1569–75 [Internet]. Available from: https://doi.org/10.1001/jama.280.18.1569.
[40] Harris PE, Cooper KL, Relton C, Thomas KJ. Prevalence of complementary and alternative medicine (CAM) use by the general population: a systematic review and update. Int J Clin Pract 2012;66:924–39.
[41] Metcalfe A, Williams J, McChesney J, Patten SB, Jetté N. Use of complementary and alternative medicine by those with a chronic disease and the general population–results of a national population based survey. BMC Complement Altern Med, vol. 10 (1). BioMed Central Ltd.; 2010; 58 [Internet]. [cited 2013 Oct 31], Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2967501&tool=pmcentrez&rendertype=abstract.
[42] Shorofi SA, Arbon P. Complementary and alternative medicine (CAM) among hospitalised patients: an Australian study. Complement Ther Clin Pract 2010;16 (2):86–91.
[43] Thomson P, Jones J, Browne M, Leslie SJ. Psychosocial factors that predict why people use complementary and alternative medicine and continue with its use: a population based study. Complement Ther Clin Pract 2014;20(4):302–10.
[44] Sarudiansky M, Korman GP, Scévola L, Oddo S, Kochen S, D'Alessio L. A life with seizures: Argentine patients' perspectives about the impact of drug-resistant epilepsy on their lives. Seizure, vol. 63. Elsevier; 2018; 52–61 [Internet]. Available from: https://doi.org/10.1016/j.seizure.2018.10.008.
[45] Honorable Senado y Cámara de Diputados de la Nación Argentina. Ley 27350 - Investigación médica y científica del uso medicinal de la planta de cannabis y sus derivados; 2017.