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Does explaining psychogenic nonepileptic seizures using either a biomedical or biopsychosocial framework affect young people's illness representations? An experimental vignette study

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ABSTRACT

Lay representations of psychogenic nonepileptic seizures (PNES) are important both for understanding public stigma and anticipating patient responses to PNES diagnosis. The current study presents the first evidence of the general public's representations of PNES and the malleability of these understandings to different ways of explaining PNES. An online experimental study exposed participants (n = 193, aged 18–25 years) to a vignette describing a case of PNES in biomedical terms, PNES in biopsychosocial terms, or epilepsy. Subsequent questionnaires assessed participants' illness representations, causal attributions, and stigmatising attitudes regarding the case about which they read. Results suggest that compared with biomedical framings, biopsychosocial explanations increased perceptions of PNES as threatening. While epilepsy was attributed to significantly more biological and less social causes than either of the PNES vignettes, causal attributions did not differ between biomedically- vs. biopsychosocially-framed PNES. Neither were there any differences between the three conditions in stigmatising attitudes towards people who experience seizures. These findings are useful for clinicians delivering a PNES diagnosis and patients disclosing a PNES diagnosis, in helping anticipate responses to these communications. Further research is required to confirm the clinical and societal significance of the study's first insights into the dynamics of lay responses to PNES.

1. Introduction

Psychogenic nonepileptic seizures (PNES) involve temporary changes in an individual's behaviour, perceptions, thoughts or feelings that can appear similar to epileptic seizures [1] but occur without the abnormal neurophysiological discharges associated with epilepsy [2]. They are typically understood as psychiatric disorders involving a dissociative response to distress, with some people retaining awareness and others having no memory of the event [3]. International prevalence estimates vary from 1.4-4.9 per 100,000 per year, according to a recent systematic review [4]. Incidence is typically higher in younger populations, with one population-based study in Norway reporting a prevalence of 59.5 per 100,000 in the 15–19-year-old cohort [5]. Public awareness and understanding of PNES tend to be low, which may exacerbate the stigma experienced by people with PNES [6]. This paper reports an experimental study that investigates how different ways of explaining PNES affect young people's understandings and attitudes regarding PNES.

1.1. Explaining the PNES diagnosis

The experience of diagnosing PNES can be challenging on both sides of the clinical encounter. Patients tend to find the diagnosis difficult to understand [7]. Qualitative studies describe ambivalent emotional responses to receiving a PNES diagnosis, with relief mixed with confusion, anger and despair [8,9,10,11,12]. Negative emotional responses are particularly linked to causal explanations of the condition as psychological, which patients can perceive as delegitimising their difficulties or implying they are feigning seizures [11,12,13,14]. Patient resistance to psychological explanations makes the delivery of the PNES diagnosis a tense interpersonal situation [15].

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Meanwhile, health professionals are often uncertain regarding how to define or manage PNES [16,17,18]. Even specialist clinicians can experience difficulty communicating with patients about the diagnosis, especially if they suspect aversion to psychological explanations of the symptoms [15,19,20]. People with PNES report experiencing hostility from health professionals, which they attribute to a belief PNES is less 'genuine' than organic disorders [11,12,13,14]. Negative conceptions of PNES, such as that they are under voluntary control or represent feigning, are indeed apparent in health professional samples [17,18,19,21,22].

The sometimes-fraught nature of PNES diagnosis necessitates reflection on how best to frame the diagnosis in clinical communication, in order to protect clinical relationships and outcomes. Biomedical models of mental health conditions emphasise the neurological, genetic and endocrinological roots of psychiatric symptoms, positioning mental illness as no different from any other medical disease [23]. Exclusively biomedical models have been criticised for failing to account for the social, psychological and behavioural dimensions of mental illness [24]. Moreover, despite intuitive expectations that biomedical framings reduce the stigma of mental illness, evidence suggests they intensify prejudice by promoting essentialisation, fear and marginalisation of people with psychiatric diagnoses [25]. In place of the biomedical model, many clinicians endorse a biopsychosocial model, which stresses the interaction between biological, psychological and social factors in generating mental illness [26]. In relation to PNES, a biomedical explanation might emphasise the mechanical role of the brain in generating events that look like seizures in response to affective triggers, which leads to a functional problem. In contrast, a biopsychosocial formulation of PNES could explain the psychogenic seizure as a response to a range of threats including social, psychological, or biological dimensions and how a seizure 'scaffold' is activated [27].

Previous evidence suggests people with PNES may prefer somatic to psychological explanations [8,12,14,28]. Those who report welcoming their PNES diagnosis tend to have interpreted that diagnosis as locating the problem in their brain's inability to manage stress or trauma [11]. However, many clinicians see PNES as fundamentally a psychological disorder [17] and, conscious of the aforementioned critiques of the biomedical model in psychiatry, may prefer to present PNES within a biopsychosocial framework. From a clinical perspective, patient acceptance of psychological factors is viewed as crucial to ensuring engagement with psychological treatments [11,29]. Any effect of diagnostic framing on therapeutic engagement or outcomes is likely mediated by how it affects lay understanding of one's seizures. Meaningful comparison between divergent diagnostic approaches therefore requires understanding their effect on illness representations.

1.2. Illness representations

Illness representations refer to the 'common-sense' understandings through which people mentally represent a particular illness. The self-regulation or common-sense model [30] proposes that illness representations can be decomposed into five dimensions: an illness' identity (symptoms and label), cause (origins), consequences (effects on one's life), timeline (duration and recurrence) and controllability (personal and treatment-related control). Meta-analytic evidence indicates a moderate to strong relationship between these dimensions and illness outcomes and coping [31]. This includes studies of epilepsy, with the well-validated Illness Perceptions Questionnaire (IPQ) and its later revision (IPQ-R) predicting outcomes such as psychological adjustment and anxiety [32,33,34].

A small body of research has explored illness representations in relation to PNES. Research comparing health professionals' perceptions of epilepsy and PNES suggests PNES is viewed as less understandable, less chronic and more personally controllable than epilepsy [22,35]. A study of 40 PNES patients found they reported similar IPQ-R scores to an epilepsy sample, including in the likelihood of attributing their seizures to psychological or physical causes [36]. However, when compared with a sample of neurologists, the PNES patients viewed seizures as less controllable and endorsed more physical and less psychological causes [36]. Similarly, a study that administered the IPQ-R to relatives of PNES patients found that patients were more averse to psychological explanations (e.g. stress) than their relatives [37]. Other research confirms that people with PNES tend to disfavour psychological explanations [28,38]. Yet this explanatory preference may have costs: a small (n = 9) qualitative study of illness representations among PNES patients [13] suggested that those who attributed their illness to biological causes were more pessimistic about their prognosis than those who endorsed primarily psychological explanations.

Minimal research has investigated whether or how illness representations are mutable to different framings of PNES diagnosis. One study evaluated patient perceptions (n = 50) following a structured communication strategy that represented PNES in terms of the brain's ability to handle stress; surveys administered 2–4 weeks following the diagnosis showed relatively high endorsement of emotional causes and a view of PNES as following a cyclical timeline [39]. However, the absence of any control group or pre-diagnosis data means it is not possible to infer the degree to which the study's diagnostic approach affected scores. No research to date has compared how presenting PNES within a biomedical or biopsychosocial framework affects lay illness representations.

1.3. Public understandings

A further notable gap in the PNES illness representations literature is the absence of data on how members of the general public understand PNES. Evaluating public conceptions is important due to the scale of social stigma that PNES patients report [6]. People affected by PNES perceive a lack of public understanding of the condition [3,40,41]. A study of 47 PNES patients in the UK found the majority had experienced stigma, at an intensity that significantly exceeded that reported by a comparative sample of epilepsy patients [6]. In particular, people with PNES battle against other people's suspicions that their seizures are fabricated [17,40,42]. People with PNES blame the psychological definition of PNES for its undermined social legitimacy, and hence reduced social and practical support relative to somatic conditions such as epilepsy [40].

The negative effects of stigma exposure can be heightened in youth mental health contexts [43]. Young people, who may struggle to understand PNES themselves, are susceptible to stigmatisation by peers, family members and teachers [40]. Young people may be particularly at risk of not being taken seriously by others and more vulnerable to aspersions of feigning seizures [40]. A study of young women aged 14–24 years found frequent experiences of delegitimization resulted in attempts to conceal one's PNES diagnosis and social withdrawal [42]. On the other hand, supportive close relationships protected against delegitimization and encouraged social participation [42].

Public awareness-raising and stigma-reduction initiatives must be a priority for improving the quality of life of people with PNES. The design of such initiatives requires data on how the lay public understands and responds to information about PNES. Since PNES is not a widely-known term, any public campaign or personal disclosure of a PNES diagnosis will require some explanation of the condition. Thus, the aforementioned debate about the consequence of biomedical vs. biopsychosocial framings in clinical

communication applies equally to non-clinical contexts. How does presenting a case of PNES using a biomedical or biopsychosocial explanation affect laypeople's illness perceptions?

The current study set out to investigate this question using an experimental vignette design. Vignettes are frequently used to study lay understandings of mental illness, measuring responses to a fictional clinical case with certain elements manipulated across experimental conditions [44]. This study compared lay responses to three vignettes: a case of PNES presented in biomedical terms, PNES with a biopsychosocial framing, and a case of epilepsy, a disorder with similar symptoms to PNES but whose somatic origins are not contested. Since young people are a group particularly vulnerable to PNES stigma [40,42], the study focused on a population of people aged 18–25 years. Given the lack of previous evidence on public attitudes regarding PNES, the study did not propose a unidirectional hypothesis but tested whether illness perceptions, attributions and stigma would significantly differ following exposure to a biomedical vs biopsychosocial account of PNES.

2. Methods

2.1. Participants

A priori power calculations using GPower indicated a sample of 158 was required to detect a medium effect size with a power of .8 and alpha of .05. A convenience sampling method was used which involved posting adverts with links to an online study of 'attitudes to young people who experience seizures' on social media, online research recruitment platforms, and a university campus in Ireland. Participation was restricted to people aged 18–25 years. A total of 217 participants opted into the study. Six withdrew consent prior to exiting the study and 18 were excluded due to failing an attention check (see below), leaving a valid sample of 193.

A majority (59.1%, n = 114) of participants identified as female, with 28% (n = 54) male and 13% (n = 25) either not answering or stating their gender identity was unlisted. Their average age was 21.1 (SD = 2.1). Half (50.8%; n = 94) were based in Ireland, with 13.5% (n = 26) in the UK, 6.2% (n = 12) in the Netherlands and the remainder from 15 other countries internationally. In total, 72 (37.3%) participants stated that they personally knew someone who had experienced nonepileptic seizures; 35 (18.1%) defined this person as a casual acquaintance, 19 (9.8%) a close friend, 16 (8.3%) a family member, and 5 (2.6%) themselves.

2.2. Materials & measures

Three vignettes (see Supplementary Material) were developed by a senior clinical psychologist working in paediatric neurology, who had a doctorate in clinical psychology and over 10 years of experience in paediatric psychology. All vignettes were of similar length and structure, describing an 18-year-old who experienced seizures. Each vignette included a diagnosis and a different clinical explanation of these seizures. The Epilepsy vignette defined the seizures as resulting from "abnormal electrical activity in the brain". The PNES-Biomedical vignette attributed the seizures to "something wrong with the signals being sent across the brain". The PNES-Biopsychosocial vignette attributed the seizures to "difficult emotional experiences" that the brain "tried to protect" against. Since prior vignette research suggests the gender of the case can influence responses [45], separate male ('John') and female ('Jane') versions of each vignette were created.

After reading the vignette, participants completed a battery of scales. The Brief Illness Perception Questionnaire (BIPQ) is a nine-item scale designed to rapidly assess cognitive and emotional representations of illness [46]. The BIPQ shows internal, concurrent and predictive validity equivalent to the considerably longer IPQ-R, with the advantage of faster administration [46]. BIPQ items assess perceived consequences, timeline, personal control, treatment control, identity, concern, understanding and emotional response on 10-point Likert scales. However, the BIPQ item assessing the 'cause' dimension relies on open responses that are not directly quantifiable. As causal attributions are a particularly important aspect of PNES beliefs [11,14], the study included additional dedicated measures of causal attributions: the Biological/Genetic and Social/Stress subscales from the validated Mental Illness Attribution Questionnaire (MIAQ) [47]. The former comprises seven items measuring people's endorsement (on 7-point Likert scales) of a range of biological causes (e.g. "chemical imbalance in the brain", "genetics or heredity"), while the latter includes 17 factors measuring attributions to psychosocial factors (e.g. "traumatic experiences", "loneliness"). Due to its length, the MIAQ also included an attention check (instructing the participant to select a particular number on that item), the failure of which rendered that response ineligible. Finally, the questionnaire included a modified version of Bogardus' [48,49] Social Distance Scale, the most frequently used measure of mental illness stigma [50]. This measure used a 7-point Likert scale to assess people's willingness to associate with the vignette character in a range of contexts (e.g. as a neighbour, co-worker, or housemate).

Materials were piloted with a small convenience sample (n = 4) to confirm the comprehensibility of vignettes, questions and instructions.

2.3. Procedure

Data were collected in February-March 2022. Ethical approval was granted by the University College Dublin School of Psychology ethics committee. All participants gave informed consent to participate by ticking a box at the start of the study and were offered an opportunity to withdraw consent after the post-study debriefing page, which explained the full research question and design.

The study was hosted online using the Qualtrics survey programme. The software randomly assigned participants to view one of the three vignettes, in either the male or female form. The vignettes were immediately followed by an attention check that verified accurate recall of the text, and a further attention check was embedded within the MIAQ (i.e. "Please select '6' for your answer here"). Participants completed the BIPQ, Mental Illness Attributions Questionnaire and Social Distance Scale on separate pages. The survey ended with a series of questions assessing basic socio-demographic classifications and participants' degree of acquaintance with people with PNES.

2.4. Analysis

Qualtrics data were imported into SPSS v26 for cleaning and analysis. Preliminary checks established the data's suitability for parametric analysis, internal reliability of the scales, and equivalence of experimental conditions. While the BIPQ is designed for its 8 individual items to be separately analysed, there is also precedent for combining the items into a single composite measure indicating the degree of threat imputed to the illness [51]. To avoid inflating the risk of Type I error due to multiple comparisons, the latter approach was taken in the current analysis. Four Analyses of Covariance (ANCOVAs) were used to examine the effects of the experimental condition (vignette) on the dependent variables (Illness Perceptions-Threat, Social/Stress Attributions, Biological/Genetic Attributions, Social Distance). As the gender of the perceived and perceiver are known to influence attitudes to people with mental illness [45,52], vignette gender and participant gender

(restricted to male/female due to the low number of people identified as unlisted/another gender) were included as covariates in all analyses. Personal acquaintance with people with nonepileptic seizures was also included as a covariate due to previous evidence that personal familiarity affects mental illness attitudes [53]. Significant ANCOVA effects were followed up with post hoc pairwise comparisons with Bonferroni corrections. Missing data were excluded pairwise. Given the exploratory nature of the research, the analysis did not apply any correction for multiple comparisons, but measures of effect size were calculated throughout.

3. Results

3.1. Preliminary checks

The internal reliability of outcome measures was assessed via Cronbach's alpha tests. Good reliability was shown for Social Distance (α = .83), Social/Stress Attributions (α = .97) and Biological/Heredity Attributions (α = .89). Reliability of the 8-item Illness Perceptions composite measure was less than desired (α = .55); since omitting one item (Item 7; Understanding) increased reliability to α = .62, this item was excluded from the computation of the composite variable. Skewness and kurtosis values indicated all scales were suitable for parametric analysis.

In total, 70 participants viewed the Epilepsy vignette, 62 the PNES-Biomedical and 61 the PNES-Biopsychosocial. The survey programme randomly assigned 94 participants to the male version of the vignette (John) and 99 to the female version (Jane). Chi-square tests confirmed the experimental conditions did not significantly differ in the distribution of gender or proportion reporting personal acquaintance with nonepileptic seizures, while a one-way ANOVA found no significant difference between the groups in age (all $p > .05$).

3.2. Descriptive statistics

Table 1 contains descriptive statistics for the four scales across experimental conditions.

Fig. 1 displays mean values for each individual BIPQ item across the experimental conditions.

3.3. Effects of experimental condition

To test the effect of experimental condition on the four composite variables, one-way ANCOVAs were computed with vignette gender, participant gender and personal acquaintance with nonepileptic seizures as covariates.

Results revealed a significant effect of experimental condition on Illness Perceptions-Threat, $F(2,162) = 3.61$, $p = .029$, $\eta_p^2 = .04$. Post-hoc pairwise comparisons indicated that participants in the PNES-Biopsychosocial condition rated the illness as more threatening than participants in the PNES-Biomedical condition ($d = .52$). The Epilepsy condition showed no significant differences from either of the Non-Epileptic conditions.

Experimental condition had a significant effect on Social/Stress Attributions ($F(2,153) = 44.9$, $p < .001$, $\eta_p^2 = .37$) and Biological/

Table 1
Descriptive statistics.

	Illness Perceptions-Threat		Social/Stress Attributions		Biological/Heredity Attributions		Social Distance	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Epilepsy	7.24	.96	2.51	1.15	4.87	1.08	2.02	.82
Non-Epilepsy Biomedical	7.11	.95	4.28	1.22	3.17	1.45	2.16	.86
PNES-Biopsychosocial	7.58	.86	4.59	1.19	3.34	1.55	2.03	.83

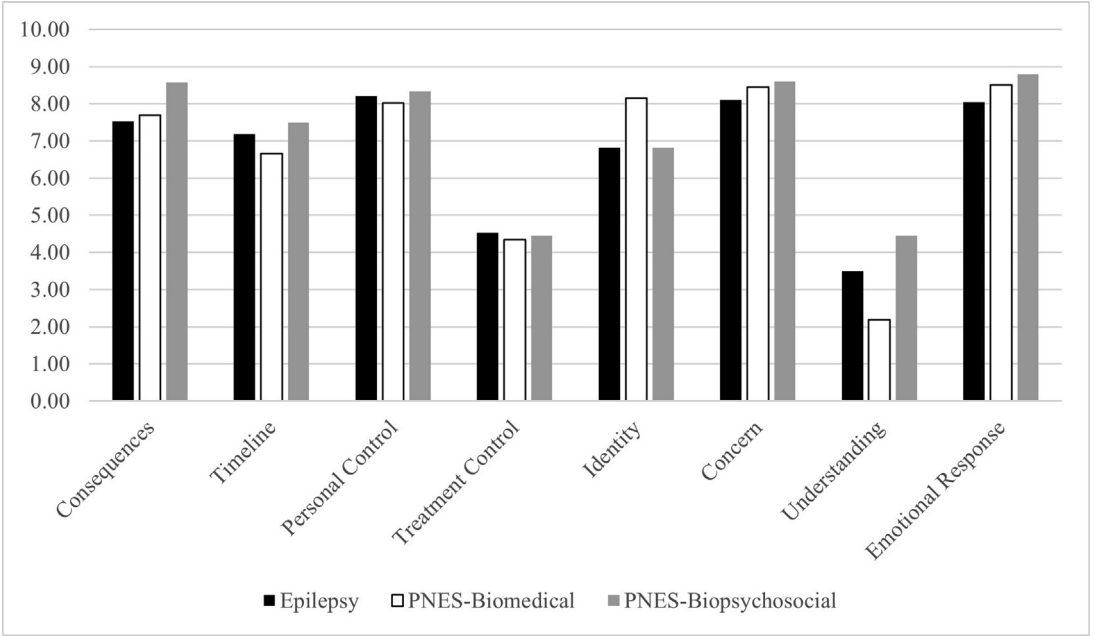

Fig. 1. Mean BIPQ scores across experimental conditions.

Heredity Attributions ($F(2,152) = 34.41$, $p < .001$, $\eta_p^2 = .31$). Post hoc pairwise comparisons showed that compared with the PNES-Biomedical vignette, the Epilepsy vignette provoked significantly less attribution to Social/Stress causes ($d = 1.49$), and significantly more attribution to Biological/Heredity causes ($d = 1.33$). Similarly, compared with the PNES-Biopsychosocial vignette, the Epilepsy vignette prompted more attribution to Biological/Heredity ($d = 1.15$) and less to Social/Stress ($d = 1.78$) causes. There were no significant differences in attributions between the Biomedical and Biopsychosocial versions of the Non-Epilepsy vignette.

Experimental condition showed no significant effect on Social Distance, $F(2,162) = .74$, $p = .48$, $\eta_p^2 = .01$.

4. Discussion

Debates about the optimal way of delivering a PNES diagnosis lack evidence on the differential effects of alternative diagnostic approaches on lay understandings. Moreover, minimal research has investigated PNES understandings and attitudes among the general public. The current study represents the first to compare lay responses to biomedical and biopsychosocial framings of PNES, relative to a standard case of epilepsy. The study revealed little evidence of stigma attached to any of the three seizure contexts. While PNES was viewed as less biogenetic in origin than epilepsy, causal attributions were not affected by framing PNES using biomedical vs. biopsychosocial terms. However, biopsychosocial framings of PNES led to a sense of the illness as more threatening than biomedical framings.

The association of biopsychosocial accounts with a heightened sense of threat is a novel finding in the literature. Inspection of the individual BIPQ items shows that the biopsychosocial condition was particularly likely to be seen as consequential and longer-lasting, compared with the biomedically-framed vignette. This contradicts evidence from other mental illness contexts, which links biomedical explanations with greater prognostic pessimism [54]. The majority of this previous research focuses on common psychiatric disorders such as schizophrenia and depression, with no previous experimental research studying lay responses to biomedical explanations of PNES. The departure from prior findings corroborates suggestions that the relationship between biomedical explanations and attitudinal outcomes may present differently for different diagnoses [55,56]. This underlines the need for specificity and attention to context in the debate about alternatives to the biomedical model of mental illness.

The mechanism behind the effect on PNES threat perception is unclear. Previous research suggests the effects of biomedical explanations are mediated through biogenetic attributions, which can cultivate essentialist views of people with a certain diagnosis [54]. However, this explanation does not hold for the current study, since the experimental manipulation did not directly affect causal attributions: the biopsychosocial and biomedical vignettes elicited similar levels of attribution to social/stress and biological/genetic causes. Stronger threat perception may result from the biopsychosocial vignette's reference to stress and difficult emotional experiences, which were not raised in the biomedical vignette. Alternatively, perhaps the biomedical vignette's use of a simple metaphor (computer hardware/software) increased the accessibility of the explanation. Further research is required to disentangle the key 'active ingredients' of biopsychosocial vs. biomedical explanations that may modulate a sense of threat.

The finding that participants' causal attributions did not discriminate between the biopsychosocial and biogenetic vignettes is interesting given previous evidence that causal attributions can be manipulated using experimental vignette methods [54]. However, leaving the experimental manipulation aside, the causal attributions data can also be interpreted descriptively, giving first evidence into the lay public's attributions for PNES. The data suggest that PNES are seen as more social than biological in origin, and significantly more social and less biological than epileptic seizures. This aligns with previous studies of health professionals and relatives of people with PNES, both of whom prioritised psychosocial rather than biological explanations of PNES [36,37]. In contrast, prior research suggests PNES patients favour biological explanations [13,28,36,37,38]. Taken together with this previous research, the results raise the possibility of a gulf between the attribution patterns of those who do and do not experience PNES.

These different understandings of PNES could raise difficulties for PNES patients in communicating with others about their seizures or diagnosis. Understanding the causes of seizures is particularly salient for those who experience PNES [11,14], who often implicate the psychological explanation of PNES in their experience of social delegitimization [40]. Previous studies have indicated that individuals with psychogenic seizures report greater levels of perceived stigma than those who experience epileptic seizures [6]. The current study found no difference in desired social distance from a character experiencing epileptic or PNES seizures. Indeed, stigma was low across all seizure types. This may be related to the sample's age profile; previous research suggests younger people show less mental illness stigma [52]. Alternatively, the similar social distance scores across all vignettes could indicate that provision of a comprehensible explanation of PNES, whether through biopsychosocial or biomedical terms, helped reduce stigma to levels equivalent to epileptic seizures. Further research that also collects pre-explanation measures of stigma would help resolve this ambiguity.

4.1. Implications

Results have implications for the framing of public information campaigns and personal disclosures of one's PNES diagnosis. Previous qualitative research has linked patients' disfavouring of psychological explanations with the fear their difficulties will be delegitimised or seen as self-induced [8,12,14,28]. This study raises the additional possibility that biopsychosocial framings may render the seizures more threatening. Caution is recommended against assuming that, as with other mental illness diagnoses, biomedical framings of PNES risk exacerbating negative perceptions; the current research reveals no evidence for this prospect. Optimal tailoring of PNES explanations requires further research investigating whether it is possible to present psychosocial explanations in ways that avoid heightening threat.

The research is particularly pertinent to contexts in which young people are present. Schools and universities are often targets of mental illness awareness-raising and stigma-reduction efforts [57]. Since PNES are frequently present in youth populations [5], evidence on how this age cohort interprets PNES information can help predict peer responses to disclosures of PNES experiences.

While data from this general public sample cannot be extrapolated to a clinical population, members of the public do represent potential users of mental health services. The results therefore may provide some insight for clinicians explaining a new PNES diagnosis to a service user for whom the diagnosis is largely unfamiliar. Effective communication of the diagnosis and acceptability of a diagnostic formulation are considered essential for facilitating positive clinical outcomes. Caution should be exercised that presenting PNES using a biopsychosocial framework does not unintentionally heighten the threat associated with the diagnosis. However, it is worth noting some prior evidence indicating that patients' perceived severity of a PNES diagnosis predicted better adherence to psychiatric treatment, and this was related to how

the diagnosis was delivered [58]. Further research is therefore required to confirm whether heightened threat perceptions have positive or negative implications for diagnostic acceptability, adherence to treatment and clinical outcomes.

4.2. Limitations

As the first study of the lay public's understanding of PNES, the current research represents a valuable contribution to the literature. However, it is subject to several limitations that should be considered when appraising its results. A reliance on convenience sampling led to certain sample imbalances, notably an overrepresentation of women and Irish residents. The request for participants to opt into a study of attitudes to seizures may account for the presence of a strong minority of people who personally knew someone who experienced PNES. This level of personal familiarity may have affected the data, though this variable was evenly distributed across experimental conditions and controlled in statistical tests. To validate results, the experimental analyses were re-run excluding those with personal familiarity with PNES and produced the same pattern of findings, despite the lower sample size. It is worth noting previous evidence that family members' illness perceptions are more similar to those of health professionals than to their relatives with PNES [36,37]. As such, the variable that shifts attitudes may be directly experiencing PNES, rather than indirect familiarity: only 5 participants reported personal experience of PNES.

The use of vignettes poses another methodological limitation. Although experimental vignettes have the advantage of allowing a high degree of researcher control, they can have limited external validity if they do not accurately reflect real-world occurrences [44,59,60]. Vignettes for this study were written by a clinical psychologist to reflect their real-world experience of clinical cases and communications. However, idiosyncratic features of vignettes may unintentionally affect responses; for instance, the word 'threat' occurred in the Biopsychosocial vignette, which may have activated threat perceptions (though none of the BIPQ items contained an explicit reference to 'threat'). Future research that moves beyond textual vignettes, for example to incorporate video stimuli or interaction with actual PNES patients, may produce more conclusive results.

Limitations also pertain to the measures used. The BIPQ was chosen as its brevity protected participant attention and engagement, without compromising psychometric quality relative to the longer IPQ-R [46]. However, the composite BIPQ measure had suboptimal internal reliability and lacked the analytic nuance of the IPQ-R's distinct subscales. Quantitatively assessing causal attributions required the addition of a separate instrument, with Knettel's [47] measure offering a validated tool. For the sake of brevity, the study extracted just two of Knettel's [47] seven subscales. This decision aligned with the expansive empirical literature assessing causal attributions, which focuses on a binary between biogenetic and social causal beliefs [25,55,61]. However, recent studies indicate that many people endorse multiple types of causal beliefs, which may combine to give rise to stigma [62]. Consequently, a model dichotomising the dominant types of causal attributions may fail to capture the complexities involved in people's aetiological beliefs, concealing the impact of unexpected attributions [47]. Future studies could investigate the potential contribution of such attributions to stigma towards individuals with psychogenic seizures.

Finally, as this was an exploratory study and the first to investigate PNES illness perceptions among the general public, the hypotheses were non-directional and the analysis did not correct for multiple comparisons. Further hypothesis-driven research is necessary to confirm and extend findings.

4.3. Conclusion

Lay representations of PNES are important both for understanding public stigma and anticipating patient responses to PNES diagnosis. The current study presents the first evidence of understanding of PNES among the general public, and their malleability to different ways of explaining PNES. Results tentatively suggest that compared with biomedical framings, biopsychosocial explanations may exacerbate young people's perceptions of PNES as threatening, but do not affect causal attributions or stigmatising attitudes towards people who experience PNES. These findings are useful for clinicians delivering a PNES diagnosis and patients disclosing a PNES diagnosis, who may be interested in anticipating people's responses to these disclosures. Further research is required to confirm the clinical and societal significance of the study's first insights into the dynamics of lay understandings of PNES.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.yebeh.2023.109186.

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