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Determinants of Health-Related Quality of Life of Patients With Focal Epilepsy: A Systematic Literature Review

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CONCLUSIONS

1. This systematic literature review (SLR) identified multiple factors associated with lower health-related quality of life (HRQoL) in patients with focal epilepsy

2. Depression and anxiety were among the most significant and frequent determinants of HRQoL change

3. Other relevant and frequent determinants of HRQoL change included cognition, anti-seizure medication (ASM) adverse events (AE), seizure freedom, and employment

4. A comprehensive understanding of the modifiable determinants of HRQoL is relevant to patient health and well-being and can inform clinical practice and observational/interventional studies

INTRODUCTION

▶ Epilepsy affects approximately 61.4 per 100,000 people worldwide with ≈61% of cases represented by focal epilepsy[1,2]
  ▶ Focal epilepsy is a debilitating condition that can have significant negative impacts on HRQoL that exceed those observed for general populations[2,3] and among patients with generalized epilepsy[2]
  ▶ Patients with focal epilepsy can also experience work-related impacts such as absenteeism, presenteeism, or loss of employment[4]
  ▶ Several studies have been published on HRQoL in patients with focal epilepsy; however, the main determinants of HRQoL have not been comprehensively examined
  ▶ There is a need to study HRQoL in patients with focal epilepsy to derive care plans that maintain patients their quality of life

References: 1. Beghi E. Neuro Epidemiology. 2020;54;185-191. 2. Ioannou P, et al. Brain Behav. 2022;12;e2589. 3. Siebenbrodt K, et al. Neurol Res Pract. 2023;5:41. 4. Gupta S, et al. Epilepsia Open. 2017;2(2);199-213. 5. Page M, et al. BMJ. 2021;372:n71. 6. Shakhatreh L, et al. Epilepsia. 2023;64(7):1709-1721. 7. Cramer JA, et al. Epilepsia. 1998;39(1):81-88.

OBJECTIVE and METHODS

Objective
▶ To identify and weight the determinants of HRQoL among patients with focal epilepsy via a systematic literature review

Methods
▶ The SLR was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines as summarized in **Table 1**[5]
▶ An electronic search was conducted across Google Scholar and PubMed to identify articles that reported on the association between HRQoL, employment status, and a range of demographic, psychosocial, and epilepsy-related factors and medical comorbidities in patients with focal epilepsy
▶ Studies were included based upon predetermined criteria (**Table 1**); and consensus screening by two independent reviewers

Table 1. Details of Systematic Literature Review Methodology

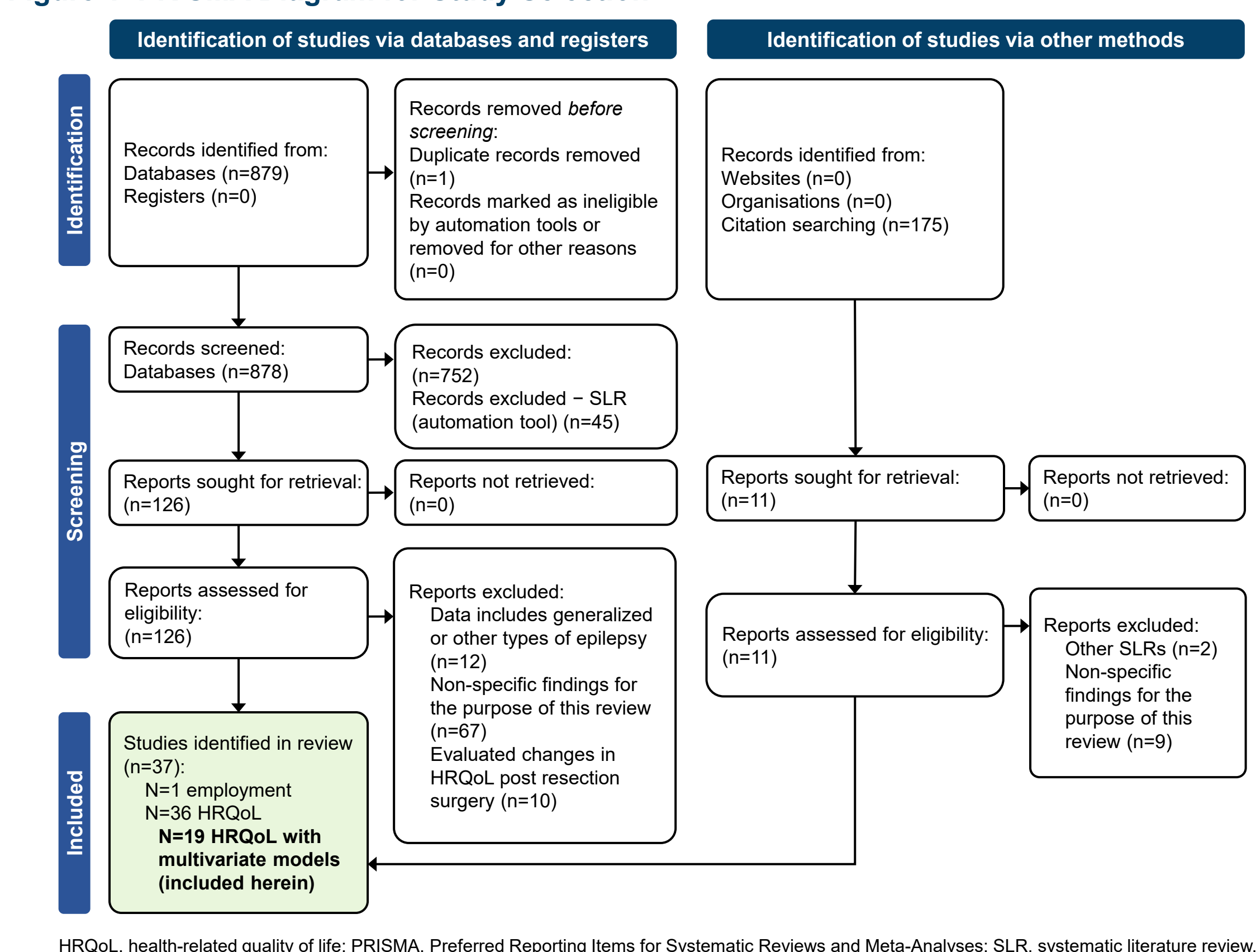| Research question	What are the determinants of HRQoL in patients with focal epilepsy?
Databases	▶ PubMed and Google Scholar
Timeframe	▶ Full text articles and reviews: January 1, 1900, to February 19, 2023
Inclusion criteria (PICOS criteria followed)	▶ (P) Patients diagnosed with focal epilepsy, all ages ▶ (I) Both interventional and non-interventional studies were considered ▶ (O) Study assessed the HRQoL or disease burden in this population or in their caregivers ▶ (S) All study designs were evaluated; however, only studies that quantified data via multivariate models (e.g., reporting β-values, adjusted R^2, magnitude of variance) or univariate analyses (eg, reporting Pearson or Spearman's correlations, Kendall's Tau statistic) were included
Exclusion criteria	▶ Studies that only included comparative descriptive data (t-test, Mann-Whitney U Test) ▶ Not available in English language ▶ Grouped focal epilepsy data with generalized epilepsy data without distinction ▶ Studies evaluating changes in HRQoL after resective surgery (comprehensive SLR on this topic recently published[6])
Data extraction	▶ Data was extracted from studies with measures of HRQoL for patients with focal epilepsy that also included any variable examined as potentially impacting the outcome (e.g., determinants) ▶ We accepted all significance levels as determined by study authors, noting there was variability in thresholds chosen and whether multiplicity was accounted for; when the threshold was not specified, $p<0.05$ was considered significant
Publication date	▶ No limit
Country	▶ No restriction

HRQoL, health-related quality of life.

RESULTS

Study Selection
▶ Of a total of 879 studies retrieved, 37 studies were selected (**Figure 1**)
  – 36 studies examined HRQoL outcomes and 1 study examined impact to employment status
▶ Of the 36 HRQoL studies examined, over half (n=19, 53%) leveraged multivariate analysis (with or without accompanying univariate data) and the remaining 17 studies (47%) utilized a univariate only approach
▶ The reported findings herein were limited to the HRQoL studies leveraging multivariate models of analysis (n=19)
  – Additional analysis was conducted since the time of abstract submission; as a result, the results presented herein reflect a refinement of the data originally presented

Figure 1. PRISMA Diagram for Study Selection

HRQoL, health-related quality of life; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SLR, systematic literature review.

Overview of Studies
▶ Of all the selected studies (N=19), the majority were conducted in adults only (n=17)
▶ Most studies were European based (13/19 [68%]) and the majority of studies used a cross-sectional study design (16/19 [84%])
▶ The Quality of Life in Epilepsy-31 (QOLIE-31)[7] was the most frequently used HRQoL measure (13/19 studies [68%]); **Figure 2**
▶ Temporal lobe epilepsy (TLE) was the most common subset of FE studied

Determinants of HRQoL Decline in Focal Epilepsy Patients
▶ The studies examined a wide range of demographic and clinical variables (n=28): demographic factors (sex, age, driving, education, and employment), clinical characteristics (laterality of temporal lobe epilepsy, surgery [yes/no], presence of general tonic-clonic seizures, presence of aura, and having HS), epilepsy-related factors (age of onset, disease duration [positive/negative correlation], seizure frequency and freedom, time between seizures, number of ASMs used, efficacy of ASMs, ASM severity/AE burden), comorbidities (presence of comorbidities, depression, anxiety, and psychiatric disorders), cognition (cognitive function/measures, memory, and intelligence level), and executive function
▶ Unique issues (n=5) were also explored in individual studies such as sleep, temperament, psychosocial function, religion/spirituality, and patient-perceived change

▶ The most commonly examined variables (in adjusted models) included depression (n=13/19 studies [68%]), number of ASMs (n=11/19 [58%]), seizure frequency (as continuous number; n=10/19 [53%]), anxiety (n=9/19 [47%]), duration of disease (n=8/19, [42%]), and cognition (n=8/19 [42%]) (**Figure 3**)
  – Depression, anxiety, and cognition were significant contributors to HRQoL when these were studied (12/13 [92%], 8/9 [89%], and 6/8 [75%], respectively)
  – In addition, several less frequent but impactful determinants of HRQoL were identified in adjusted models including ASM severity/AE burden (5/5 studies), attainment of seizure freedom (dichotomized by Engel class I [absence] vs II, II,I and IV [presence]; 3/4 studies), and employment (5/7 studies)

Figure 2. Most Commonly Used HRQoL measurements
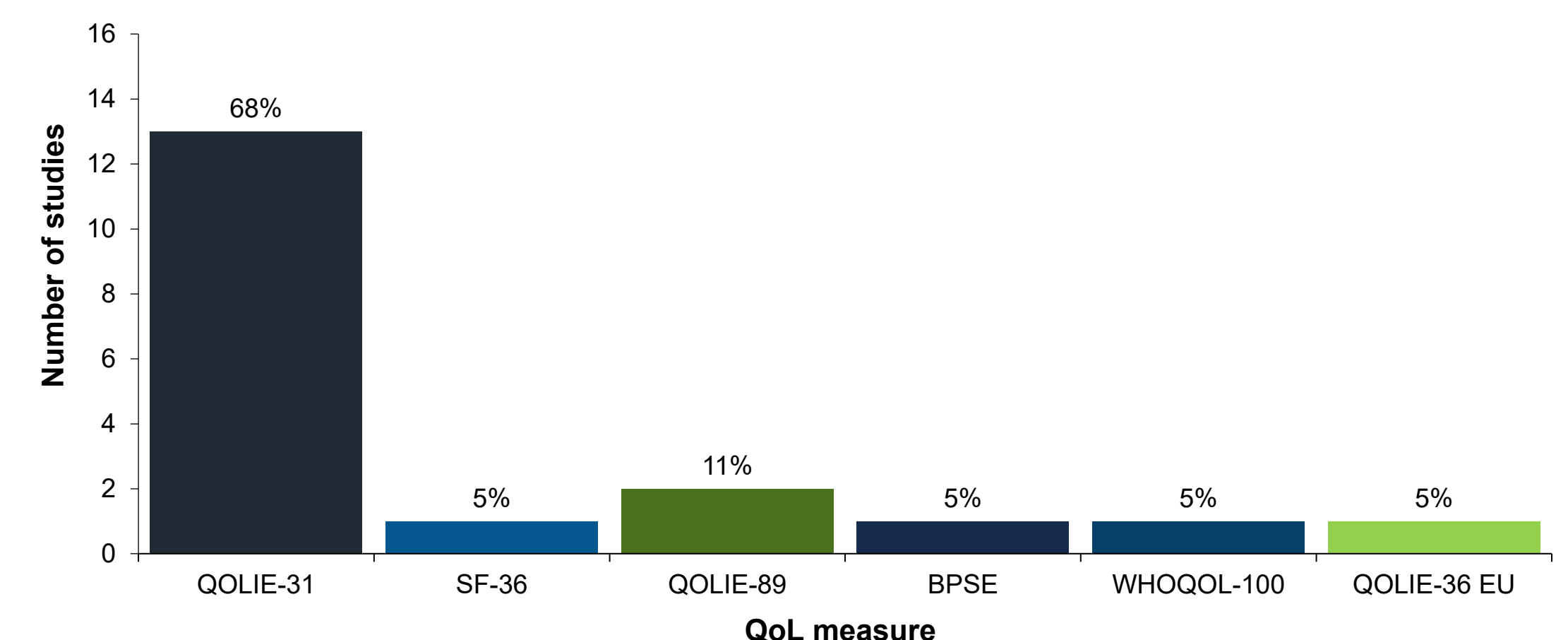
BPSE, Bonner Psychsoziale Skalen fur Epilepsie; HRQoL, health-related quality of life; QOLIE-31, Quality of Life in Epilepsy Inventory 31; QOLIE-36 EU, Quality of Life in Epilepsy Inventory 36 European Union; QOLIE-89, Quality of Life in Epilepsy Inventory 89; SF-36, 36-Item Short Form Survey; WHOQOL-100, The World Health Organization Quality of Life.

Figure 3. Impactful Determinants Often Studied and/or Determinants Less Often Studied but Commonly Associated With Poor HRQoL in Patients With Focal Epilepsy
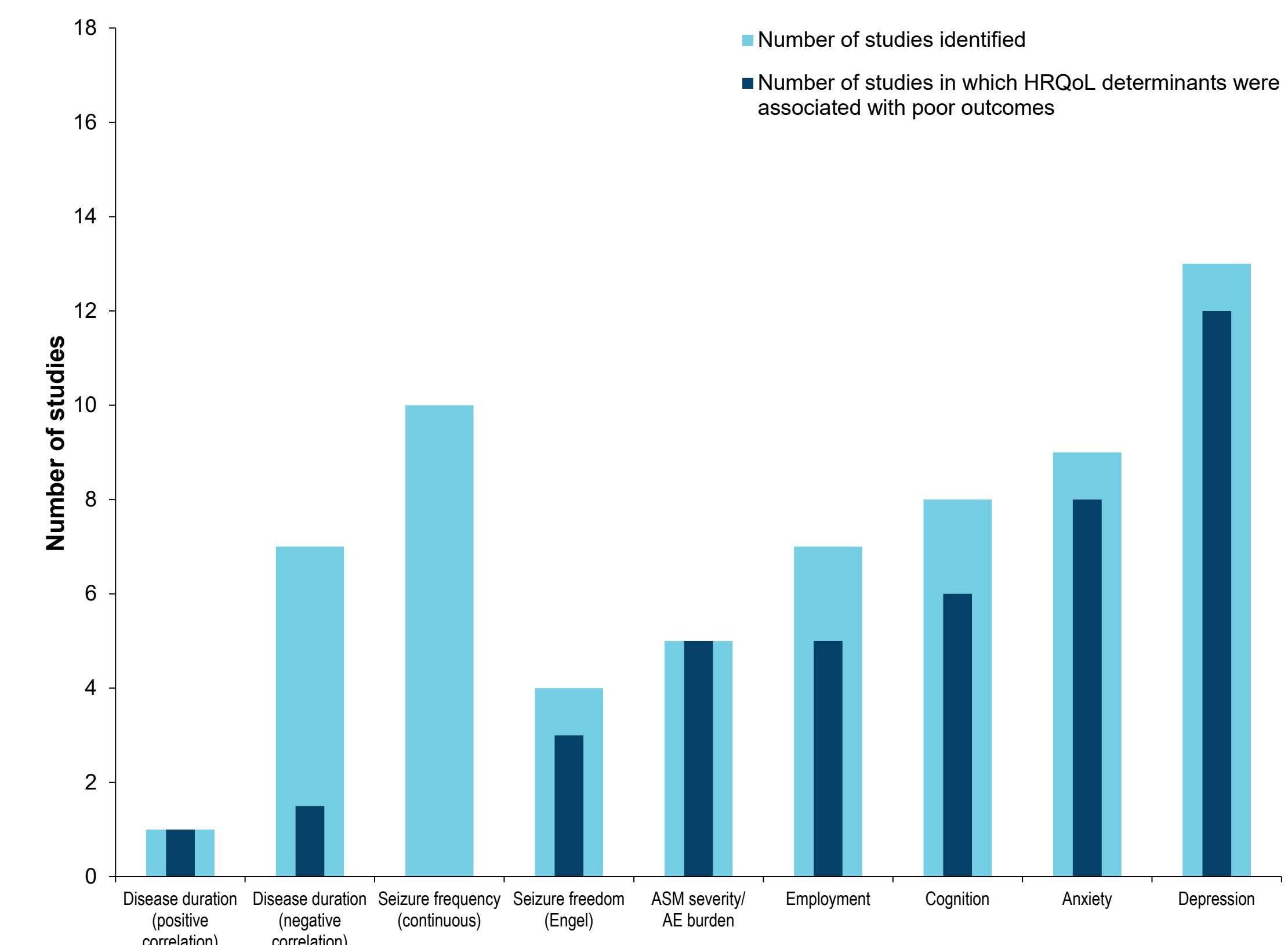
AE, adverse event; ASM, anti-seizure medication; HRQoL, health-related quality of life.
aIncludes 1 study where psychosocial adjustment (which included employment as one component) was associated with HRQoL.
bCognition includes cognitive function/measures, memory, and executive function.