ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES

Detection and impact of co-morbid mental health conditions in people with epilepsy in rural Ethiopia

Dissertation for the degree of Doctor Of Philosophy (PhD) in Mental Health Epidemiology, Addis Ababa University, College of Health Sciences, School of Medicine and School of Public Health, Department of Psychiatry

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SCHOOL OF GRADUATE STUDIES

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SCHOOL OF MEDICINE & SCHOOL OF PUBLIC HEALTH

Detection and impact of co-morbid mental health conditons in people with epilepsy in rural Ethiopia

A dissertation submitted to School of Medicine and Public Health, Addis Ababa University in partial fulfilment of the requirements for the degree of Doctor of Philosophy (PhD) in Mental Health Epidemiology

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EXAMINING BOARD DISSERTATION APPROVAL SHEET

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Detection and impact of co-morbid mental health conditions in people with epilepsy in rural Ethiopia

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2. Tsigebrhan R, Fekadu A, Medhin G, Newton CR, Prince MJ, Hanlon C. Comorbid mental disorders and quality of life of people with epilepsy attending primary health care clinics in rural Ethiopia. PLoS One. 2021;16(1):e0238137
3. Tsigebrhan R, Fekadu A, Medhin G, Newton CR, Prince MJ, Hanlon C. Performance of primary health care workers in detection of mental disorders comorbid with epilepsy in rural Ethiopia. BMC Family Practice. 2021 Dec;22(1):1-0.
4. Impact of co-morbid common mental disorder (CMD) symptoms in people with epilepsy in Ethiopia on quality of life and functional disability: cohort study(sent to co-authors)
5. Experience and perceptions of mental ill-health in people with epilepsy in rural Ethiopia: a qualitative study (submitted to a journal)

Abbreviations and acronyms

ADHD	Attention Deficit Hyperactivity Disorder
ASISST	Alcohol, Smoking and Substance Involvement Screening Test
AXIS	Appraisal tool for cross-sectional studies
BAI	Beck anxiety inventory
BDI	Beck Depression Inventory
CCEI	Crown Crisp Experiential Index
CI	Confidence Interval
CINAH	Cumulative Index to Nursing and Allied Health Literature
CMD	Common mental disorder
DALYs	Disability Adjusted Life-years
DfID	Department for International Development
DSM	Diagnostic and Statistical Manual of mental disorders
EEG	Electroencephalogram
ES	Effect Size
FIS	Family Interview Schedule
GAD-7	Generalized anxiety disorder
GHQ	General Health Questionnaire
GIM	Global Index Medicus
HAMD	Hamilton depression rating scale
HADS	Hospital Anxiety and Depression scale
HEW	Health Extension Worker
HIC	High Income Country
ICD	International Classification of Disease
ILAE	International League Against Epilepsy
IQR	Interquartile range
JME	Juvenile myoclonic epilepsy
LAMICs	Low- And Middle-Income Countries
MDI	Major Depression Inventory
MINI	Mini International neuropsychiatric interview
MNS	Mental, neurological and substance use disorders

MOS-36	Short version of SF-36
MTLE	Mesial temporal lobe epilepsy
NDDIE	Neurological Disorders Depression Inventory for epilepsy
NCD	Non-Communicable Diseases
NOS	Newcastle–Ottawa Scale
OPCRIT	Operational Criteria for Psychotic and affective illnesses
PHC	Primary Health Care
PHQ	Patient Health Questionnaire,
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analysis,
PRIME	PRogramme for Improving Mental health CarE
PROSPERO	Prospective Register for Systematic Reviews
PWE	People with Epilepsy
QOLIE	Quality Of Life in Epilepsy
SAS	Self-rating Anxiety Scale
SCID	Structured Clinical Interview for DSM IV
SDS	Self-rating Depression Scale,
SEM	Structural Equation Modeling
SMR	Standardized Mortality Ratio
SPS	Social phobia scale
SRQ-20	Self Reported Questionnaire
WHODAS	World Health Organization Disability Assessment Schedule

Summary

Background Research evidence from around the world indicates high levels of co-morbid mental conditions among people with epilepsy (PWE) compared to the general population. Nevertheless, there is very limited evidence regarding the detection or impact of co-morbid mental health conditions in PWE from low-income country settings.

Therefore, the main **aim** of this PhD thesis was to investigate the detection, impact and lived experience of co-morbid mental health conditions in PWE in a rural Ethiopian setting.

Specific objectives were to:

- To synthesis evidence examining the association of co-morbid mental health conditions in people with epilepsy with quality of life or functioning in LAMICs**.**
- Evaluate the performance of primary health care workers (PHC) in identification of co-morbid mental health conditions in PWE attending PHC.
- Examine the association of co-morbid mental health conditions with quality of life, functioning and seizure control.
- Explored the experiences of mental ill-health in the contexts of the lives of PWE.

Methods

First, a systematic review and meta- analysis (Study 1) was conducted to examine the evidence on the association between co-morbid mental health conditions and quality of life and functioning of PWE in low- and middle-income countries. We searched five main databases from their dates of inception to January 2022. Cohen's d was calculated from the mean difference in quality-of-life score between people with epilepsy who did and did not have a co-morbid depression or anxiety condition.

Second, a prospective cohort of people with epilepsy was carried out in four districts of south-central Ethiopia. PWE were ascertained in the community, refererred and recruited at the PHC facility after diagnostic confirmation of convulsive seizures. Co-morbid common mental disorder (CMD) symptoms (depression, anxiety and somatic symptoms) and risky

substance use (exposures) were measured using the culturally validated Self Report Questionnaire (SRQ-20) and Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), respectively. Clinician-diagnosed co-morbid mental disorders were measured using a standardised, semi-structured clinical interview (Operational Criteria for Research; OPCRIT+) administered by mental health professionals. The main outcome, quality of life (QoL) was measured at baseline and 6 months using the Quality of Life in Epilepsy questionnaire (QOLIE-10P). Functional disability was measured using the 12-item World Health Organization Disability Assessment Schedule (WHODAS-2). Seizure frequency was measured at baseline and during the follow-up period (6 months).

Study 2: The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of PHC worker diagnosis against the reference standard clinical diagnosis was calculated. Logistic regression was used to examine the factors associated with misdiagnosis of clinically diagnosed co-morbid mental disorder by PHC workers.

Study 3: Univariate analysis followed by multiple linear regression modelling was used to cross-sectionally examine the association between clinically diagnosed co-morbid mental disorder (primary exposure) and quality of life, adjusting for potential confounding factors identified a priori.

Study 4: Multivariable linear regression was employed to evaluate whether co-morbid CMD symptoms predicted a change in QoL and functional disability after adjusting for baseline levels and pre-defined potential confounders. Structural equation modelling (SEM) was employed to examine direct and indirect pathways linking co-morbid CMD symptoms with QoL or functional disability.

Study 5: A qualitative study using a phenomenological approach was employed, comprising in-depth individual interviews with PWE. Thematic analysis was used, supported by OpenCode software.

Results

Study 1: The search strategy identified a total of 2,101 articles, from which 33 full text articles were included in the review. A large standardized mean effect size (ES) in quality of life score was found (pooled effect size (ES) -1.16, 95% confidence interval (CI) -1.70, -0.63) between those participants with co-morbid depression compared to non-depressed participants (meta-analysis of 19 studies). There was significant heterogeneity between studies (I^2= 97.6%, p<0.001). The median ES (IQR) was -1.20 (-1.40, (-0.64)). An intermediate standard effect size for anxiety on quality of life was also observed (pooled ES -0.64, 95% CI -1.14, -0.13). There was only one study reporting on functioning in relation to co-morbid mental health conditions.

Study 2: The prevalence of clinically diagnosed co-morbid mental disorders was 13.9% (95% CI 9.6%, 18.2%). PHC workers identified 6.3% of clinic attendees as having a mental health condition (95%CI 3.2%, 9.4%). The sensitivity and specificity of PHC worker diagnosis against the clinical standardised reference diagnosis were 21.1% and 96.1%, respectively. Against the reference diagnosis, the optimum cut-off for SRQ-20 (CMD symptom scale) was 9 or above, which identified 41.5% of attendees as 'probable CMD', 95% CI 35.2%, 47.8%. In those diagnosed with co-morbid mental disorders by PHC workers, only 6 (40%) had SRQ-20 score of 9 or above. When a combination of both diagnostic methods (SRQ-20 score ≥9 and PHC diagnosis of depression) was compared with the standardised reference diagnosis of depression, sensitivity increased to 78.9% (95% (CI) 73.4, 84.4%) with specificity of 59.7% (95% CI 53.2, 66.2%). Only older age was significantly associated with misdiagnosis of co-morbid mental disorders by PHC (adjusted odds ratio, 95% CI= 1.06, 1.02 to 1.11).

Study 3 - Comorbid mental disorders were associated with poorer quality of life (Adjusted (Adj.) β -13.27; 95% CI -23.28, -3.26) and greater disability (multiplier of WHODAS-2 score 1.62; 95% CI 1.05, 2.50) after adjusting for hypothesised confounding factors. Low or very low relative wealth (Adj. β -12.57, 95% CI -19.94, -5.20), higher seizure frequency (Adj.β

coef. -1.92, 95% CI -2.83, -1.02), and poor to intermediate social support (Adj. β coef. -9.66, 95% CI -16.51, -2.81) were associated independently with decreased quality of life. Higher seizure frequency (multiplier of WHODAS-2 score 1.11; 95% CI 1.04, 1.19) was associated independently with functional disability.

Study 4: In the multivariable regression model, neither CMD symptoms (β coef= -0.37, 95%CI -1.30, +0.55) nor moderate to high risk of alcohol use (β= -0.70, 95% CI -9.20, +7.81) were significantly associated with change in QoL, and there was no effect modification by treatment engagement. Frequent seizures were associated with a negative change in QoL. In SEM, QoL at 6 months was significantly predicted by seizure frequency. The summative effect of CMD on QoL was significant (B= -0.27, 95%CI -0.48, -0.056), although direct and indirect associations were non-significant. Change in functional disability was not associated with baseline CMD symptoms (β coef.= -0.03, 95% CI-0.48,+0.54) or with moderate to high risk of alcohol use (β coef.= -1.31, 95% CI -5.89, 3.26) and there was no evidence of effect modification by treatment engagement. However, in the SEM model, functional disability at 6 months was predicted by both baseline CMD symptoms (B=0.24, 95% CI 0.06, 0.41) and seizure frequency (B=0.67, 95% CI 0.46, 0.87) independently.

Study 5: Twenty-two PWE were interviewed (8 women, 14 men). The following themes were identified: expression of ill-health; the essence of emotions; the emotional burden of epilepsy and aspirations and mitigating impacts. Participants reported multiple bodily (e.g. fatigue) and emotional (e.g. irritability, sadness) experiences which were tied up with their experience of epilepsy and not separable into physical vs. mental health. Emotions were considered inherently concerning, with emotional imbalance spoken of as a cause or trigger for seizures. These emotional burdens resulted in difficulties fulfilling occupational and social life obligations, in turn exacerbating the stigma-related experienced from others.

Conclusion

In this rural Ethiopian setting, comorbid mental disorders were associated with functional imairemnt and poor quality of life of people with epilepsy. Co-morbid CMD symptoms and

seizure frequency in PWE independently predicted functional disability. The association between CMD symptoms and quality of life was less conclusive. Routine detection of co-morbid mental disorder by PHC workers was very low. Combining clinical judgement with use of a screening scale holds promise but needs further evaluation.

People living with epilepsy in this rural Ethiopian setting experience various emotional, financial, occupational and interpersonal problems which are crucially interwoven with one another and with the experience of epilepsy. A people-centred approach to supporting recovery of PWE requires consideration of mental health alongside physical health, as well as interventions outside the health system to address poverty and stigma.

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Epilepsy is a chronic neurological condition with high comorbidity of mental and physical conditions (1, 2). The International League Against Epilepsy (ILAE) defines epilepsy as a disease of the brain defined by any of the following conditions: (a) at least two unprovoked (or reflex) seizures occurring >24 hours apart; (b) one unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years; (c) diagnosis of an epilepsy syndrome (3). The term “unprovoked” implies a seizure not caused by a transient or reversible factor which lowers the seizure threshold, for example, a seizure related with fever or alcohol withdrawal (3). The risk of recurrence for the majority of individual cases is not known. Even though this definition of epilepsy is clear for clinical diagnosis in primary health care, the assessment of risk of recurrence and the diagnosis of epilepsy syndrome (condition c) might need special interpretive skill and diagnostic investigation.

In the intervention guideline for the World Health Organization Mental Health Gap Action Programme (mhGAP), the definition of convulsive epilepsy has incorporated the first definition stated by ILAE (4). . The simplicity of this definition and the lack of requirement for sophisticated diagnostic tools greatly facilitates the detection of convulsive epilepsy by those who work at the primary health care level.

Globally, the lifetime prevalence of epilepsy is estimated to be 0.76%, with a higher prevalence seen in LAMICs (0.88%) (5, 6). In rural Ethiopia the prevalence of epilepsy was estimated to be 0.52% from a large community based survey (7). The global age standardized mortality and disability adjusted life in years (DALYs) of epilepsy was estimated to be 1.74 (95% uncertainity intervals 1.64 -1.87) and 182.6 (95% uncertainity intervals 149.0 -223.5) per 100,000 population, respectively (8).

High quality evidence from high- and middle-income countries indicates high levels of co-morbid mental health conditions, especially depression and anxiety disorders, among people with epilepsy (PWE) compared to the general population (9, 10). The prevalence of the commonly occurring mental health conditions (depression, anxiety disorders, suicidal and behavioural disorders) ranges from 20-60%, with depression alone accounting for 20-34% of life time prevalence of co-morbid disorder (9-11). In addition, in a systematic review it was found that between 5 and 14.3% of PWE will attempt or complete suicide (12). In sub-Saharan Africa, a systematic review of health facility-based studies found the prevalence of co-morbid depression in people with epilepsy to range from 6.5- 49.3% (13). From the limited research available on the prevalence of co-morbid substance use disorders in PWE, the pooled prevalence of comorbid alcohol abuse (meta-analysis of seven studies) was 5.6% and drug abuse was 6.1% (14).

Co-morbid mental health conditions in PWE have been associated with poorer treatment outcomes, higher stigma, increased disability and poor quality of life in studies carried out in high income country settings (9, 15, 16). Co-morbid mental health conditions have been also shown to affect the course and the management of epilepsy (15). In PWE who had a history of mood and anxiety disorders before the onset of epilepsy, there is a an association with treatment resistance epilepsy (17). Presence of lifetime history of co-morbid mental health conditions has also been shown to be presurgical predictor of failure in surgical management of epilepsy (18). Therefore, routine screening, evaluation and comprehensive management of co-morbid mental health conditions in PWE is highly recommended in high-income country settings (15, 19).

Integrating mental health care into general health care services is promoted as an efficient and effective way to improve both mental and physical health outcomes (4). Such a strategy is especially pertinent with respect to services for people with non-communicable diseases (NCDs), including epilepsy, which mandate an holistic and multidisciplinary approach. The World Health Organization has recently developed evidence-based packages of care for priority mental, neurological (including epilepsy) and substance use disorders to be delivered by primary care workers in low and middle income countries (LAMICs): the WHO Mental Health Gap Action Programme (mhGAP) (4).

This service model has been adopted by the Ethiopian Federal Ministry of Health (20) and is being scaled up (21). Evidence for the best approaches to implementing this model of care have been developed and implemented (21, 22). However, only 26% of the health facilities in Ethiopia have integrated mhGAP-based care for people with mental, neurological and substance use (MNS) disorders into their general services and there is limited data on the quality of the integrated services being provided (21).

The Program for Improving Mental Healthcare (PRIME) was one of the projects that aimed to generate evidence to support the scale up of care for people with MNS disorders, including those with epilepsy (23). Even though improving access to care, detection and management of epilepsy is included with the main objectives of this programme, long-term and sustainable impact on quality of life or seizure control of PWE can only be achieved with integrated and comprehensive management of this neuropsychiatric disorder alongside proactive care for co-morbid mental health conditions.

As integrated people-centered care and universal mental health care are still seen as the cornerstone of scaling up access to quality mental health services, investigation of factors related to the recognition of common mental health conditions by PHC providers will be a pivotal step. Understanding how mental ill-health is experienced and responded to within the context of living with epilepsy is essential for a more people-centred approach to care. Such an understanding will have important implications for the way that interventions are designed to improve recognition of, and responses to, co-morbidity and to achieve outcomes that are valued by individuals with epilepsy.

1.2 Statement of the problem

Despite the substantial impact of mental health co-morbidities on the lives of individuals with epilepsy, there is very limited evidence regarding the detection and impact of co-morbid mental conditions in PWE from low income country settings (24-27). Given the low levels of treatment access for PWE in countries like Ethiopia, as well as high levels of stigma and lack of welfare support, the levels of co-morbid mental health conditions may well be even higher than those seen in better resourced settings and associated with more adverse impacts. Furthermore, despite the large body of quantitative evidence enumerating the various psychosocial problems related to epilepsy and mental ill-health, there has been minimal qualitative research in LMICs to explore how their interconnections and impacts are experienced by individuals within the contexts of their lives (28).

There is also low awareness, poor detection and inadequate treatment of co-morbid mental health conditions in PWE, especially in LAMICs (29, 30). Low detection of common mental health conditions, like depression, in PWE is a problem even in

high-income countries (29, 31), leading to recommendations that PWE require a comprehensive neuropsychiatric assessment. But the situation in low income country settings like rural Ethiopia has not been researched and there is no clear evidence to support implementation of the above recommendations (for example, by focusing on increasing the clinical skill of the clinicians or use of screening instruments). In a study carried out in general out-patient attendees at primary care facilities in Ethiopia, the detection of depression was less than 5% (32). Some of the challenges faced in the diagnosis of co-morbid mental health conditons in PWE include the lack of tangible physical symptoms, reluctance of the affected individual to access care because of the perceived stigma, the difficulty for providers to differentiate between seizure-related psychiatric phenomena from inter-ictal disease, underestimation of symptoms and severity and lack of local specialists (1, 12, 33).

While care is being given successfully by the PRIME project for people with psychosis and epilepsy at the pilot implementation district (Sodo) and is being scaled up across the Gurage zone, poor detection of depression in primary care, including co-morbid depression, has been shown to be a major challenge (32). Missed identification of common mental health conditions, especially depression, in high risk populations, such as those with epilepsy, will lead to incomplete treatment which results in poorer outcomes in the overall life of the affected individuals.

1.3 Rationale for the study

Most studies of co-morbid mental health conditions in PWE in LMICs have been carried out in specialist centres and relied on self-report questionnaires to determine presence of mental health problems. This was the first study to assess the prevalence of clinically confirmed co-morbidity of mental health conditions in people

with epilepsy in a non-specialist setting from a low-income country, Ethiopia. Given the challenges with accurate estimation of prevalence using self-report screening scales, use of clinician diagnoses of mental disorders was an important contribution to identifying the extent of the problem. In order to scale-up models of integrated mental health care in primary care settings, there is also a need to evaluate the current level of detection of co-morbid mental conditions in PWE by PHC clinicians, as well as associated factors. Robust evidence on the impact of co-morbid mental health conditions on disability, seizure control and quality of life is needed to advocate for greater priority to be given to integrated mental health care. As most studies to date have been cross-sectional and unable to examine temporal relationships, a prospective community-based study will make an important contribution to the evidence. In this research study, factors associated with poor seizure control was assessed to inform necessary service improvements during the scale-up process.

The findings from this research will help to inform development of methods to increase the detection (point of care diagnostics) and management of comorbid mental conditions by PHCs integrated with optimal management of epilepsy. Earlier detection and management of comorbid mental conditions has potential to improve epilepsy treatment outcome and improve the quality of life of people with epilepsy.

1.4 Significance of the studies

The significance of these studies will be seen at different levels of mental health care delivery (at the community level, health services and mental health care system) and will provide important evidence to improve the care of PWE. Some of the expected contributions of these studies are:

1. Identification of the obstacles leading to poor detection of co-morbid mental health conditions in PWE.
2. Greater understanding of the impacts of co-morbid mental conditions in PWE.
3. Informing the development of interventions for increasing the detection of co-morbid mental health conditions and ultimately improving the quality of life and daily functioning of PWE.
4. Giving due emphasis to the need for holistic, people-centered and integrated management of PWE which will have a significant contribution in the improvement of the quality of the health service.
5. Informing plans for future training programs of PHC workers on mental health care.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

Globally there have been several reviews of the prevalence of co-morbid mental health conditions in people with epilepsy.

In a recently published systematic review which included 107 studies from 102 countries (7 from low-income and 21 from lower middle-income countries) of the world, anxiety disorders were the most prevalent co-morbid mental health conditions in PWE (34). The pooled prevalence of anxiety disorders and depression in adult PWE was 21.7% (95% CI 19.2-24.3%) and 18.9% (95% CI 15.5- 22.3%), respectively (34). Overall, the review findings indicate that the prevalence of co-morbid mental health conditions in PWE did not significantly differ by the income status of countries. Strength of the review was that it was comprehensive, including studies from all over the world. However, this review pooled together widely heterogeneous studies for meta- analysis (reflected by the high value of I^2), with differences in terms of setting and methodology of diagnosing co-morbid mental health conditions. The authors concluded that most studies had low to moderate risk of bias but the details of quality assessment of included studies was not clear.

In another more recently published systematic review on suicidal ideation, attempts and death in people with epilepsy, wide variability in the methodological quality of the studies was noted (35). The pooled prevalence of death due to suicide was 0.5% (95%CI 0.2, 1.6%) (35). The pooled prevalence of suicide attempts (18 studies) and ideation (24 studies) were 7.4% (95% CI, 3.1, 16.9%) and 23.2% (95% CI:17.6–

30.1%), respectively. From 7 case–control studies the pooled odds of suicide attempt was three times increased when compared to controls (pooled OR = 3.25, 95% CI: 2.69–3.92). Although this systematic review and meta- analysis included 53 articles, more than 80% of the included studies were cross-sectional. From the 7 case- control studies only one study was from LAMICs. Only three articles included in the meta-analysis were from sub-Saharan Africa. This systematic review was further limited by only reviewing English language articles, which meant that they could have missed some of the locally published data from low-income country settings. Methodologically heterogeneous studies were included in the meta-analysis and the quality assessment of the included studies was not rigorous. The authors concluded that the prevalence of suicidality in PWE is higher than the general population.

All these systematic reviews documented the limitation that most of the included studies were conducted in high income countries and at hospital level.

In this literature review, existing studies conducted in the area of epilepsy and co-morbid mental health conditions in LAMICs was synthesised and critiqued, with special emphasis on studies from sub-Saharan Africa. The objectives of the litrature review were:

1. To identify the best evidence on prevalence of co-morbid mental health conditions among PWE in sub-Saharan Africa.
2. To examine the knowledge gap in evaluating the impact of co-morbid mental health conditions on people with epilepsy in sub-Saharan Africa.
3. To examine the methods of detection of co-morbid mental health conditions in PWE in LAMICs.

4. To investigate validated screening tools to detect common mental disorders (CMD) among PWE, with particular emphasis on evidence from LAMICs.

2.2 Methods of literature review

2.2.1 Criteria for selecting the studies

Population /Types of participants

- Epilepsy (any type): The diagnosis should have been made by a clinician or uing a standardized diagnostic measure (like Electro-Encephalogram EEG) based on the International League Against Epilepsy (ILEA) definition of epilepsy.
- Co-morbid mental health condition: A diagnosis of a co-morbid mental disorder as part of routine clinical evaluation or use of a screening instrument or structured criteria of diagnosis by any clinician. The types of mental health conditions under consideration were as follows: mood disorders, anxiety disorders, somatic symptom disorders and psychotic disorders. The following mental health conditions were excluded: personality disorders, cognitive disorders, dissociative disorders, sexual disorders and childhood onset psychiatric disorders e.g. Attention deficit hyperactivity disorder (ADHD).
- Participants aged 18 years and above.
- Carried out in a low- or middle-income country as defined by World Bank criteria.

Exclusion criteria

- Studies conducted in humanitarian settings
- Studies on participants with co-morbid neurodevelopmental disorders

- Special subpopulations and high-risk groups e.g. HIV positive only, substance users, or people with a specific neurological lesion or sensory deficit (e.g. hippocampal sclerosis)
- Functional neurologic symptom disorder or non-epileptic attacks.
- Editorials, expert opinion and case reports

2.2.2 Outcomes and types of study design

1. **Prevalence of comorbid mental health conditions among PWE**

- Any reports on the prevalence of mental disorders in PWE.

2. **Impacts of comorbid mental health conditions**

Primary outcome:

- Quality of life measured using standardized, quantitative measurement.

Secondary outcomes

- Seizure frequency: any reports on seizure numbers
- Functional disability: the assessment of functioning or disability using a standardized quantitative measurement

3. **Detection of comorbid mental mental conditions in PWE**
   - Any detection methods for comorbidity of mental disorders in PWE.
4. **Validated CMD screening tools**
   - Reports on the psychometric properties or diagnostic accuracy (criterion validity) of any CMD screening tools relative to any gold standard measure of CMD.

Types of study design and setting

- For objectives 1, 2 and 3, cross-sectional, cohort or case control study designs or randomized control trials were included. For objective 4, validation

and adaptation studies and systematic reviews of screening tools were included. The setting is sub-Saharan Africa for objectives 1and 2 and LAMICs for objective 3 and 4.

2.2.3 Search methods for identification of the studies

Electronic searches

This was done using an online search of the following electronic databases: PubMed, Embase, Global Index medicus (GIM) and Psycinfo from inception till March, 2019 and an update was done up to March 2023. The following key terms were used: epilepsy, mental disorders/ illness/ health/ distress, quality of life, functioning/disability, seizure control, treatment engagement /adherence, psychometric, validation/adaptation, both in combination and separately. The search was limited to English language. The search strategy for PubMed is included as Appendix A.

2.2.4 Data collection and analysis

Selection of studies

The selection of eligible studies was done by the principal investigator. All the searched studies were compiled using reference management software and duplicates were removed. Then, the titles and abstracts were screened and irrelevant studies and reports were removed. Then potentially relevant full articles were retrieved and multiple reports of the same study were identified and linked together. The next step was to examine the eligibility of full-text studies. The eligibility criteria were based on the above specified criteria. If there was any ambiguity in the screening process, another investigator was involved to check the selection process. Final decisions on the search terms and inclusion of the relevant

studies were made and all the steps taken were recorded to draw a PRISMA flow diagram.

2.2.5 Data extraction and management

A standard data extraction tool was prepared by adapting the already available data extraction tools. Then relevant data from the included full articles were extracted and consensus made on the contents of the extracted data. The same kind of information from multiple articles but from the same source was combined. Tables were developed for the included studies, with author and year, country, methods (study population, setting and some other important information: method, number of participants, screening tool type, outcomes and risk of bias). The final result was presented as a narrative synthesis.

2.2.6 Assessment of quality of the included studies

Evaluation of the validity and risk of bias of the included studies was conducted. The Newcastle–Ottawa Scale (NOS) was planned to be used to appraise the quality of cohort and case control studies (36), the Hoy et al. quality assessment tool for prevalence studies (37) and the COSMIN criteria and Greenhalgh's ten item checklist for quality assessment of psychometric studies (38, 39).

2.2.7 Assessment of heterogeneity

Heterogeneity was examined by comparing the important participant clinical characteristics between studies (duration and types of epilepsy, setting for recruitment of participants (primary, tertiary care), the type of comorbid mental disorder screening tool, the type of the gold standard tool, and differences in the interviewer profession).

2.3 Results of the literature review

2.3.1 Prevalence of comorbid mental health conditions in people with epilepsy in sub-Saharan Africa

A total of 1649 articles were retrieved from the four databases (PubMed=979, EMBASE= 335, PsycINFO= 130, GIM= 265) after the duplicates (n=60) were removed. After title and abstract screening, there were 27 articles found to be reporting on the prevalence of co-morbid mental disorders. Three articles were excluded since the full articles could not be retrieved and one article had a duplicate finding. Finally two reviews and 21 original research articles were reviewed (see figure 1). A summary of the included articles is seen in table 1.

The first review was carried out by Akinsulore et al (40) nine years ago and was restricted to studies conducted in Nigeria. In that review, there was a high overall prevalence of co-morbid psychiatric disorders in adults PWE (37.3%). But the review was not done systematically and only included one database. There were no clear criteria for eligibility of the studies and the methods for quality assessment were not properly elaborated.

The other review was published recently and conducted systematically, with an associated meta-analysis (41) on the prevalence of depression in PWE in sub–Saharan African countries. A total of sixteen studies were included in the meta-analysis. Of these, 14 had a cross-sectional study design and two (12%) were case-control studies. The pooled prevalence of depression in PWE was 32.7% (95% CI 25.5- 39.9), ranging from 6.5 - 49.3%. Sub-group analysis by geographic regions found the pooled prevalence of depression in East Africa to be 34.5% (95%CI=23.5, 45.5) and in Southern and West Africa to be 29.7% (95% CI= 22.7, 34.5%). This

review had clear objectives and tried to be comprehensive in the search of relevant databases, including unpublished theses. The review had clear eligibility criteria, quality and risk of bias assessment methods. The data management plan and execution was well stated. The selection of the studies was done by two independent authors and the list of the relevant items extracted from the individual studies was stated. However, the tools used for data extraction were not clear. Publication bias was also assessed and a trim and fill method of analysis was used to mitigate the problem of publication bias. The reviewers used the PRISMA flow chart and describe the methods of meta-analysis, including the planned sensitivity and subgroup analyses. All the included studies recruited their participants from a hospital setting (in-patient and/or out-patient).

The main limitations of this systematic review were as follows: It did not consider the influence of the setting of the study area on the outcome of interest. Most of the included studies were carried out in tertiary hospitals which tend to serve people with more severe forms of epilepsy. The presence of co-morbid mental disorder may also increase help seeking and will over-estimate the extent of co-morbidity in the studied population. All these are sources of selection bias which influence the representativeness of the sample. Heterogeneity was assessed using I^2 test. However, even though the authors acknowledged the heterogeneity of the included studies, they combined findings from studies with different study designs (case-control and cross-sectional studies) and differing assessment questionnaires for meta-analysis. Three-quarters of the included studies used screening tools for depression, including the Beck Depression Inventory (BDI) and Hospital Anxiety and Depression Scale (HADS). One quarter used a structured interview scale like Mini International Neuropsychiatric interview (MINI). There was no information provided

about the validity of the assessment tools used in the included studies. The meta-analysis also included two studies that were carried out in the same population (double-reporting) (42-45) which would have overestimated the prevalence. They also mixed adolescents with adults, but adolescents are likely to differ in terms of the way that common mental disorders present and their risk factors for mental disorder.

The search strategy for this PhD thesis identified 11 additional studies that were not included by this systematic review (Dessie et al, 2019). See Figure 2.

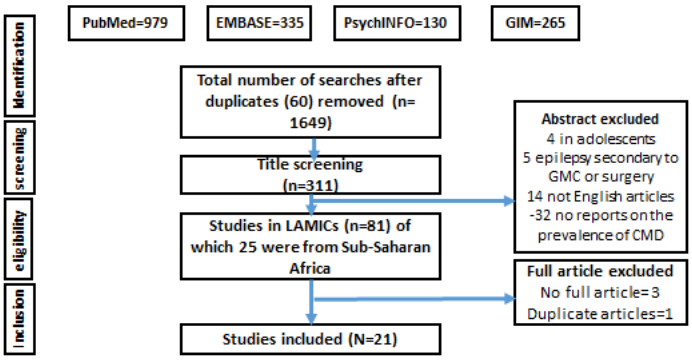

Figure 1: PRISMA flow diagram for the prevalence of co-morbid mental health conditions in PWE in sub-Saharan Africa

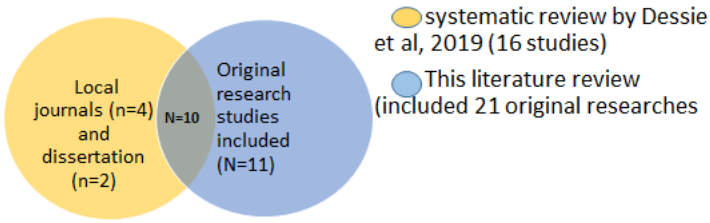

Figure 2 the numbers of original researches include in a systematic review by Dessie et al, 2019 and this literature review

Table 1: Summary of the articles on prevalence of co-morbid mental disorders in PWE in sub-Saharan Africa

Author's name, year of publication	Country	Setting	Types of epilepsy	Sample size	Diagnostic tools used for CMD with cut off score	Prevalence of CMD	Quality assessment (Hoy et al) 0-3 low risk, 4-6 moderate, 7-9 high risk
Addis et al, 2021	Ethiopia	Tertiary hospital	-	307	HADS (validated)	MDD- 37% (95% CI: 32.23–42.09)	
Ayanda et al., 2016	Nigeria	Tertiary hospital	-	74	MINI (not validated)	Overall 44.6% MDD: 21.6%; Schizophrenia: 17.6%; GAD: 4.1%; Hypomania -1.4%	
Biffetu et al., 2015	Ethiopia	Hospital based (tertiary OPD	-	405	≥ 10 BDI (not validated)	Depression 45.2%	
Chaka et al, 2018	Ethiopia	Hospital based OPD	Grandma= 251 Petitmal =108 Other=63	422	≥ 5 PHQ-9 (validated)	Depression 43.8% Current alcohol drinking 18.7% Khat chewing 10%	
Engidaw et al 2020	Ethiopia	tertiary	-	402	BDI-II (not validated)	MDD- 48.1%	
Gureje et al,	Nigeria	Tertiary	Generalize	204	≥13 CIS (only face	Neurosis 19.6%	

1991		hospital	d=99 TLE=82 Partial =23		validity was done	Psychosis 10.8% Personality disorders 6.9%										
Haile et al, 2018	Ethiopia	Hospital based (tertiary)	-	410	≥5 PHQ-9 CIDI Chart review	Suicidal idea-29.8% Suicidal attempt- 14.1% Depression 28.3%										
M'Bayo et al, 2017	Seirra Leon	Hospital based (urban and rural	-	142	Local tool similar with the Zambia study (Mbewe et al)	Depression and anxiety-27.5%										
Mbewe et al, 2013	Zambia	Primary health care	-	120	≥18 Locally developed & validated tool	49.2% had depression and anxiety										
Mosaku et al 2006	Nigeria	Tertiary Hospital	Generalised=21 Focal=30	51	≥ 8 HADS GHQ-30 (both are validated	Depression 27.5% Anxiety 31.4%										
Nubukpo et al, 2004	Togo and Benin	Community based	-	281 in Togo & 215 in Benin=496	≥5 for anxiety & ≥ 2 for depression GADS not validated	In Togo, Anxiety 66.9% & Depression 84% In Benin anxiety 84.1% & depression 85.3%										
Nuhu et al,2013	Nigeria	Tertiary Hospital	Generalised=148 Focal =17 Unclassifie	170	≥10 MINI (not validated ≥8 HADS (validated)	Depression 17.1% Anxiety 21.2% Suicide risk 20%										

			d=5												
Onwuekwe et al, 2012	Nigeria	Tertiary hospital based	-	83	≥14 BDI (not validated)	Mild–moderate depression 16.8%									
Owolabi et al, 2016	Nigeria	Tertiary hospital r & from health centre	Generalized =205 Partial=50	255	≥5 MINI (not validated)	Dysthymia 11.4% Depression 3.9%									
Seid and Mebrahatu, 2022	Ethiopia	Tertiary	-	296	PHQ-9 (validated)	Depression= 34.8% Suicidal wish= 16.3%, suicidal attempt= 3.7%									
Seid et al, 2022	Ethiopia	Tertiary	-	300 (aged >12years	GAD-7 (not known)	Anxiety disorder symptoms=38.3% Suicidal wish= 19.6%									
Sylla et al, 2020	Republic of Guinea	Tertiary hospital	Tonic-clonic moveents= 114	140	≥ 5 PHQ-9	Depression= 66%(95% CI: 58%–74%									
Tegegne et al, 2015	Ethiopia	Hospital based tertiary	-	423	≥8 HADS validated	Anxiety 33.5% Depression – 32.8%									
Tsegabrhan et al, 2014	Ethiopia	Hospital based	GTC=213	300	≥14 BDI not validated	Depression 49.3%									
Tsigebrhan	Ethiopia	Community	GTC=277	298	≥5 & ≥ 10 PHQ-9,	Suicidality 30.2%									

et al. ,2017		based recruitment at primary HC level	Focal= 21		CIDI (validated) ≥8 AUDIT	Moderate–severe depression 34.9% Alcohol use disorder 27.2%									
Tunde-Ayinmode et al, 2014	Nigeria	Tertiary Hospital based	Generalised=46 Focal=8 Unclassified=9	63	≥3 on GHQ-12 and SCAN (validated)	Overall 28.6% Depression 19% Anxiety 3.1% Psychosis 3.1%									

MINI- mini international neuropsychiatric interview, CIS- clinical interview schedule, GADS- Goldberg's Anxiety and depression scale, PHQ-Patient Health Questionnaire, HADS- Hospital Anxiety and Depression scale, SCAN- Schedule for Clinical Assessment for Neuropsychiatry, CIDI- Composite International Diagnostic Interview, AUDIT- Alcohol Use Disorder Identification Test, GHQ- General Health Questionnaire, BDI- Beck Depression Inventory

All the original research studies used a cross-sectional study design. Most of them (10/21 studies) were from Ethiopia, followed by Nigeria (7/21 studies) and one each from Benin, Sierra Leone, Republic of Guinea and Zambia. All participants were recruited from tertiary hospitals except for three studies that recruited participants from the community (24, 46, 47). Most studies included participants older than 18 years, but four studies included adolescents (48-51). The sample size ranged from 51–496 participants. The types of seizure were only specified in eight studies.

The most commonly used tools for the diagnosis of co-morbid mental health condition were the Patient health Questionaire (PHQ-9), the Beck Depression Inventory (BDI), the Hospital Anxiety and Depression Scale (HADS) and the Mini International Neuropsychiatric Interview (MINI). Two articles used a locally developed and validated tool for screening of people with depression and anxiety (46, 52).

Depression and anxiety were the most commonly investigated co-morbid mental health condtions in PWE. The prevalence of depression ranged from 3.9-66% in hospital-based studies (16 studies; n=3943 participants) and from 34.9-85.3% in the community and/or primary health care-based studies (3 studies; n=914 participants). The prevalence of depression using PHQ-9 ranged from 28.3-66% (5 studies; n=1566 participants). The prevalence of anxiety symptoms ranged from 3.1-84.1% (10 studies, n=2043 participants). The prevalence of co-morbid psychosis ranged from 3.1- 17.6% (3 studies; n=341 participants). The prevalence of suicidal ideation ranged from 16.3 - 30.2% (5 studies; n=1474 participants). The prevalence of substance use disorder was reported by four studies only and ranged from 10-27.8% (total n=1316 participants).

Most of the participants were recruited from a tertiary hospital which again causes selection bias because the sample is not representative of the general population of PWE. The sampling frame for the target population and the selection of the participants was not clearly stated in 11 out of 21 of the included studies. The percentage of people who had non-response was reported in only six of the included studies (42, 47, 53-55). One of the included studies used two methods for interviewing participants (for literate and illiterate participants) using the same instrument (52). These have caused social desirability bias and may have underestimated the prevalence. The wide range in the prevalence of depression or anxiety disorder could be due to the instrument used to measure the co-morbid mental disorder, the type of seizure disorder or importantly the setting of participant recruitment.

Mosaku et al (56) excluded participants who were not able to afford to pay for EEG and this would have caused selection bias. The authors of this study did not consider the ethical implications of using this kind of exclusion criteria in terms of the ethical principle of justice; that evidence should be collected equitably for the populations in need. Four of the reviewed studies had a sample size of less than 100, and the sample sizes were taken conveniently without proper estimation of the required number of participants (56-59). Most of the reviewed studies used non validated tools to assess the co-morbidity of mental disorders except a few (46, 47, 52-54, 56, 59) and they used a cut off score from other setting. This might cause over or under estimation of the prevalence of the co-morbid mental disorders. Overall there were a lot of methodological flaws in most of the reviewed studies especially for those done in hospital settings. This means that there is little high-quality evidence on the prevalence of co-morbid mental disorders in PWE in sub-Saharan Africa.

2.3.2 Impacts of co-morbid mental health conditions in people with epilepsy

The search resulted in a total of 1808 articles from the four databases (PubMed=569, EMBASE= 209, PsychINFO=24, GIM=1246) after the duplicates (n=240) were removed. On title and abstract screening there were 63 studies found to be relevant. Of these, 15 studies was carried out in sub-Saharan Africa but one was done on the same population (60). One article did not report on the impacts of co-morbid mental disorder on quality of life (61). A PRISMA flow chart is seen on figure 3. From the eleven full text articles reviewed, five were from Ethiopia; five were from Nigeria, and one from Kenya. All of the studies used a cross-sectional study design and the setting was from tertiary hospitals except in one study (62). The sample size ranged from 51 to 439 participants and included ages greater than 18 years. Quality of life was the most commonly measured impact and three of the articles used a validated measurement of quality of life in their specific population (62-64). Depression, followed by anxiety, was the most investigated co-morbid mental disorder, followed by anxiety disorder. All the studies found a significant association between depression and poor quality of life (QOL) in people with epilepsy. A summary of the included studies is shown in table 2.

When the quality of the retrieved papers was evaluated, one study recruited participants from the community that was representative of the general population (62). This study also clearly stated the method for sample size calculation and participant selection. The instruments used for the assessment of the desired variables and the methods of data collection were also rigorously written. But one of the limitations of this study was that it used a sample size calculated to test the use of an instrument and not to investigate the association of comorbid mental disorders

with QOL. The small sample size was also reflected by the wide confidence interval (CI) in the association of depression and QOL.

Olley et al. (65) is the only study which assessed the association between depression and “neurotic” symptoms with poor seizure control. The inclusion and the exclusion criteria of the participants were clearly stated and the measures were selected after adapting them to the local context. But the objective of the study was not consistent with the end result; the sample size was also calculated for another research and was selected from the outpatient tertiary hospital which resulted in selection bias. The presentation of the results was not clear and seizure frequency was measured rather than seizure control.

The sampling strategy for all other studies was also not based on the correct parameters. For example, Tegegne et al (45) used a single proportion formula to calculate the sample size rather than the mean difference in QOL score. The other studies also conveniently recruited participants attending the outpatient clinics of tertiary hospitals. This kind of recruitment will not be representative of the target population. There was no sampling frame or sampling strategy represented (60, 63) and non-response was not documented in many of the studies (60, 62, 63). One of the studies even excluded those who were not able to afford diagnostic methods which further exacerbate the selection bias (56).

Overall there was limited evidence regarding the impact of co-morbid mental disorders in PWE in sub-Saharan Africa. A single measure of impact (quality of life) was reported in all of the studies. Based on our search there was no available evidence for the other impact measurements (seizure control or functioning/disability). None of the studies had a longitudinal design, limiting

understanding of the temporal relationship between mental health conditions and quality of life.

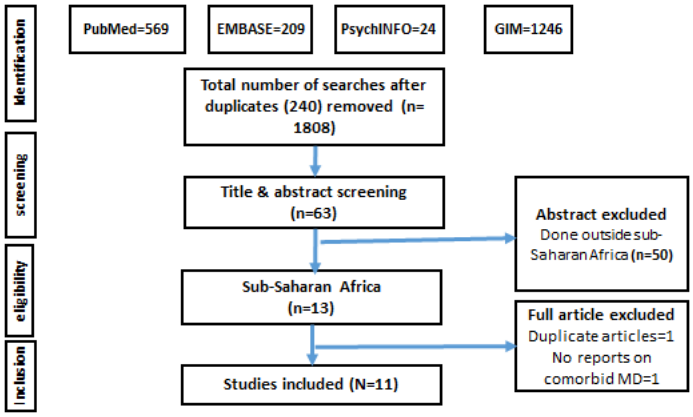

Figure 3: PRISMA flow diagram for the impacts of co-morbid mental health conditions in PWE

2.3.3 Detection of comorbid mental health conditions in PWE in LAMICs

For objective 3, the search result produced a total of 1476 articles from the four databases (PubMed=232, EMBASE= 99, PsycINFO=68, GIM=1090) after 13 duplicates were removed. With screening the title and the abstract, only four studies were found to have been conducted in LAMICs. Two of the studies were conducted in Zambia, one in Malaysia and one in Nigeria.

The recently published article from Malaysia evaluated the prevalence of undiagnosed depression in PWE using two self-administered screening tools (Neurological disorders depression inventory for epilepsy (NDDIE) and BDI-II) then confirmed diagnose using clinical evaluation (66). They used the English versions of NDDIE and BDI-II. For most of participants (61.2%) the Malay version of BDI-II was also used. In total, 14 participants (10.9%) were positive for depressive symptoms based on the NDDI-E alone, 14 (10.9%) participants were positive for depressive symptoms based on BDI-II alone, and 6.2% of the particpants were positive on both NDDI-E and BDI-II. A total of 9.3% were diagnosed with MDD by clinical evaluation;

five from NDDI-E screening and seven from BDI-II screening. The authors concluded that the prevalence of undiagnosed depression was high in PWE and recommended health care personnel to use the widely available screening tools to identify patients with co-morbid depression. This study had a clear objective and the methodology of conducting the study was clear. The only limitation was that the authors did not explicitly discuss the use of screening tools or clinical evaluation for better identification of PWE and co-morbid depression.

In the study from Nigeria, the Hamilton Rating Scale for Depression (HRSD) with Beck Depression Inventory (BDI) were compared with respect to the detection of depressive symptoms in PWE at a tertiary hospital (67). They found that both tools were able to detect depression and anxiety in both cases and controls. In the background there was no rationale provided for using two similar measurement tools to detect depression. The cases were not clearly defined but they were randomly selected from the sampling frame. The controls were selected from the same sampling frame as the cases and matched based on age, sex, occupation and marital status. They clearly described the absence of epilepsy in the controles but no statistical analysis was done to show that there was no difference in socio-demorgaphic characterstics between the controls and the cases. They stated that HRSD was used for depressive symptoms assessment and BDI for self-evaluation but there was nothing in the methods of data collection about the exposure status (depressive symptoms) in both groups (who are the assessors, what language used, the interviewer knowledge on disease status). There were no reports on the percentage of the respondents in both the cases and controls. The routine detection of depression in the clinical setting was not done.Overall this study was poorly planned and executed.

There were two studies from Zambia performed by the same person, the first one evaluated the detection rate of depressive and anxiety disorders at primary health care level by Primary Health Clinicians (PHC)(68) and the second study assessed the impact of using screening instruments for depression and anxiety disorders in PWE in five selected health centres (46) after developing and validating a new local screening tool (69). The initial level of detection was very low (1%) but this increased to 49.2% with use of the newly developed screening tool. Both studies used the same kind of methodology (chart review, data extraction tool and analysis). These two studies recruited participants at the primary health care level and gave a good rationale for this approach. There was a clear definition of epilepsy but no statement about the types of epilepsy.

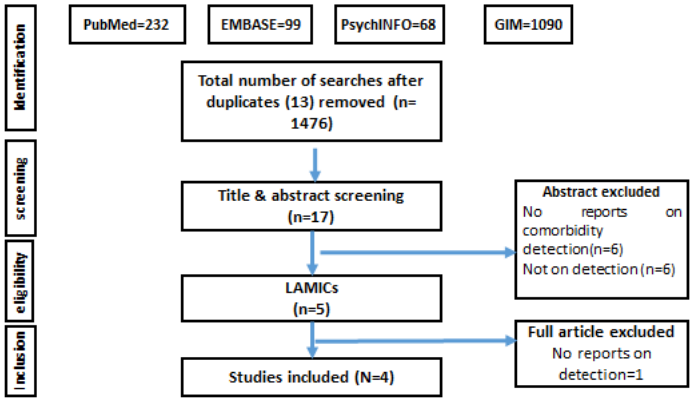

Figure 4: PRISMA flow chart detection of co-morbid mental health conditions in PWE in LAMICs

Table 2. Summary of reviewed articles on the impacts of co-morbid mental disorders in PWE

Author's name, year of publication	**Country**	**Set up**	**Study design**	**Sample size**	**Tools of assessment**	**Result**	**Quality assessment (Hoy et al) 0-3 low risk, 4-6 moderate, 7-9 high risk**
Abadiga M et al, 2019	Ethiopia	Public hospital	Cross-sectional	392	HADS WHOQOL-BREF	Comorbidity of depression and anxiety were negatively associated with QOL	
Addis et al, 2021	Ethiopia	Tertiary hospital	Cross-sectional	370	HADS QOLIE-31	Anxiety was associated with poor QOL	
Adebayo et al, 2014	Nigeria	Tertiary hospital	Cross-sectional comparative	102	BDI QOLIE-31	An association of depression, somatic co-morbidities with lower QOL	
Ayanda et al, 2020	Nigeria	Tertiary hospital	Cross-sectional	74	MINI+ WHOQOL-BREF	Prescence of comorbid mental disorders were associated with poor QOL	
Kassie et al, 2021	Ethiopia	Primary and tertiary hospital	Cross-sectional	395	PHQ-4 QOLIE-31	Depression was associated with poor QOL	

Mesafinit et al, 2020	Ethiopia	Tertiary	Cross-sectional	439	HADS WHOQOL-BREF	QOL score was decreased for those with depression and anxiety									
Mosaku et al, 2006	Nigeria	Tertiary hospital	Cross-sectional	51	HADS GHQ-30 QOLIE_10	High depression and anxiety symptoms with low QOL									
Ogundare et al, 2020	Nigeria	Tertiary hospital	Cross-sectional	270	BDI-II, MINI+ QOLIE-31	Decreased QOL for those with depression									
Olley et al, 2004	Nigeria	Tertiary hospital	Cross-sectional	264	BDI CCEI Seizure control	Poor seizure control is associated with increased depression & neurotic disorder									
Mwangala et al 2018	Kenya	Community base	Cross-sectional comparative	Cases 64 Controls =91	MDI MOS-36	Depression with low QOL									
Tegegne et al, 2014	Ethiopia	Tertiary hospital	Cross-sectional	415	HADS WHOQOL-BREF	Co-morbid anxiety and depression with poor QOL									

BDI- Beck Depression Inventory, QOLIE- Quality Of Life for Epilepsy, HADS- Hospital Anxiety and Depression scale, GHQ- General Health Questionnaire, , WHOQOL-BREF- World Health Organization Quality of Life questionnaire, MDI- Major Depression Inventory, MOS-36 short version of SF-36.
CCEI - the Crown Crisp Experiential Index

Table 3: Summary of reviewed studies on detection of comorbid mental health conditions in PWE in LAMICs

Author's name, year of publication	**Country**	**Set up**	**Study design**	**Sample size**	**Age (years)**	**Types of epilepsy**	**Methods of detecting CMD**	**Result**
Mbewe et al , 2013 1. Detection 2. Impact	Zambia	Primary	Cross-sectional	1. 200 charts 2. 120 charts	≥18	-	1. Chart review 2. newly developed brief screening tool	1. 1% explicit diagnosis of depression & anxiety disorder 2. 35.8% depression 13.3% anxiety disorders
Ogunrin et al, 2010	Nigeria	Tertiary hospital	Case-control study	76 cases and 76 controls	≥ 18	-	HRSD BDI	Prevalence of depressive symptoms was 42.1% using HRSD and was 44.7% using BDI
J.k. Tan et al, 2021	Malasia	Tertiary hospital	Cross-sectional	129	≥18	Generalised (60.5%) Focal	NDDI-E and BDI-II DSM-5 criteria clinical evaluation	10.9% using NDDI-E or BDI-II 9.3% using clinical evalaution

SCID- Structured Clinical Interview for DSM-IV, TLE- temporal lobe Epilepsy, HRSD- Hamilton Rating Scale for Depression, BDI – Beck Depression Inventory, NDDI-E – Neurologic Disorders depression inventory for epilepsy

Even though there was a clear description about the eligibility criteria for charts to be reviewed, the process of selecting the patient's chart was not clearly specified which might cause a selection bias. They should have also specified the role of the PHC workers' willingness to learn or their competency affecting the important outcome. Strengths of these two studies are that they used a locally developed and validated screening tool for detection of depression and anxiety symptoms. This increases the validity and applicability of their result.

2.3.4 Validated tools for screening of common mental disorders (CMD) in PWE in LAMICs

The search strategy led to identification of 851 articles from the four databases (PubMed=119, EMBASE= 188, PsycINFO=134, GIM=410) after 158 duplicates were removed. Title and abstract screening resulted in 41 relevant articles but only 21 of them were carried out in LAMICs. Four articles were excluded (two of the articles were in Portuguese language and the other one was done in a special population of people with epilepsy) (70-72). A total of 17 articles were, therefore, included. The PRISMA flow chart is seen in figure 4.

Most of the reviewed articles were from China (6/17), two from Brazil, one from India, Iran, Vietnam, Georgia, Lithuania, Serbia, Kenya, Zambia and Rwanda. All of them conducted their study in a tertiary hospital except one study from sub-Saharan Africa (69). The sample size ranged from 63- 575 and three of the studies had a sample size of less than 100 (73-75). The most commonly validated tool was the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E), followed by the PHQ-9 (75-77). The most commonly screened mental disorder was depression (74-86). Nine out of the 17 articles used the Mini International Neuropsychiatric Interview (MINI) as a gold standard tool (74, 77, 78, 80-83, 87, 88). All of the studies assessed

criterion validity except two (73, 76). Rather than criterion validity, divergent, construct, concurrent and discriminant validity were performed in those studies (73, 76). NDDIE-E was found to have sensitivity ranging from 72-96.7% and specificity of 74.5-95% in eleven of the included articles (63-67(77, 82-86). A summary of the included articles is presented in table 4.

Mbewe et al. validated a locally developed tool to screen for depression and anxiety at primary health care level (69). The authors explicitly provided the rationale behind the development of the new tool, the process of the development and assessed the conceptual validity of the instrument. The sample size calculation was also clear and the study had a large sample size compared to the other included studies. The recruitment of the participants was from primary health care which was representative of the general population and the selection criteria and procedure was also reported. The procedure for administering both the screening and the gold standard tool was clearly written. In the results section they reported that it is possible to administer a screening tool in a busy primary health clinic with good interrater reliability. But the sensitivity, specificity and the positive predictive value (PPV) of the instrument were all below 70%.

All the other studies adapted a screening tool that was developed in another (Western, high-income country) setting, involving translation of the instrument, back-translation, and assessment of the conceptual validity of the tool, except in two studies (73, 75). There was a clear description of the measurement aim and the target population, with clear eligibility criteria in all the studies. However, there was also likely selection bias in the recruitment of the participants in all except two studies (69, 73). Almost all the studies recruited participants from tertiary health care and did not explicitly describe the selection process (whether it was random

sampling or not). Construct validity was also investigated by only two studies (73, 76).

Two thirds of the studies (11/17) clearly put the methods of administering of the instruments. Some studies did not report on the time interval between administration of the instruments (74) or on the validation status of the gold standard tool (78-80, 87). There were also no reports of whether the people who administered the gold standard were blind to the screening tool.

The majority of studies reported the internal consistency of the validated tools except two studies (75, 80). The reported Cronbach alpha for NDDI-E ranged from 0.70-0.90 which indicated a satisfactory level of internal consistency. But there were no reports on test re-test or inter-rater reliability test in most of the studies.

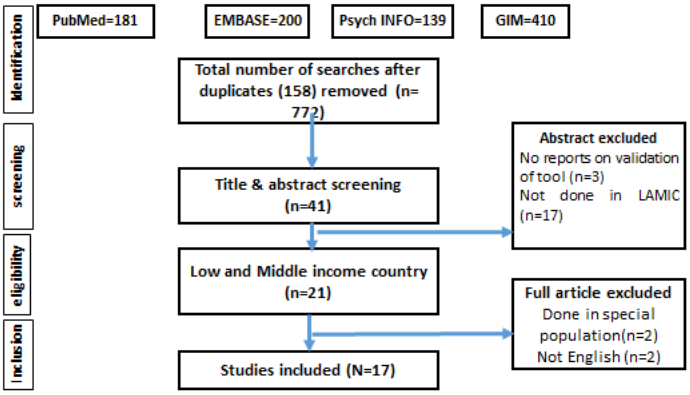

Figure 5 PRISMA flow diagram: validated tools for screening of common mental disorders (CMD) in PWE in LAMICs

Table 4 Summary of the included studies for validated tools for screening of CMD in PWE in LAMICs

Author & year	Country (language)	Set up	Sample size	Screening tool used	Gold standard tool	Cut off	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Quality assessment good, fair acceptable
Chongwo et al, 2018	Kenya (Swahili)	Tertiary hospital	63	WHO-5 wellbeing index versus MDI	-		-	-	-	-	
De Oliveira et al, 2010	Brazil (Portuguese)	Tertiary hospital	98	NDDI-E	MINI-plus HAM-D	>15	81.5	83.1	64.7%	92.2	
De Oliveira et al, 2014	Brazil (Portuguese)	Tertiary hospital	126	NDDI-E HADS-D BDI	MINI-plus	≥15 ≥8 ≥17	82.9 85.7 88.6	79.1 80.2 91.2	60.4 62.5 79.5	92.3 93.6 95.4	
Guo et al, 2015	China (Chines)	Tertiary hospital	248	NDDI-E	MINI- plus and BDI-II	≥14	85	89	62	96	
T. Le Hoang Ngoc. 2021	Vietenam	Tertiary hospital	91	PHQ-9	SCID-5	≥8	87.0	82.4	62.5	94.9	
Mbewe et	Zambia	Primary	575	Locally	Bsc	≥18	56.6	68.1	67.3	57.5	

al, 2013	(Nyanja and Bemba)	health care		developed tool for depression &anxiety	psychiatry nurse clinical assessment											
Puteikis et al, 2022	Lithuania	Tertiary 246	246	NDDI-E	BDI-II	>11	90.0	74.5	34.2	98.1						
Rashid et al,2019	India	Tertiary hospital	217	NDDI-E	MINI-plus	≥11	96.7	84.3	81.3	97.3						
Ristic et al, 2016	Serbia (Serbian)	Tertiary hospital	103	NDDI-E	Semi-structured Clinical evaluation & BDI	≥14	72	95	81.3	94.3						
Sebera et al, 2020	Rwanda	Tertiary hospital	434	PHQ-9	HDRS	>4	72.4	69.6	79.1	61.2						
Y.C.Shih, 2020	China	Tertiary	109	NDDI-E(Taiwanise)	MINI-plus BDI-II	>15	85	87.6	60.7	86.3						
Y.C. Shih, 2022	China	Tertiary	107	GAD-7 (chines)	MINI-plus BDI-II	>7	88.2	78.9	44.1	97.3						
K. Silagadze, 2019	Georgia	Tertiary	130	NDDI-E	Clinical Diagnosis	≥16	90	94	82	97						
Tong et	China	Tertiary	202	NDDI-E	MINI-plus	≥12	92.6	80.4	63.3	96.7						

al,2015	(Chines)	hospital														
Tong et al, 2016	China (Chines)	Tertiary hospital	213	GAD-7	MINI-plus	>6	94	91.4	77	98						
Vaighan etal 2020	Iran (Persian)	Tertiary	210	NDDI-E	BDI-II Clinical diagnosis	≥14	83	80	70.1	88.6						
Xia et al, 2019	China	Tertiary	213	PHQ-9 PHQ-2	MINI-plus	>6 PHQ-9	82.9	84.3	50.9	96.2						

PPV-Positive Predictive value, NPV- Negative predictive value, Neurological Disorders Depression Inventory for Epilepsy (NDDI-E), MDI- Major Depression Inventory, MINI- Mini International Neuropsychiatric Interview, HDRS- Hamilton depression rating scale, HAM-D Hamilton Depression Scale, HADS-D – Hamilton Anxiety Depression Scale Depression subscale, BDI- beck Depression Inventory, GAD-7 Generalized Anxiety Disorder

In conclusion, the prevalence of co-morbid mental disorders, especially depression and anxiety disorders, was high in people with epilepsy living in LAMICs. The cross-sectional association of these common mental health conditions with poor quality of life were extensively investigated. However, the prospective impact of these co-morbid mental health conditions on functional disability, change in quality of life or on seizure control have not been investigated well. There were numerous efforts to validate short screening instruments like NDDI-E for depression and anxiety disorder in people with epilepsy at tertiary health care facilities, with NDDI-E exhibiting acceptable psychometric properties. But there is a paucity of high quality evidence on the routine detection of common co-morbid mental health conditions in primary health care level or adaptation of screening instruments for routine clinical use.

CHAPTER THREE

3 RESEARCH QUESTIONS

In people with epilepsy attending primary health care in a rural Ethiopian setting:

1. What is the evidence gap on the impact of comorbid mental health conditions on quality of life and functional disability of people living in LAMICs?
2. What is the performance of primary care workers versus a screening scale and standardised reference diagnosis in identification of co-morbid mental disorders?
3. What is the cross-sectional association between co-morbid mental health conditions and quality of life and day-to-day functioning?
4. What is the impact of baseline co-morbid common mental disorder (CMD) symptoms and risky substance use on clinical outcome (seizure control), quality of life and functioning over a six month follow up period?
5. How are co-morbid mental health illnesses experienced and perceived?

3.1 Objectives

To synthesis evidence examining the association of co-morbid mental health conditions in people with epilepsy with quality of life or functioning in LAMICs

In people with epilepsy attending primary health care in rural Ethiopian setting, the specific objectives are to:

- Evaluate the performance of primary health workers (PHC) versus a screening scale and standardised reference diagnosis in identification of co-morbid mental disorders.

- Examine whether co-morbid mental health conditions are independently associated with poorer quality of life and functioning.
- Evaluate the effects of having co-morbid common mental disorder symptoms and risky substance use at baseline assessment on seizure control, quality of life and functioning over a six month follow up period.
- Understand lived experience on mental ill-health and its inter-relationships with epilepsy and identify potential areas for intervention.

3.2 Research hypotheses

1. Co-morbid mental health conditions in PWE will be associated with diminished quality of life (89) compared to those without co-morbidity.
2. People with epilepsy and CMD symptoms will have increased risk of poor seizure control than people with epilepsy alone, modified by poor treatment engagement.

3.3 Conceptual model

The conceptual model was developed taking consideration of the possible relationship between co-morbid mental health conditions in PWE and the most common impacts of having these comorbidities. Presence of stressful life events has been shown to predispose for mental disorder in many research studies (90, 91). In PWE, stigma related to epilepsy has also been found to be associated with mental health conditions, especially depression, in a number of studies (92, 93). Co-morbid mental health conditions in PWE were conceptualised as having an impact on quality of life, disability and seizure control (26, 45, 94). These relationships could be moderated by the social support of the individual, sex, age, marital status and

relative wealth. Detection and management of co-morbid mental health conditions, especially depression, is conceptualised as modifying the relationship between co-morbid CMD symtoms in PWE and quality of life.

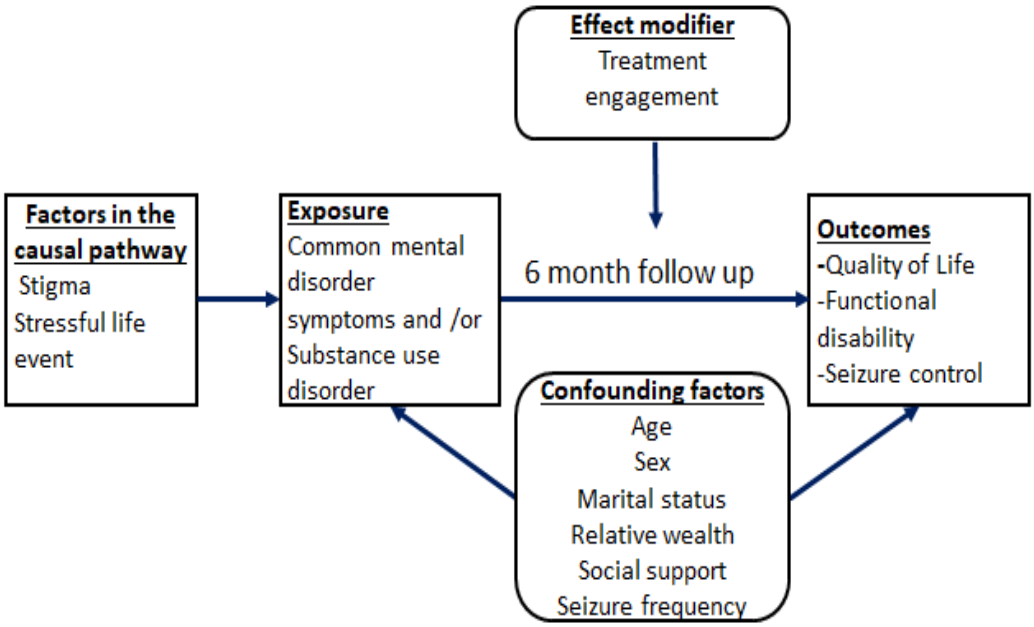

Figure 6: Conceptual model

CHAPTER FOUR

4 STUDY 1: SYSTEMATIC REVIEW AND META- ANALYSIS

Co-morbid mental health conditions in people with epilepsy and association with quality of life in low- and middle-income countries

On the literature review we have found out that there was no high quality evidence (systematic review or prospective studies) from SSA. There was paucity of researches on the impacts of comorbid mental health conditions on functioning and seizure control of people with epilepsy living in Sub-Saharan countries. Therefore, to identify priority areas for future research, we conducted a systematic review and meta-analysis to examine the association between co-morbid mental health conditions and functioning and quality of life in people with epilepsy living in LAMICs.

4.1 Methods

The protocol for this review was registered with the international prospective register for systematic reviews (PROSPERO) CRD42020161487.

4.1.1. Search strategy

The electronic databases of PubMed, EMBASE, Global Index Medicus (GIM), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PsycINFO were searched from their inception date until January 2022. The following key domains were searched: epilepsy, mental health conditions/mental health, quality of life, funtioning/disability and LMICs. Details of the search strategy are described in Supplementary file 1. There were no restrictions on language. The reference lists of retrieved studies were manually searched for additional relevant studies. Other

additional papers were identified from references of related systematic reviews and meta-analyses.

4.1.2. Criteria for considering studies for this review

Types of studies

Any type of quantitative, observational study design (cross-sectional, case-control, cohort study) or randomised controlled trial reporting on quality of life or functioning in relation to co-morbid mental health conditions in people living with epilepsy in LMICs.

4.1.3. Settings

The setting of the study could be population/community-based or carried out in a health facility. The studies must have been carried out in LAMICs as defined by the World Bank criteria (95).

4.1.4. Population / types of participants

Inclusion criteria

- Epilepsy diagnosis (generalized or focal seizures) made by a clinician using the International League Against Epilepsy (ILEA) definition and classification of epilepsy, in which epilepsy is a disease of the brain defined by any of the following conditions: (a) At least two unprovoked (or reflex) seizures occurring more than 24 hours apart; (b) one unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years; (c) diagnosis of an epilepsy syndrome (3).

- Co-morbid mental health condition was assessed as an exposure in the study, and has been described as a medical condition that exists at the time of the diagnosis of the main condition or the index disease or later but is not the consequence of the index disease (96). The types of mental health condition under consideration were as follows: mood disorders (major depressive disorder and bipolar disorders), anxiety disorders, somatic symptom disorders, psychotic disorders and substance use disorders. Diagnosis of comorbid mental health conditions could be by routine clinical evaluation or screening instrument or structured diagnosis by any clinician among people with epilepsy.
- Participants were 15 years of age and above so as not to exclude studies recruiting participants from adult outpatient department of hospitals which manage epilepsy from the age of 15 years.

Exclusion criteria

- The following mental health conditions were excluded: personality disorders, neurocognitive disorders, dissociative disorders, sexual disorders, and childhood onset psychiatric disorders e.g., attention deficit hyperactivity disorder (ADHD).
- Studies conducted in humanitarian settings.
- When participants predominantly included people with co-morbid neurodevelopmental disorders, e.g., intellectual disability or autism spectrum disorders.
- Special populations, for example, people with seizures secondary to neurological infections or substance use.
- Functional neurological symptom disorders.

4.1.5. Outcomes

Primary outcome

Quality of life measured using a standardised, fully structured, quantitative instrument.

Functioning/disability measured using a standardised, fully structured, quantitative measure.

Secondary outcome

Seizure frequency: reports of seizure frequency per month.

4.1.6. Data synthesis and extraction

The identified papers were screened for eligibility criteria by two PhD fellows (RT and AD). Data extraction from eligible studies was done by the first author (RT) and checked by CH (primary supervisor). All identified records with potential relevance were compiled into a database using reference management software (Endnote) (97), from where duplicates were removed. The titles and abstracts were then screened by two independent reviewers (RT and AD), to remove irrelevant studies and reports. Potentially relevant papers were retrieved, and multiple reports of the same study were linked together. All non-English articles were screened in the same fashion using Google Translate. All the steps were properly documented to construct a Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) flow diagram.

A standard data extraction tool was used (supplementary file 2) that included author and year, country, methods (study design, setting, study population, type of epilepsy,

method for diagnosing comorbidity and type of outcome measurement tool) and findings.

4.1.7. Quality and risk of bias assessment

The evaluation of the quality and risk of bias of the included studies was assessed using the Appraisal tool for cross- sectional studies (AXIS) (98) and Newcastle–Ottawa Scale (NOS) for quality appraisal for cohort and case control studies (99). The AXIS tool has 20 questions with “yes” and “no” answers. Seven of the questions (1, 4, 10, 11, 12, 16 and 18) are about quality of reporting, seven of the questions (2, 3, 5, 8, 17, 19 and 20) are related to study design quality and six are related to the possible introduction of biases in the study (6, 7, 9, 13, 14 and 15). For this study, particular emphasis was given to quality of methodology and risk of bias (the justification of sample size, the representativeness of the participants of the target population, non-response bias). For cohort and case control studies we planned to use the Newcastle–Ottawa Scale (NOS) for quality appraisal (99).

4.1.8. Data analysis

A meta-analysis of the measures of association was carried out using STATA version 17 (100). Suitability for meta-analysis was assessed in terms of study design, measurement tools and number of studies reporting similar outcomes. Since different measures of effects were reported by different studies selected for meta-analysis, we used Cohen’s d as a desired measure of effect size with corresponding confidence interval. Cohen’s d was calculated from the mean difference in quality-of-life score between people with epilepsy who did (cases) and did not have a comorbid depression or anxiety disorder (controls or comparison group).

For those studies which did not provide the mean and standard deviation for the outcome, Cohen's d was calculated from unstandardized and unadjusted β (regression coefficients) (101-106) or correlation coefficients (107-110) or the ANOVA t test score (111). We used a freely available web–based calculator and effect size converter to estimate Cohen's d with its corresponding intervals (112, 113).

Meta-analysis was carried out using a random effects model. Methodological heterogeneity (study design and risk of bias) was examined based on the above specified risk of bias tools. Statistical heterogeneity was measured using the I^2 statistic. We conducted a sub-group analysis for those studies using clinician-based diagnosis versus those studies using a screening tool for diagnosis of comorbid mental health condition, the study setting and the income category of the study countries. The median distribution of the effect size with interquartile range (IQR) was also calculated. Meta-regression was done to see whether the subgrouping of clinician-based or screening tool diagnosis of the comorbid mental health condition or the setting (primary versus tertiary heath care) or the income category of the country (low income and lower middle income countries versus the upper middle income countries) had any significant effect on the outcome. A sensitivity analysis was conducted with the exclusion of studies rated as having a high risk of bias and poor quality. Publication bias was assessed by looking for asymmetry in funnel plots and Begg's adjusted rank correlation test. Where there was a marked difference in the presentation of the results and where there were only two studies reporting an outcome in the same manner, only a narrative synthesis was presented.

4.2. Results

4.2.1. Description of studies

The search strategy identified a total of 2,101 articles, of which 220 were duplicates and were removed. Screening of the title and the abstract led to inclusion of 58 articles for full text review. Figure 7 shows the PRISMA flow chart. After reading the full text, only 33 articles were relevant and included.

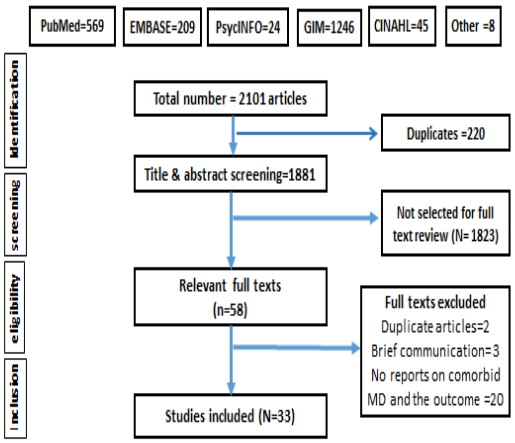

Figure 7: PRISMA flow chart of the selection process of included studies.

'Other' included articles from references of related systematic reviews and meta-analyses.

4.2.2. Study design and settings

All included studies were cross-sectional, with four studies including a comparative group of participants without epilepsy (62, 107, 114, 115). All the cross-sectional studies were able to compare the quality of life/functioning in people with epilepsy with or without comorbid mental health conditions. Twelve of the studies were conducted in sub-Saharan Africa (44, 56, 62, 64, 65, 102-106, 114, 116), thirteen were from Asia (108-110, 117-126), four were from Latin America (107, 127-129) and the other four studies were from Turkey and Serbia (101, 115, 130, 131). All

except seven studies (from Kenya and Ethiopia (44, 62, 102-106)) were conducted in middle-income countries. Most of the studies were carried out in tertiary health care facilities, except for two studies which were conducted at the community level (62, 121), two studies at primary (104, 126) and two other studies conducted at both primary and tertiary levels of health care (103, 105). A summary of the included studies is presented in Table 5.

4.2.3. Participants

A total of 6518 people with epilepsy (PWE) (Males=3294, 50.5%) participated in the 33 studies. Study sample sizes ranged from 31 to 458. Eighteen of the studies included people with focal and/or generalized types of epilepsy (56, 62, 64, 65, 103, 105, 109, 110, 114, 119, 123-125, 127-129, 131), four of them were conducted with people with focal seizures only (107, 108, 115, 122) and one article included people with generalised seizure only (104). Clinician diagnosis of epilepsy was reported in all studies. Additional modes of investigation, e.g. electroencephalogram (EEG), were used in some of the studies. One study presented the results separately for two types of seizure disorder: mesial temporal lobe epilepsy (MTLE) and JME (Juvenile myoclonic epilepsy) (115). Six of the reviewed studies did not report the types of epilepsy (44, 101, 102, 116-118, 120, 121, 126). The duration of epilepsy was also reported in all studies except one (126). In those studies which reported the mean duration of epilepsy, it ranged from 5.89 to 22 years (64, 65, 101, 102, 109, 110, 115, 117, 118, 122-125, 128, 130-132).

4.2.4. Assessment of comorbidities

Depression was the most commonly reported comorbid mental health condition, followed by anxiety (table 5). The Beck Depression Inventory (BDI) was the most

commonly used screening instrument for depression (64, 65, 101, 107, 114, 124, 130, 131), followed by the Hospital Anxiety and Depression Scale (HADS) (44, 56, 102, 105, 106, 119, 120). Seven of the studies used a structured or semi-structured clinician diagnostic tool to measure comorbid mental health conditions (64, 104, 115, 116, 122, 128, 129). Four studies reported on comorbid conditions other than depression or anxieties, including schizophrenia, sleep disorders, substance use disorders and somatoform disorders (104, 115, 122, 128). One study measured social anxiety (109). One study used both screening instruments and a confirmatory diagnostic tool for depression (119). Other screening scales included the Beck Anxiety Inventory (BAI) (101, 107, 125, 130) (table 5). Nineteen of the studies used a validated screening instrument for their respective setting and study population (44, 56, 62, 64, 65, 106-110, 115, 119, 121, 123, 125-127, 130, 131).

Table 5. Summary of included articles on the impacts of co-morbid mental health conditions in people with epilepsy

	Author's name, year of publication	**Country**	**Setting**	**Study design**	**Sample size**	**Types of epilepsy**	**Diagnostic method for comorbid mental disorder**	**Outcome measurement instrument**
1	Abadiga M et al, 2019 (105)	Ethiopia	Public hospital	Cross-sectional	392	Focal and generalised	HADS	WHOQOL-BREF
2	Addis et al., 2021(102)	Ethiopia	Tertiary hospital	Cross-sectional	370	----------	HADS	QOLIE-31
3	Adebayo et al., 2014 (114)	Nigeria	Tertiary hospital	Cross-sectional	102	Focal seizure & Generalized	BDI	QOLIE-31
4	Alanis et al., 2005 (128)	Mexico	Tertiary hospital	Cross-sectional	401	Focal seizure & generalized	Clinician diagnosis of depression	QOLIE-31
5	Ayanada et al., 2020 (116)	Nigeria	Tertiary hospital;	Cross-sectional	74	----------	MINI+	WHOQOL-BREF
6	Baniya et al., 2021 (124)	India	Tertiary	Cross-sectional	352	Generalised and focal	BDI-II	WHOQOL-BREF
7	Camara-Lemorroy, 2017 (107)	Mexico	Tertiary	Cross-sectional	73	Focal with or without generalization	BDI, BAI,	QOLIE-10

8	Chen et al., 2018 (108)	China	Tertiary	Cross-sectional	47	TLE	SDS, SAS	QOLIE-31
9	Ertem 2017 (115)	Turkey	Tertiary	Cross-sectional	60	MTLE JME	SCID	QOLIE-89
10	Espinosa-Jovel, 2016 (127)	Colombia	Tertiary	Cross-sectional	220	Focal seizure & generalized	NDDI-E	QOLIE-10
11	Kanchanatawan B, 2012 (117)	Thailand	Tertiary	Cross-sectional	120	----	HAMD	WHO-QOL-BREF
12	Kassie et al., 2021 (103)	Ethiopia	Primary and tertiary hospital	Cross-sectional	395	GTC & focal	PHQ-4	QOLIE-31
13	Lu Y et al., 2021 (109)	China	Tertiary Hospital	Cross-sectional	148	Generalized, focal and unclassififed	SPS	QOLIE-31
14	Meheta et al., 2014 (118)	India	Tertiary hospital	Cross-sectional	31	----	NDDI-E	QOLIE-31
15	Mesafint et al., 2020 (106)	Ethiopia	Tertiary hospital	Cross-sectional	439	-------	HADS	WHO-QOL_BREF
16	Milovanović et al, 2014	Serbia	Tertiary	Cross-	203	-----	BDI	QOLIE-31

	(101)		hospital	sectional			BAI	
17	Mohamed *et al*. 2010 (119)	Malasisia	Tertiary hospital	Cross-sectional	120	Focal & Generalized	HADS MINI	QOLIE-31
18	Mosaku et al, 2006 (111)	Nigeria	Tertiary hospital	Cross-sectional	51	Focal seizure & generalized	HADS GHQ-30	QOLIE-10
19	Mwangala et al 2018 (62)	Kenya	Community base	Cross-sectional	Cases 64	Focal seizure & generalized	MDI	The MOS 36-ItemHealth Survey
20	Olley et al, 2004 (65)	Nigeria	Tertiary	Cross-sectional	264	Focal & generalised	BDI, CCEI	Seizure control
21	Ogundare et al 2020 (64)	Nigeeria	Tertiary hospital	Cross-sectional	270	Generalised , focal	BDI-II , MINI+	QOLIE-31
22	Phabphal K et al, 2009 (120)	Thailand	Tertiary hospital	Cross-sectional	90	----------	HADS	QOLIE-31
23	Rakesh et al, 2012 (121)	India	Community	Cross-sectional	91	----------	PHQ-2 GAD7	WHO-QOL-BREF

24	Senol et al, 2007 (131)	Turkey	Tertiary hospital	Cross-sectional	103	Focal seizure & generalized	BDI	QOLIE-89
25	Somayajula et al. 2015 (122)	India	Tertiary hospital	Cross-sectional	165	Myoclonic jerks with or without generalization Absence seizure	ICD-10	QOLIE-31
26	Taskiran, et al 2019 (130)	Turkey	Tertiary hospital	Cross-sectional analysis	105	Focal seizure & generalized	BAI &BDI	QOLIE-31
27	Tedrus et al, 2013 (129)	Brasil	Tertiary hospital	Cross-sectional	132	Focal seizure & generalized	Clinician based on DSM-IV or ICD-10	QOLIE-31
28	Tegegne et al., 2014 (44)	Ethiopia	Tertiary hospital	Cross-sectional	415	----------	HADS	WHOQOL-BREF
29	Tsigebrhan et al 2020(104)	Ethiopia	Primary health care	Cross-sectional	237	Generalised	OPCRIT	QOLIE-10
30	Wang et al, 2018 (126)	China	Primary health care	Cross-sectional	458	---------	NDDI-E and GAD-7	QOLIE-31
31	Zhang H, 2021(110)	China	Tertiary	Cross-	165	Generalised , focal	NDDI-E	QOLIE-31

			hospital	sectional		and unclassified		
32	Zhao et al 2012 (123)	China	Tertiary hospital	Cross-sectional	140	Focal seizure & generalized	HAMD-17	QOLIE- 31
33	Zhong R et al 2021 (125)	China	Tertiary hospital	Cross-sectional	221	Generalised , focal and unclassified	PHQ-9, BAI	QOLIE-31

BAI- Beck anxiety inventory, BDI- Beck Depression Inventory, CCEI - the Crown Crisp Experiential Index, DSM- Diagnostic and Statistical Manual of mental disorders, GHQ- General Health Questionnaire, GAD-7- Generalized anxiety disorder, HADS- Hospital Anxiety and Depression scale, HAMD- Hamilton depression rating scale, ICD- International Classification of Psychiatric Disorders, MDI- Major Depression Inventory, MINI- Mini International neuropsychiatric interview, MOS-36 short version of SF-36, NDDIE- Neurological Disorders Depression Inventory for epilepsy, OPCRIT – Operational criteria for research, PHQ- Patient Health Questionnaire, QOLIE- Quality Of Life for Epilepsy, SAS-Self-rating Anxiety Scale, SCID- Structured Clinical Interview for DSM IV, SDS- the Self-rating Depression Scale, SPS- social phobia scale, WHOQOL-BREF- World Health Organization Quality of Life questionnaire

4.2.5. Quality of life measures

Quality of life was the most commonly reported outcome, measured using the Quality of Life in Epilepsy scale (QOLIE)-(10, 31 and 89 item versions) in 24 of the studies, although only fifteen of the studies used a validated version of the instrument for their specific population (64, 101, 107-110, 115, 119, 123, 125-128, 130, 131). The World Health Organization Quality of Life questionnaire (WHOQOL-BREF), a generic measure of quality of life, was used in seven studies (44, 105, 106, 116, 117, 121, 124). One community-based study from Kenya assessed quality of life using the Medical Outcome Study-36 instrument (MOS-36) (62).

4.2.6. Comorbid depression and quality of life

The mean difference in quality of life between people with epilepsy with and without depression was the most common way of reporting the association (14 out of 33 studies) (62, 64, 115, 119-124, 126, 128-131). Two thirds of the reviewed studies presented the final result after adjusting for possible confounders (44, 56, 64, 101, 103-109, 114, 116, 117, 119-121, 124, 125, 127, 128, 131-133). Two studies presented the result as odds ratio (44, 116). One study reported the association of depression with quality of life separately for women and men (125).

When the nineteen studies reporting the outcome (quality of life) measured with the same instrument (QOLIE) were pooled together, a large standardized negative mean effect size (ES) was found (pooled ES= -1.16, 95% confidence interval (CI) -1.70, (-0.63)) between those participants with comorbid depression compared to non-depressed participants. There was significant heterogeneity between the studies (I^2= 97.6%, p<0.001). The median ES (IQR) was -1.20 (-1.40, (-0.64). In the sub-group analysis, those six studies which used a clinician-based diagnosis of comorbid

depression had a similar standardised mean effect size (ES=-1.00, 95% CI -1.40, (-0.60), I^2=82.5) to those that used screening tools (ES= -1.26, 95% CI -2.60, (-0.43), I^2=98.6%). See figure 8. Further sub- group analysis based on country income categories found that the standard mean effect size was intermediate for those studies done in low income and lower middle income countries but not significant (ES= -0.74, 95% CI -1.55, 0.08) (I^2= 97.2%). The same ES was found between the sub-groups categorised based on the setting of the studies. See supplementary file 3. Meta- regression of the ES on the diagnostic method of depression found no significant difference in ES between those studies using clinician based diagnosis and a screening tools for depression (coefficient= -0.24, 95% CI -1.41, 0.92, p value=0.68). There was also no significant difference in ES with meta- regression of sample size (coefficient= 0.001, 95% CI -0.004, +0.005) or between those studies conducted in low-income versus upper middle-income countries (coefficient= -0.63, 95% CI -1.80, 0.54) or those studies recruiting participants from primary versus tertiary health care (coefficient= -0.06, 95% CI -1.60, 1.47).When sensitivity analysis was done by exclusion of studies with poor quality (56, 115, 129), a larger standardised mean effect size was observed (ES= -1.35, 95% CI -1.95, (-0.75), I^2= 97.9%).

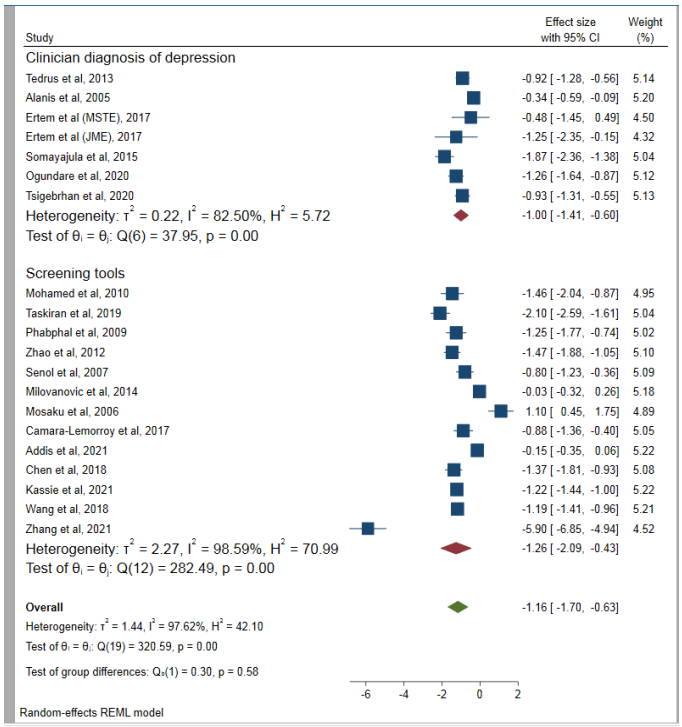

Figure 8: Forest plot of all the studies reporting the quality of life (QOLIE) in association of comorbid depression.

MSTE-mesial temporal lobe epilepsy, JME- Juvenile temporal lobe epilepsy

Those studies that utilised WHOQOL-BREF for assessment of quality of life were pooled together and also found a large negative standardized effect size (ES= -1.12, (95% CI -1.88, (-0.36)), I^2= 96.5%). See figure 9

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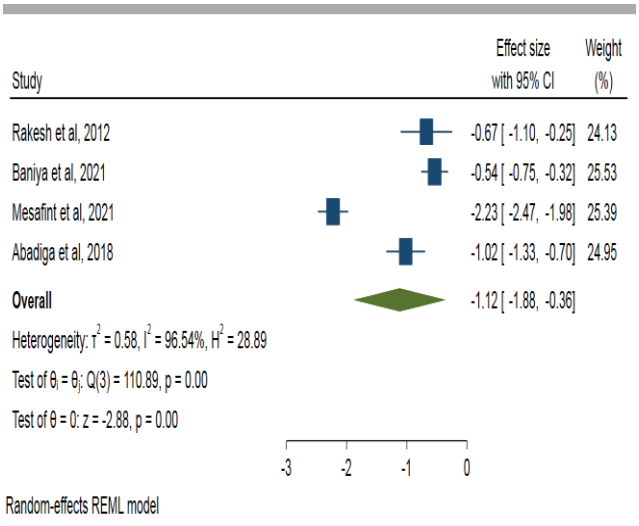

Figure 9: Forest plot of all the studies reporting quality of life (WHOQOL-BREF) in association of comorbid depression

Tegene et al, 2015 (44) also found higher odds of poor QOL in those diagnosed with depression compared to people with epilepsy with no depression (crude OR=22.39 (95% CI 12.44, 40.30)). Ayanda et al, 2020 (116) also found a significant association between comorbid mental health conditions and total score of the WHOQOL questionnaire (p value=0.044).

A study from Kenya which utilised MOS-36 to assess quality of life found significantly lower total quality of life scores of people with epilepsy with comorbid depression compared to those who were non-depressed (mean QOL score (SD) 46.4 (13.3) versus 64.2 (17.7) (62).

4.2.7. Comorbid anxiety disorders and quality of life

A total of sixteen studies reported on the association between comorbid anxiety and quality of life (44, 56, 101, 102, 105-109, 115, 120-122, 125, 126, 130). When all studies using the same kind of instrument for measuring quality of life (QOLIE) were pooled together (eleven out of sixteen) in the meta-analysis, the standard mean effect size was intermediate (pooled ES= -0.64, 95% CI -1.14, (-0.13)). See figure 10. There was high heterogeneity across the studies (I^2= 94.1%). The median ES (IQR) was -0.60 (-1.51, (-0.13)). The pooled ES was similar for studies which used clinician-based diagnosis and screening tools to measure anxiety.

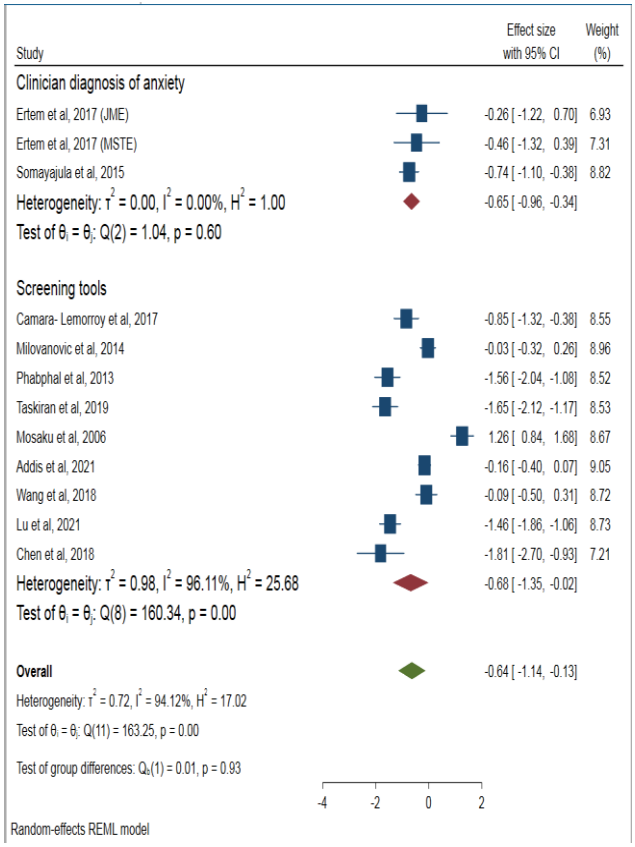

Figure 10: Forest plot of studies reporting quality of life (QOLIE) in association with comorbid anxiety.

MSTE-mesial temporal lobe epilepsy, JME- Juvenile temporal lobe epilepsy

When the three studies which used WHO-QOL-BREF for measurement of quality of life were pooled together, a large negative mean standardized effect size was found (ES= -1.27, 95% CI -2.00, (-0.55); However, there was high heterogeneity. See figure 11. Tegene et al, 2015 (44) found those with anxiety had poor quality of life compared to those people without anxiety (crude OR=9.88 (95% CI 6.05, 16.13).

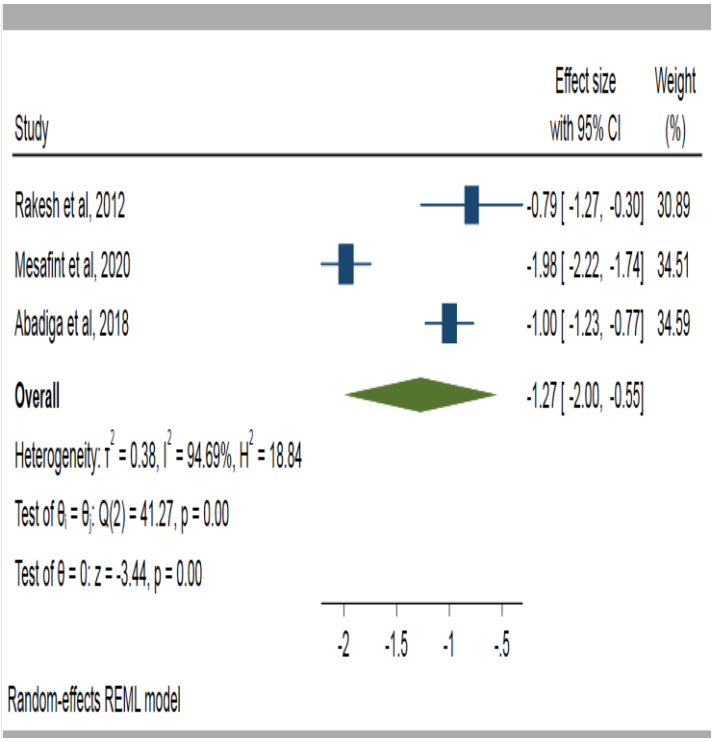

Figure 11: Forest plot of studies reporting quality of life (using WHOQOL-BREF) in association with comorbid anxiety

The number of participants diagnosed with comorbid schizophrenia/ psychosis ranged from 1-5 and there were no separate analysis reported on its association with quality of life (104, 115, 122).

Most studies adjusted for clinical and socio-demographic factors when assessing the association between comorbid mental health conditions and quality of life except seven studies (110, 115, 118, 122, 123, 126, 130). The most common confounding factors considered in the multivariable analysis were education and occupation (56, 101, 102, 106, 121, 128), marital status (56, 64, 102-104, 106, 116, 121, 127), seizure frequency (56, 64, 102, 104, 105, 109, 117, 119-121, 124, 125, 127, 131) and number of anti-seizure medications) (56, 102, 103, 106, 107, 109, 124, 127-129). Some studies also adjusted for age (64, 101-104, 117, 121, 124, 125, 131), sex (56, 101-104, 109, 124, 128) and anxiety symptoms (56, 101-103, 106-108, 120, 121, 125). All these studies found a significant association between comorbid mental

health conditions with quality of life after adjusting except three studies (117, 121, 128). Sleep disorder and seizure control were included in a multivariable analysis for one study which found no significant association between comorbid depression and quality of life (128). Another study adjusted for surgery in addition to other variables and depression was no longer significantly associated with quality of life (117).

The association between anxiety symptoms and quality of life was significant in many of the studies which adjusted for multiple socio-demographic and clinical factors except three studies: a study from Mexico (OR=1.03, 95% CI 0.97 1.09) (107), from Serbia (ß coefficient = 0.188, t = 1.655, p = 0.104) (101) and from Nigeria (ß coefficient= 0.34, p=0.77) (56).

4.2.8. Other outcomes

Only one study evaluated the association between comorbid mental health conditions and functioning and found a negative association (multiplier of WHODAS-2 score=1.83; 95% Confidence Interval (CI) 1.21, 2.76) (104). Only one study assessed seizure control in relation to comorbid depression and found that co-morbid depression was correlated with seizure control (Pearson Correlation coefficient=0.37, p= 0.001) (65).

4.2.9. Quality assessment and risk of bias

The overall assessment of quality of the studies and the risk of bias using AXIS was moderate to low level. The details of scoring and grading of each reviewed study is presented in supplementary file 4. There was incompatibility between objectives and study design in four studies (107, 114, 117, 130). The sample size was not justified in all except nine studies (44, 62, 64, 65, 102-106). The target population was not clearly defined in more than half of the included studies (20 out of 33) and the

representativeness of the sample in relation to the reference population was ambiguous in 60% (21 out of 33 studies) of the studies. The sampling strategy, use of unbiased selection of participants, calculation of the sample size and the rate of non-response were not reported in twenty out of thirty three of the reviewed studies (56, 64, 65, 107-110, 114-118, 120, 122-125, 128-130). Nine of the studies had a sample size less than 100 (56, 62, 107, 108, 115, 116, 118, 120, 121). Both the methods of diagnosing epilepsy and the types of epilepsy were not reported in eight of the reviewed studies (44, 102, 106, 116-118, 120, 126).

4.2.10. Publication bias

Visual inspection of the funnel plot of the nineteen studies included in the meta-analysis for depression and quality of life showed symmetry and there was no evidence of publication bias on the formal test (Begg's adjusted rank correlation test, p=0.50). The studies which were scattered outside the funnel plot with large standard errors may show that that there is high variation in the participants of the studies (figure 12).

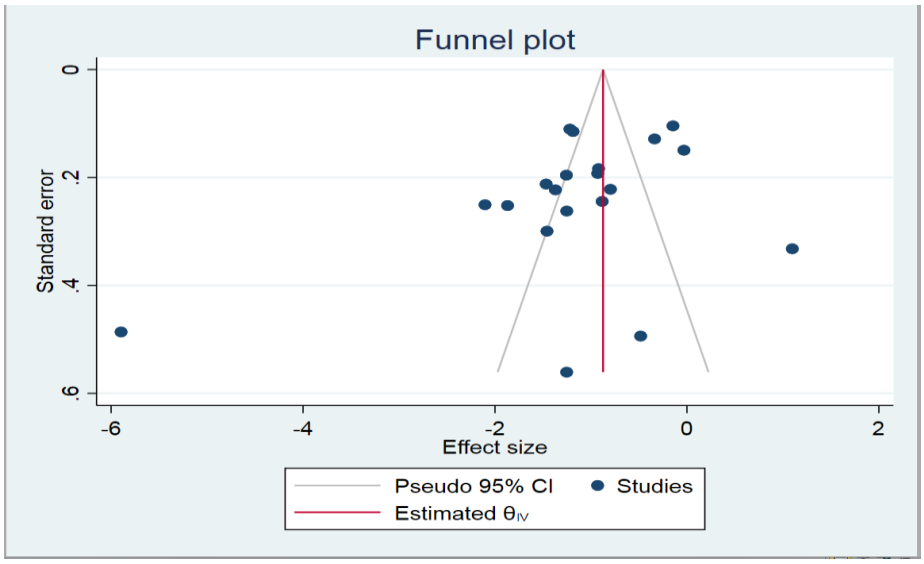

Figure 12: Funnel plot of studies reporting the association of depression with quality of life

CHAPTER FIVE

5. METHODS FOR THE PROSPECTIVE COHORT AND QUALITATIVE STUDIES

5.1. Setting

Four selected districts of the Gurage zone.

The Gurage zone is located in the Southern Nations, Nationalities and People's region (SNNPR) of Ethiopia. Ethiopia is one of the oldest countries in Africa and one of only two to have remained independent of colonial rule throughout its history. Ethiopia is located in the North-Eastern part of Africa. The country is landlocked and is surrounded by Eritrea to the north and northeast, Djibouti and Somalia to the east, Sudan and South Sudan to the west, and Kenya to the south. The country covers an area of 1.13 million square km, with the capital city, Addis Ababa, located centrally. The country has diverse ethnicities and cultures. The official language of Ethiopia is Amharic and the major religions are Christianity and Islam (134). According to the 2022 national census prediction, the total population of Ethiopia was estimated to be above 120 million (135). Currently, Ethiopia is divided into eleven regional states (Tigray, Afar, Amhara, Oromia, Somali, Southern Nation Nationalities and People's Region (SNNPR), South West Ethiopia people, Sidama region, Benishangul-Gumuz, Gambella, Harari) and two chartered cities (Addis Ababa and Dire Dawa). The regions are further subdivided into sixty-eight zones, and then further into 550 districts or '*woredas*' and several 'special *woredas*'.

The Ethiopian health care system is divided into three tiers of service delivery. The first level consists of primary healthcare units (health posts and health centres) and primary hospitals. Each health post is expected to be staffed by two health extension

workers and the focus is on health promotion and illness prevention activities. The health centres give preventive, curative and inpatient obstetrics services. The primary hospitals, the health centres and the health posts together comprise the Primary Health Care Unit (PHCU). Health centres serve a population of 25,000-40,000 people, whereas primary hospitals may serve 100,000 to 200,000 people. But there is not always a primary hospital in every district. The secondary level services are provided by general hospitals and serve as referral centers from the primary hospitals; and tertiary services by specialized hospitals. One specialized / referral hospital serves for five million people. The number of primary health care units is much larger than the other levels of health delivery service units.

The Gurage zone is one of the zones located in the SNNP region. Welkite town is the administrative centre of the Gurage Zone. Gurage languages are spoken as a first language by 80.5% of the population, most of the population are Gurage ethnicity and the majority of the inhabitants were reported as Muslims (51.0%), followed by Orthodox Christian (41.9%) and Protestant (5.8%). The Zone is subdivided into 15 districts (*woredas*). The total area of the Gurage zone encompasses 5,893.40 Km^2 area of fertile semi-mountainous area in the central part of Ethiopia. According to the 2022 Census population prediction of Ethiopia, this Zone has a total population of 1,830,671 (887, 861 men and 942,810 women). The Zone is further subdivided into 15 districts (*woredas)*. Figure 13.

For this study, four districts (Sodo, Eja, Wolikete and Kebena) were selected from the 15 districts included in the zone. Sodo district's total population was estimated to be 194,253 persons (96,120 men; 98,133 women) according to the 2022 national census prediction. Bue is the major town of Sodo district. Eja district has a total population of 115,608, of whom 54,694 are men and 60,914 women and Agena is

the major town of the district. Kebena district has a population of 68,135 of whom 34,121 are men and 34,014 women according to the 2022 national census. The population of Wolikete town is estimated to be of 77,514 of whom 38,842 are men and 38,672 women. In addition to biomedical services, there are also multiple informal, traditional and religious healing centers located in the district (136). Religious centers, in particular 'holy water places' linked to the Ethiopian Orthodox Church, are commonly visited for health problems (including mental illness) which are thought to have a supernatural cause.

The **PR**ogramme for **I**mproving **M**ental health Car**E** (PRIME) was a UK Department for International Development (DfID-funded) research programme consortium across five LAMICs (Ethiopia, South Africa, Uganda, India and Nepal) (137). PRIME was a multi-phase project which aimed to provide comprehensive evidence for the best strategy to integrate and scale up mental health services in primary health care settings. The PRIME study focused on four priority disorders, based on their associated disability and prioritisation by the Federal Ministry of Health of Ethiopia: psychosis, depression, epilepsy and alcohol use disorders. In the *inception phase* of the PRIME project-Ethiopia, a mental health care plan (MHCP) was developed in collaboration with a range of stakeholders, including the Ministry of Heath, health district (Sodo) administrators, health professionals working at PHC, individuals with mental illness and their families (22, 138). The MHCP focused on three levels of the health system: the community, health facility and the health level organization. At the community level, intervention packages included community awareness-raising and stigma reduction about mental disorders and epilepsy, community case detection (psychosis and epilepsy), community-based rehabilitation and support for continuity of care. The MHCP intervention packages at the health facility level comprised

training of the PHC workers to use the World Health Organization's mental health Gap Action Programme (mhGAP) intervention guided(4). The mhGAP intervention guide includes evidence-based packages of care for priority mental, neurological and substance use disorders which can be delivered by general health workers in LAMIC settings. Facility level interventions also included sensitization workshops involving all the clinical staff from each of the health facilities and supervisory decision support. The MHCP intervention package at the health system organization level consisted of support for programme management, proactive stakeholder engagement and sensitization and advocacy (22).

In the next *implementation phase* between 2014 and 2016, the project implemented the programme of care for people with epilepsy, psychosis, depression and alcohol use disorders integrated into PHC (all eight health centres and the primary hospital) in Sodo district. PRIME undertook detailed evaluation of the implementation and, from 2016 onwards, scaled-up the model MHCP to other districts in the Gurage zone. One health centre from each district of the Gurage zone was selected as part of the scale up phase of PRIME.

This prospective study was nested in the scale up phase of the PRIME project. PHC workers in the selected health centres of the zone were trained on priority mental, neurological (including epilepsy) and substance use disorders according to WHO mhGAP (4). As Sodo district was the implementation site of the PRIME project, eight health centres from Sodo were sites for data collection. For the other three districts, one health centre located in each of the selected districts was the focus for collection of data and follow up of the participants. The four selected districts with their respective health centres had all shown tremendous efforts to integrate the mental health services and were also logistically feasible.

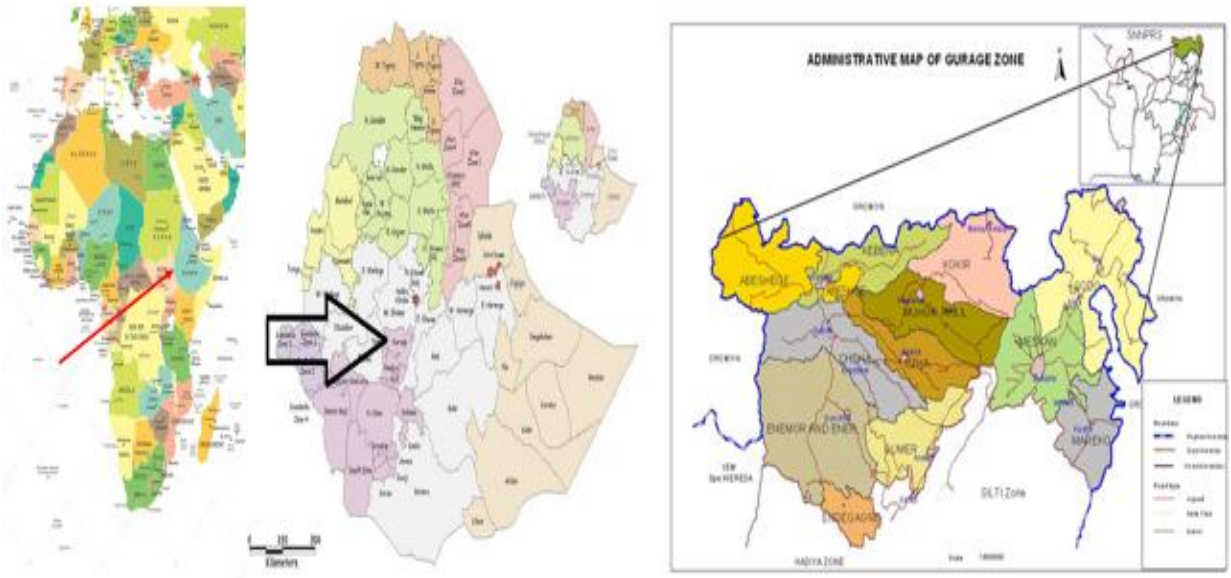

Figure 13 Map of the Gurage zone and its districts

5.2. Study design

Mixed methods - A prospective cohort and qualitative study (sequential exploratory) were part of this PhD thesis. The studies included are described in table 6

Table 6: List of the PhD studies

	Study title	**Study design**	**Source of the data**
1	Performance of primary care workers versus a screening scale and gold standard diagnosis in identification of co-morbid mental disorders in people with epilepsy in rural Ethiopia.	**cross-sectional survey and validation study**	**Baseline assessment of the prospective cohort**
2	Comorbid mental disorders and quality of life of people with epilepsy	**Community based cross-**	**Baseline assessment of the prospective**

	attending primary health care in rural Ethiopia.	**sectional survey**	**cohort**
3	Impact of co-morbid common mental disorder (CMD) symptoms in people with epilepsy in Ethiopia on quality of life and functional disability: a cohort study	**Prospective cohort study**	**Analysis of the baseline and 6 month follow up cohort**
4	Experience and perception of mental ill health in people with epilepsy in rural Ethiopia	**Qualitative study**	**Qualitative study was done after the cohort is completed**

5.3. Source population

The source population for this research project was all people who have a provisional diagnosis of convulsive epilepsy living in the selected four districts of the Gurage zone in rural Ethiopia.

Study population with eligibility criteria

Case detection was carried out by community key informants and health extension workers (HEWs) who had been trained to recognize people who may have active convulsive epilepsy, augmented by house-to-house screening by HEWs (22). Screen positive individuals were referred to the nearby health center and the diagnosis of epilepsy was confirmed by PHC workers who had been trained through PRIME and applied diagnostic algorithms outlined in the mhGAP intervention guide. This two stage screening method has been used previously (139) and was implemented in the PRIME study (22). After confirmation of the diagnosis, clinical care was provided regardless of whether the person was included in this study or not.

Recruitment into the study took place at the point when the person had attended the health centre for health care upon the recommendation of the health extension worker or community key informant. The person was free not to attend the health centre and thus their attendance was assumed to be of their own volition and motivated by their interest to receive treatment. At the point when the person was confirmed to have a diagnosis of active convulsive epilepsy by the primary care worker, the primary care worker introduced the person to the project psychiatric nurse. The psychiatric nurse then screened for eligibility, assessed for capacity to consent to participate in the study and obtained informed consent before the person was recruited into the study. It was made clear to potential participants that whether they agreed to consent to participate had no bearing on the treatment they received from the primary care facility. Figure 14

Inclusion criteria:

- PHC worker diagnosis of active convulsive epilepsy: two or more unprovoked convulsions separated by greater than 24 hours, with one convulsion taking place within the preceding 12 months (140, 141).
- Aged 18 years or above. Since the psychiatric disorders of interest do not have the same kind of presentation in children or adolescents as in an adult population, children and adolescents were excluded. The priority and common psychiatric disorders among children with epilepsy, like intellectual disability and autistic spectrum disorders need special assessment methods which were beyond the scope of this study. In addition, the mechanisms of developing illness, risk factors and the impact of priority comorbid psychiatric disorders with epilepsy in children is expected to be different from adults. Therefore, children with epilepsy were excluded from this study.

- No plans to out-migrate in the next 12 months.

Exclusion criteria

- Communication difficulties due to cognitive or intellectual disability.

  Gross cognitive assessment was done by the primary health clinician after confirmation of diagnosis.

- Unable to converse in Amharic, the official language of Ethiopia.

  Any person who is unable to communicate adequately with the data collectors was excluded at the time of initial assessment.

- Any person who lacked the capacity to consent, assessed by a psychiatric nurse using a semi-structured questionnaire which was used in a recent NIMH-funded clinical trial with people with severe mental disorders (psychosis) in rural Ethiopia (142).

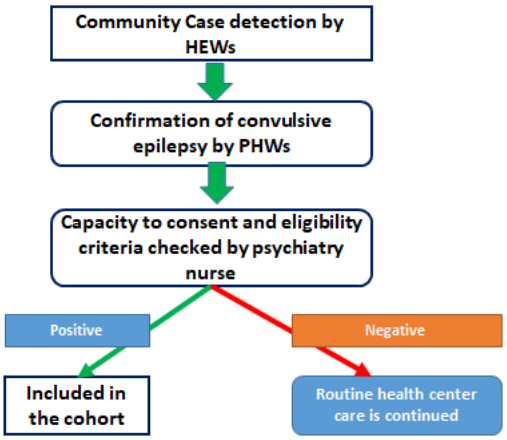

Figure 14: Recruitment outline

5.4. Sample size determination

Based on a large, prospective study, mean quality of life score for people with epilepsy and depression was estimated to be 31.7 (SD 13.06) compared to 19.3 (13.87) in those without (89). A total sample of 50 participants (25 with and without co-morbid mental disorder) would be sufficient to detect this difference, with alpha

0.05 and power 0.8. To allow for detection of a smaller difference in means (mean of 5.0 in those with and without mental disorder) in case contextual factors buffer the impact of mental disorders in this setting, and to allow for detection of secondary outcomes, the required sample size will be 88 in each group. For clustering by health centre (n=4), assuming an intra-cluster correlation of 0.01 (143), the design effect will be 1.21. Allowing for 20% loss to follow-up, a total sample of 256 is required (128 people in each group).

Assuming a prevalence of mental disorders in people with epilepsy of 35-40% (144), around 320 people with epilepsy needed to be screened for mental disorder.

5.5. Operational definitions

Common mental disorder (CMD)– the presence of combination of nonspecific depressive, anxiety and somatic symptoms (145).

Convulsive epilepsy - At least two unprovoked (or reflex) seizures occurring >24 hours apart (3).

Comorbid mental health conditions – the presence of any coexisting or an additional psychiatric disorders based the research criteria for the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) or the International Classification of Disorders (ICD-10) in reference to diagnosis of convulsive epilepsy (146).

Treatment engagement/adherence - the extent to which the person's behaviour follows the prescribed treatment such as keeping appointments and schedules and medication adherence corresponds with agreed recommendations from a health care provider (147, 148).

Seizure control – indicates the frequency or the absence of seizure (149).

Criterion validity – the instrument relationship to the previously established and independent criteria for the same phenomenology (sometimes referred to as the 'gold standard' measure (150).

Construct validity- refers to the extent to which the construct that the measure seeks to address is consistent with the theoretical knowledge or underlying theory of the phenomenon being studied (151).

Convergent validity- a new instrument is strongly associated with another instrument that measures the same concept(s) (151).

5.6. Measurement:

People who give informed consent to participate were interviewed at baseline (T_0), and again after six months (T_1).

5.6.1. Primary outcome (T_0 and T_1)

Quality of life was measured using the 10-item Quality of Life in Epilepsy questionnaire (QOLIE-10-p) (152). This questionnaire was derived from the original QOLIE-89 (153). Initially, the QOLIE-31 was derived from the QOLIE-89 and then the QOLIE-10 was developed from the QOLIE 31. Both of the shorter versions of the original QOLIE incorporated the 7 subscales of the original instrument (QOLIE-89) but 31 items are part of QOLIE-31 and 10 items are included in the QOLIE-10. An additional eleventh item is added to give a weighted total score in the QOLIE-10-p. The 10-item questionnaire has seven components and one item is included in each of the five domains (seizure worry, overall quality of life, emotional wellbeing, energy and cognitive functioning), two items on medication effects (physical effects, mental effects); the last component includes three items on social function (work, driving, social function). The items from QOLIE-10 have been shown to have a good

correlation with the QOLIE-31 items (153). The total mean score ranges from 0- 100. A higher score indicates better quality of life.

Factor analysis of the original scale identified three factors, epilepsy effect, mental health and role functioning, based on the content of the loading of the items on each score (152). The scales were obtained for each of these factors by summing the raw scores of each item that loaded at greater than 0.4 on each factor. The three factors of the QOLIE-10 have been shown to correlate with the corresponding QOLIE-89 counterparts ($p<0.001$)

The English version of the QOLIE-10–p was initially designed to be self-administered. For this study the instrument was translated into Amharic, which is the local language, by the principal investigator and it was then back translated to English language by a non-mental health professional. The final Amharic version of the instrument was prepared after discussion of a group of psychiatrists with expertise in the area. Previous research done in this setting has shown the literacy levels of the general population to be low (154). Therefore, this instrument was administered by lay interviewer rather than self-administered.

5.6.2. Secondary outcomes (T_0 and T_1)

Seizure control:

Seizure frequency in the past one month before the baseline data collection was measured. At the follow-up time-point, the numbers of seizures in the last 6 months (seizure control) were recorded as follows: number per week (if < 1/day), number per month (if < 1/week), number in the last 6 month (if < 1/month). The severity of the seizure is categorized into three as seizure free, low to moderate (1- 2 seizure), and severe/high (≥3) in the past 06 months based on their number. This categorization of

seizure severity has been used in a previous study carried out in an African setting (155).

Functional disability: was measured using the World Health Organization Disability Assessment Schedule version 2.0 (12 item WHODAS-2) (156). The WHODAS-2 is a generic instrument that measures health and disability in six domains of life during the previous 30 days. The six domains include (1) cognition – understanding and communicating, (2) Mobility – moving and getting around, (3) Self-care – attending to one's hygiene, dressing, eating and staying alone, (4) Getting along – interacting with other people, (5) Life activities – domestic responsibilities, leisure, work and school, and (6) Participation – joining in community activities, participating in society. The instrument was developed to be used in both a community population and clinically. There is evidence that the WHODAS performance is independent of the underlying disorder or culture(157). It can be administered by self or proxy or by lay interviewer. The WHODAS 2.0 emphasises health and disability on a continuum, with disability defined as "a decrement in each functioning domain".

The full version of the instrument contains 36 questions and the shorter version has 12 questions. Each question is replied with certain frame of references in mind of the respondent. These are (1) the degree of difficulty (2) the difficulty should be to any health conditions (3) by averaging the good and the bad days in the last one month (4) as the respondent usually does the activity. Each item is scored on a Likert scale starting from "no difficulty" 1 and increases in an ordered fashion to "mild" 2, "moderate"3, "severe" 4 or "extreme" difficulty 5. Even though there are two methods of scoring of WHODAS-2, the polytomous scoring method used for analysis. The total higher score indicates a higher degree of limitations.

WHODAS-2 has been validated in patients with chronic diseases, including epilepsy (158), and has convergent validity in Ethiopia (159, 160).

The psychometric property of the WHODAS-12 item version has been shown to have similar psychometric properties with the 36-item version (157, 161). The 12 item even has shown superiority in understand ability and contextual relevance in a study done in people with severe mental disorders in the Ethiopian setting (161).

5.6.3. Primary exposure (T_0 only)

Depression, anxiety and somatic or common mental disorder (CMD) symptoms: The Self Report Questionnaire (SRQ-20) was used to screen and examine change in comorbid CMD symptoms. The SRQ-20 was developed by World Health Organization (WHO) to screen for common mental disorders in the past 30 days at primary health care level (162). The instrument was developed originally to support the expansion of mental health care. It has been used in different population groups including the elderly and in people with other psychiatric disorders (162). The instrument has 20 questions with “yes/no” answers and it can be easily administered by an interviewer. The 20 items of SRQ-20 covers depressive, anxiety, somatic symptoms and suicidal ideation present in the past 30 days. The total score was calculated by addition of all the positive symptoms and the score ranged from 0-20.

The SRQ-20 has been translated into Amharic and has been validated in postnatal women (163) and at primary health care level (164). It has been culturally adapted and investigated for semantic, content and technical validity in Ethiopia (163, 165). The SRQ-20 has been used several times in rural Ethiopian settings (163, 166). The optimum cut off point for detection of depression at primary health care level was eight (164).

Substance use: use of alcohol, khat and tobacco was measured by interviewer administration of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)(167). ASSIST was developed by WHO as a screening instrument for ten kinds of substances and is used for screening of hazardous, harmful or dependent use of substances. The ten substances included in ASSIST are tobacco, alcohol, cannabis, cocaine, amphetamine type stimulants, sedatives, hallucinogens, inhalants, opioids and other drugs. The instrument helps to identify the lifetime and the past three months of substance use. It also assesses risk of current or future harm, dependence and injecting drug use. It was also developed to be used in different range of health care settings especially in primary health care level. The revised version of the ASSIST (version 2.1) contains eight questions, with questions one to seven asking about use and problems related to substance use, and the eighth question inquiring about use of injectable drugs. Numerical scores are assigned to responses for each questions and the interviewer encircles the numerical number corresponding to the patient's response for each question. The total score for specific substance involvement is calculated by summation of the assigned numerical numbers from questions number 2-7 for each substance class. A low risk is indicated by a score of 0-10 for alcohol and 0-3 for other substances, moderate risk 11-26 for alcohol and 4-26 for other substances and high risk is indicated by a score of 27 and above.

The ASSIST has been contextually adapted in multiple countries including in Africa and Ethiopia (167-169). For the purpose of this study, the ASSIST was used for commonly used substances in the southern part of Ethiopia: alcohol, khat and tobacco (170, 171).

Mental disorder: was measured and confirmed using the Operational Criteria for Research (OPCRIT plus paper version) (146). The original OPCRIT consists of an electronic psychopathological check list of items for diagnosis of psychosis and affective disorders (172). OPCRIT+ was redeveloped with an expansion of items for additional depressive disorders, bipolar disorders, anxiety disorders, personality disorders, substance use disorders, schizophreniform and other psychotic disorders (146). It also includes items for assessment of risk, psychosocial status and prognosis. It gives a simple and reliable method of applying multiple operational diagnostic criteria for diagnosis of a broad range of psychiatric disorders. The OPCRIT+ system was also redesigned for routine collection of a core clinical, research and audit data-set. It consists of items in electronic or paper format that provide definitions of the items, and uses algorithms based on published criteria to provide a classification of subjects. OPCRIT+ has been shown to have good interrater reliability, with a weighted kappa of 0.70 for diagnostic reliability (146).

This check list is being used by trained clinicians in Ethiopian setting (173).

5.6.4. Potential confounding variables (T_0 only)

- Socio-demographic characteristics (age, sex, educational status, income and marital status).
- Epilepsy-related factors (duration of epilepsy).
- Social support – was measured using the Oslo-3 item Social Support scale (OSSS-3)(174). The OSSS-3 is a brief measurement of social functioning and has three items: (1) How many people are you so close to that you can count on them if you have great personal problems? (2) How much interest and

concern do people show in what you do? (3) How easy is it to get practical help from neighbours if you should need it? The total score ranges from 3-14. A higher score indicates a good social support. It has been validated in an African setting (175) and has been used in several studies in Ethiopia including in Gurage zone (154). The OSSS-3 has been shown to have a good predictive and convergent validity (176).

5.6.5. Factors in the causal pathways

- Stressful life events: experience of stressful life events was assessed using **List of Threatening experiences** (LTE)(177). The LTE has 12 categories of significant events in the past six months prior to data collection and it has dichotomous response (yes/ no). After examining the distribution of the data, LTE score will be used as continuous or as an ordinal classification. It has shown good convergent validity and reliability (90). The translated version (Amharic) of the instrument has been used in Ethiopia and Gurage zone (154).
- **Perceived stigma** was measured using the stigma section of the Family Interview Schedule (FIS) questionnaire (178). This instrument has been translated into Amharic and has been used previously in rural Ethiopia to measure stigma in people with epilepsy and their caregivers and those with mental disorders (145, 179). The original questionnaire from the first use of the instrument has 14 items, but the translated version has excluded one item because of redundancy (179). Each item is rated in in four point scale 0 “not at all”, 1 “sometimes”, 2 ”often”, 3 “a lot” regarding the perceived stigma. A total score of one and above is considered as the experience of perceived stigma

5.6.6. Effect modifier

Epilepsy treatment engagement:

Treatment engagement was was considered as the number of attendance/ follow up to the health centre in the last 6 months (during the cohort period). The self-reported attendance was recorded and was ascertained through medical record review of the participants. We defined good treatment engagement as those participants who had ≥4 times health centre attendance in the last 6 month of follow up time.

5.7. Data collection

All measures except baseline mental disorders using OPCRIT was carried out by experienced lay data collectors who has only has completed secondary school education were trained for five days. The lay data collectors were trained using real case scenarios and also practiced the questionnaires before administering them on participants.

The diagnostic assessment of mental disorders using OPCRIT+ was carried out by trained psychiatry nurses. Psychiatry nurses who have a good experience on administration of the instrument were selected to perform the interview.

The interviews were carried out on all participants in the same way and the assessment of the outcome data was undertaken blind to the exposure status (comorbid mental disorders).

5.8. Data processing and management

Immediately after the completion of the data collection the field supervisor made sure that all the items of the questionnaire have been completed. All data were kept in a secure cupboard in the project office. Data was anonymised, identifiable through a

unique project identification number. A password-protected Excel spreadsheet and a separate book (locked up in a different place to the data) were used to link personal identifying details with the project number. A back up of all data files was conducted on a regular basis.

The interview for the qualitative data followed after completion of the cohort data. See on study 4 section for the details of the methodology of the qualitative study.

5.9. Data analysis

Both the baseline and the end phase data were double entered using Epi-data version 3.1(180) and were analysed using STATA software (181). The data was scrutinized for any outliers, incompleteness and inconsistencies and it was cleaned appropriately. The distribution of the continuous variables were examined for normality using histogram and mean with standard deviation or median with Interquartile range (IQR) were used. Percentages and frequencies were used for categorical variables. Histograms were used to see the distribution of the continuous outcome variables (score of QOLIE-10p and WHODAS-12). Further description of the data analysis is shown on the result section of each study.

5.10. Data quality assurance

The principal investigator and the field supervisor were at the site of the data collection and checked the collected data for completeness, clarity and consistency. This was done immediately after the data collection. If there was incomplete or inaccurately filled questionnaire, the field coordinator made sure that the errors are corrected on the same date of data collection.

5.11. Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of the College of Health Sciences, Addis Ababa University and the Research Ethics Committee of King's College London (HR-15/16-2434). Informed consent and witnessed verbal consent (for the illiterate participants) was sought after adequate information was given about the study. The information sheet contained all the details of the study and potential benefits and risks associated with being part of the study. For non-literate participants, an independent witness confirmed to the potential participant that the information sheet has been conveyed accurately and signed to this effect. If the person consents to participate, they were asked to give a thumb print. They were also assured that no matter what their decision was the treatment and the relationship with their clinician or the services of the health facility would not be affected. In other words, it was made clear to potential participants that whether or not they agreed to consent to participation had no bearing on the treatment they receive from the primary care facility. We also offered the participants the choice of meeting the lead researcher should they require further information.

Any person at any age who was detected from the community and referred to the health centres had the opportunity to be diagnosed and managed by those trained PHC workers and had the right to get treatment from the health centres whether he /she was eligible for this study.

The psychiatric nurse assessed the capacity to consent using an approach which has been used in our NIMH-funded clinical trial with people with severe mental disorders (psychosis):

- Is the participant able to express a choice?

- Does the participant make reasonable decisions?
- Does the participant make decisions based on rational reasons?
- Does the participant understand the risks, benefits, and alternatives for their mental health care?
- Does the participant fully understand all relevant aspects of the decision and give a truly voluntary and informed consent?

Those people who lack the capacity to consent were excluded.

If a person expressed suicidal ideation or diagnosed to have a comorbid mental disorders, the project psychiatric nurse made a clinical assessment and instituted an appropriate management plan depending on the severity of risk. In addition, information about places to seek help was given.

Risks The potential risks on this study was estimated to be minimal since the proposed study was observational.

The data collectors and the clinicians involved in this study were trained to be sensitive about taking consent and how to establish a good rapport to handle any psychological distress during the interview. If the participants experienced any form of psychological distress during the interview especially asking about their personal symptoms, they were referred and managed by the psychiatric nurse

They were trained to be sensitive about the power difference between the health professionals and patients.

Adequate amount of time was given to process the information, ask questions and no coercion to participate was implied. The PWE were told that non participation would not affect their regular treatment and they have the right to withdraw at any time.

There might also be a possible burden of the study to the participants and their families by taking up working time for the interview. The participants were free to end the interview at any time if the timing was not convenient or to take a break if they were uncomfortable. Approximately a total of one hour time was needed if all the questions are relevant to a participant and 30 seconds are allocated to each question. There was also small financial compensation (ET 100 birr/ per assessment) for their time.

Benefits

Participants had the opportunity to get appropriate and timely treatment for their mental disorder in their nearby area. New cases who had no awareness of the availability of medical treatments in the nearby health centre or who had been using traditional medicine were detected from the community by health extension workers were referred to the nearby health facility for confirmation of diagnosis and management of their disorder whether they were included in this study or not. The detection and management of the neurologic and mental disorders by trained PHC from the nearby health facility without in the delay of accessing the treatment was a great advantage for the participants. This was belived to decrease the complication of untreated illness, stigma and also minimized the financial burden related to accessing treatment.

Details of mental disorders detected by research psychiatric nurses but not by the PHC worker were communicated to the PHC worker in order to inform their management decisions. The participants may be asked to travel to the health facility for interviewing purpose only during the follow up period of the study in this case there was reimbursement for any transport costs if the participants have travelled specifically for the purposes of participation in this study.

5.12. Dissemination of findings

Some of the results of these studies were published on reputable journals and the last two manuscripts are under review. It will also be disseminated through community advisory board for PRIME (to local community and health administration), the PRIME website, the Centre for Global Mental Health website and newsletters, policy-briefings and personal contacts within the Ministry of Health.

CHAPTER SIX

6. RESULTS

6.1. Study 2

Performance of primary health care workers in detection of mental disorders comorbid with epilepsy in rural Ethiopia

6.1.1. Objective

To evaluate the performance of primary health care (PHC) workers in detecting comorbid mental disorders, by comparing them to a screening scale and comparing their detection to a standardised reference diagnosis of comorbid mental disorders in people with epilepsy in rural Ethiopia. It also tried to clarify the misdiagnosis of PHC in relation to the different sociodemographic factors.

6.1.2. Methods

The validation study was nested within the baseline cross-sectional evaluation of PWE attending primary care. The sample size for the validation study was determined by the cohort study (described above).

Cross-cultural validation of an instrument is a complex process and involves three main phases; the first one is translation and verification of its equivalence, then validation of the translated version and finally adaptation of the scores (151). The SRQ-20 has been translated and it semantic, content and technical validity has been established in the Ethiopian setting (163, 165), although never in the context of people with epilepsy. Validation of an instrument also encompasses criterion and construct equivalence. The detection of comorbid mental disorders by PHC workers were evaluated based on the patient's chart review. The chart documentation review was based on the documentation of the mental disorder or problem on the patient's

card by PHC. Then this was compared with the SRQ-20 result. The clinical evaluation of the PWE for diagnosis of comorbid mental disorders by psychiatric nurses using OPCRIT+ was used as a gold standard measure (standardised reference diagnosis) in criterion validation of the Amharic version of SRQ-20 in PWE. The order of administration of the SRQ-20 by lay data collectors and the OPCRIT+ assessment by psychiatry nurses was randomised in order to avoid an order effect. Both administrators were masked to the outcome of the assessment.

The administration of the SRQ-20 by lay data collectors and OPCRIT+ by psychiatry nurses was done after the evaluation of the participants by PHC workers.

6.1.3. Data analysis

The data were double entered using Epi-data version 3.1 and analysed using STATA version 12 (181). Descriptive statistics using percentages were presented for each of the detection methods (PHC worker, symptom screen and clinical diagnosis). The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of PHC diagnosis against the standardised reference of psychiatric nurse diagnosis was calculated.

The total score of the SRQ-20 was used. The Receiver Operating Characteristic curve (ROC) was plotted by including only those people diagnosed to have common mental disorders (depression and anxiety disorders) and taking the psychiatric nurse diagnosis of mental disorders as a gold standard. The optimal cut off point of SRQ was determined based on the maximum specificity (% of true negatives detected by the SRQ-20) not higher than the sensitivity (% of true positives detected by the SRQ-20). Based on the optimal cut-off score for SRQ-20, the specificity, sensitivity, positive and negative predictive value and Youden's index (specificity and sensitivity-

1) were calculated. The sensitivity and specificity of the combined methods of the PHC workers diagnosis augmented by the SRQ-20 against the OPCRIT + was also calculated.

Pearson's chi squared test was used to examine the difference in the reports of each items of SRQ-20 between those with or without depression diagnosed by PHC workers and compared to those diagnosed by psychiatric nurses.

Logistic regression was used to examine the factors which were associated with misdiagnosis of comorbid mental disorder by PHC workers.

6.1.4. Results

A total of 246 people with epilepsy (PWE) attended the 11 health centres in the four districts for evaluation. Of these, 237 were eligible and were recruited over a period of 11 months (March 2017- January 2018). Seven people did not fulfil the eligibility criteria and the data of two participants were incomplete.

The sociodemographic charachterstics of the study participants are presented in Table 7. The median age of the participants was 30 (inter-quartile range (IQR) = 22-42 years) and there were more males (59.1%) than females. Most resided in a rural area, reported a low or very low income (subjective assessment of wealth) and had not received formal education. Half of the participants were married (51.9%) and were farmers (47.3%). The median family size was 5 (IQR = 4-7). Nearly two-thirds rated their social support as poor to intermediate. Exposure to psychosocial stressors was high: nearly half of participants had experienced a stressful life event in the past six months and 82.2% of them had experienced one or more of the items indicating perceived stigma.

All participants were diagnosed with generalised seizures, with a median of one seizure per month. Of the total sample, 89.5% (*n* = 212) had received biomedical treatment previously (at any time) before being recruited to this study.

Table 7 Sociodemographic characteristics

Characteristics (Total N=237)		**Number (%)**
Median age (IQR)		30 (22-42)
Sex	Male	140 (59.1)
	Female	97 (40.9)
Marital status	Never married or formerly married	114 (48.1)
	Married	123 (51.9)
Education	No formal education	135 (57.0)
	Formal education	102 (43.0)
Employment	Employed	21 (8.9)
	Unemployed	15 (6.3)
	Farmer	112 (47.3)
	House wife	61 (25.7)
	Others *	28 (11.8)
Relative wealth	Low or very low	169 (71.3)
	Average and above	68 (28.7)
Area of residence	Rural	208 (87.8)
	Urban	29 (12.2)
Religion	Orthodox Christian	208 (87.8)
	Protestant	15 (6.3)
	Muslim	7 (2.4)
Median family size (IQR)		5 (4-7)
Number of stressful life events in the past 6 months	None	129 (56.8)
	1 or 2	69 (30.4)
	3 and above	29 (12.8)
Social support	Poor- intermediate	144 (63.4)
	High	83 (36.6)

* includes students and other jobs

IQR: Interquartile Range; SD: standard deviation

Standardised reference diagnosis of mental disorder

The prevalence of mental disorders according to the OPCRIT+ was 13.9% (95% confidence interval (CI) 9.6%, 18.2%). Major depressive disorder (MDD) was the most common comorbid disorder (7.2%, n=17), followed by alcohol use disorder (AUD) (2.5%, n=6), then psychosis (2.1%, n=5). One individual (0.4%) was diagnosed as having both MDD and AUD (0.4%). The prevalence of dysthymia was 0.8% (n=2) and that of bipolar disorder was 0.8% (n=2). An equal number of males (10) and females (10) were diagnosed with depression and dysthymia by the psychiatric nurse using OPCRIT+.

PHC worker diagnosis of mental disorder

Based on the chart review of study participants, 6.3% (95%CI 3.2%, 9.4%) of the people with epilepsy were diagnosed by PHC workers as having comorbid mental disorders: 3.4% (n=8) with MDD, 1.7% (n=4) with psychosis and 1.3% (n=3) with AUD. Of the 8 people with a diagnosis of depression by PHC workers, six were males. The sensitivity and specificity of PHC diagnosis was 21.1% and 96.1%, respectively, compared to the standardised reference diagnosis. The positive predictive value (PPV) of PHC worker diagnosis was 46.7% and negative predictive value (NPV) of 88.3%.

SRQ-20

The total SRQ-20 score was positively skewed. The median score was 7 with IQR of 3-12. When the SRQ-20 score was compared with the standardised reference diagnosis, the optimum cut-off score of SRQ-20 indicating common mental disorder was greater or equal to 9. The area under the ROC of SRQ-20 was 0.74 with 95% confidence interval (CI) 0.62 to 0.82. At this cut-off, 62.1% of participants were

classified correctly, although the PPV was very low (15.1%) (See table 8). The prevalence of common mental disorder at this cut-off (9 or above) was 41.5%.

Table 8. Optimal SRQ-20 cut-off for detection of common mental disorder and associated validity coefficients

SRQ-20 Cut off	Prevalence of common mental disorder	Sensitivity (%)	Specificity (%)	Positive predictive value	Negative predictive value	% correctly classified	Youden's index
≥7	49.6%	90.0	54.4	16.2	98.2	57.6	0.44
≥8	46.0%	75.0	56.9	14.6	95.9	58.5	0.32
≥9	41.5%	70.0	61.3	15.1	95.4	62.1	0.31
≥10	36.2%	65.0	66.8	16.0	95.1	66.5	0.32

Out of the 15 individuals diagnosed to have comorbid mental disorders by PHC workers, only 6 (40%) had an SRQ-20 score of 9 or above.

In people with a PHC worker diagnosis of depression, the most frequently endorsed SRQ-20 items were loss of interest, feeling frightened and getting easily tired. However, there was no significant difference in the reporting of these symptoms between those with or without a PHC worker depression diagnosis. There were multiple depressive and somatic symptoms which discriminated between those with and without standardised reference depression diagnosis by psychiatric nurses (see table 9).

The combination of both diagnostic methods (the SRQ-20 score above the optimum cut off augmented by PHC diagnosis of depression) was also compared with the standardised reference diagnosis of depression. The sensitivity of this combined

approach was 78.9% (95% confidence interval (CI) 73.4, 84.4%) with specificity of 59.7% (95% CI 53.2, 66.2%). However, the PPV was low, at 15.6%.

Table 9. Prevalence of each SRQ-20 items in depression diagnostic categories of PHC versus standardised reference diagnosis

Total SRQ-20 score	**Comorbid mental disorders in PWE diagnosed by PHC n (%)**			**Comorbid mental disorders in PWE diagnosed by psychiatric nurses' n (%)**		
	No comorbidity (n=222)	**Depression (n=8)**	**Fisher's exact test (p value)**	**No comorbidity (n=204)**	**Depression (n= 20)**	**Chi square test (p value)**
Poor sleep	80 (36)	4 (50)	0.47	70 (34.3)	11 (61.1)	3.38 (0.07)
Easily frightened	122 (55)	5 (62.5)	0.73	111 (54.4)	13 (72.2)	0.83 (0.36)
Hands shake	93 (41.9)	1 (12.5)	0.15	79 (38.7)	10 (55.6)	0.97 (0.33)
Worried	119 (53.6)	4 (50)	1.00	108 (52.9)	12 (66.7)	0.36 (0.55)
Poor digestion	55 (24.8)	2 (25)	1.00	44 (21.6)	10 (55.6)	8.05 (0.01)
Trouble thinking clearly	81 (36.5)	3 (37.5)	1.00	70 (34.3)	13 (72.2)	7.35 (0.01)
Feeling unhappy	78 (35.1)	4 (50)	0.46	65 (31.9)	13 (72.2)	8.81 (<0.01)
Crying more than usual	56 (25.2)	2 (25)	1.00	47(23.0)	11 (61,1)	4.68 (0.03)
Difficulty to enjoy activities	69 (31.1)	4 (50)	0.27	62 (30.4)	10 (55.6)	3.21 (0.07)
Difficulty to make	78 (35.1)	5 (62.5)	0.14	70 (34.3)	13 (72.2)	7.35 (0.01)

decisions						
Daily work suffering	80 (36)	4 (50)	0.47	71 (34.8)	12 (66.7)	4.96 (0.03)
Unable to play useful part in life	87 (39.2)	3 (37.5)	1.00	71 (34.8)	16 (88.9)	15.7 (0.00)
Loss of interest	79 (35.6)	5 (62.5)	0.15	67(32.8)	11 (61.1)	3.9 (0.05)
Feeling worthless	89 (40.1)	4 (50)	0.72	77 (37.7)	12(66.7)	3.8 (0.05)
Thoughts of ending life	43 (19.4)	0	0.36	33 (16.2)	9 (50.0)	9.93 (0.00)
Feel tired	132 (59.5)	5 (62.5)	1.00	118(57.8)	16 (88.9)	3.72 (0.05)
Easily tired	100 (45.1)	4 (50)	1.00	84 (41.2)	16 (88.9)	11.1 (0.00)
Poor appetite	91 (41)	3 (37.5)	1.00	78 (38.2)	12 (66.7)	3.59 (0.06)
Uncomfortable stomach	56 (25.2)	1 (12.5)	0.68	43 (21.1)	10 (55.6)	11.1 (0.004)
Frequent headaches	137 (61.7)	3 (37.5)	0.16	118 (57.8)	17 (85.0)	5.61 (0.02)

Factors associated with misdiagnosis of comorbid mental disorders by PHC workers were also examined. As shown in Table 10, only age was significantly associated with misdiagnosis of comorbid mental disorders by PHC workers (adjusted odds ratio (OR) 1.06, 1.02 1.11 for every increasing year of age).

Table 10. Sociodemographic and epilepsy related factors associated with missed diagnosis of comorbid mental disorders by PHC workers

Characteristics		**Univariate analysis**		**Multivariable analysis**	
		Crude odds ratio (c OR)	**95% CI**	**Adjusted Odds Ratio (aOR)**	**95% CI**
Age	**In years**	1.03	1.00, 1.06	1.06	1.02 1.11
Gender	**Male**	1		1	
	Female	1.27	0.56, 2.88	1.67	0.69, 4.09
Relative wealth	**Average and above**	1		1	
	Very low or low	1.10	0.44, 2.76	1.42	0.53, 3.78
Education	**No formal**	1		1	
	Formal education	0.97	0.42, 2.21	1.16	0.46, 2.95
Marital status	**Never married or formerly married**	1		1	
	Married	1.09	0.48, 2.46	2.22	0.82, 6.06
Residency	**Urban**	1		1	
	Rural	1.08	0.30, 3.84	0.96	0.25, 3.67
Seizure frequency		1.04	0.96, 1.13	1.06	0.97, 1.15
Duration epilepsy	**In years**	1.00	0.96, 1.04	10.97	0.93, 1.02

6.2. Study 3

Comorbid mental disorders and quality of life of people with epilepsy attending primary health care clinics in rural Ethiopia

6.2.1. Objective

- Examined the association between co-morbid mental disorders and quality of life and functioning cross-sectionally.

6.2.2. Data analysis

The cross-sectional baseline data was analysed using STATA version 12 (181). Simple descriptive analyses were used to summarise the socio-demographic and clinical characteristics of the baseline assessment of the study participants.

Confirmatory factor analysis was conducted using the AMOS software version 23 for the quality of life measure (Amharic version of QOLIE -10p) against the original three factor structure of QOLIE-10p (152). The overall goodness of fit of the model was measured by the Root Mean Square Error Approximation (RMSEA), Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI). The proposed three structures did not fit the data well and exploratory factor analysis (EFA) with maximum likelihood extraction and varimax rotation was done. The scree plot and eigenvalues were used to determine the number of sub-scales.

A hypothesis-driven analysis was carried out based on the conceptual model. Univariate analysis followed by multiple linear regression modelling was used to examine the association between quality of life and the primary exposures, adjusting for all potential confounding factors identified a priori. A sensitivity analysis was carried out, in which the mental health items of the QOLIE-10p measure were excluded. The polytomous scoring

method was used to calculate the total score of WHODAS. As the score of WHODAS was positively skewed and over-dispersed, negative binomial regression was used to examine the association between clinical and sociodemographic factors and functional disability. Multiple regression was also repeated after including the factors that were hypothesised to be on the causal pathway (stressful life events and epilepsy-related stigma) between co-morbid mental disorder and quality of life/functional disability) to explore possible mediation.

6.2.3. Results

Sociodemographic characteristics – it is similar to study 2 as described above. The clinical charachterstics of the participants is described on table 11.

The mean quality of life score was 69.7 (SD= 19.3) and the median number of days spent with difficulty accomplishing usual activities and work was 5 (IQR 2-8) days of the past 30 days (Table 11).

Table 11 Clinical characteristics of study participants

Clinical characteristics		**Number (%)**
Previous biomedical treatment (lifetime)		212 (89.5)
Median age of epilepsy onset (IQR)		17 (10-27)
Median duration of epilepsy in years (IQR)		11 (0-40)
Median seizure frequency (IQR)/month		1 (0-2)
Mean Quality of Life score (SD)		69.7 (19.3)
Median number of days with disability in the past month (IQR)		5 (2-8)
Median WHODAS-2 score (IQR)		11.1 (5.6 - 27.8)

Diagnosis of comorbid mental disorder		
None		204 (86.0)
Major Depressive Disorder		18 (7.6)*
Dysthymia		2 (0.8)
Psychosis		5 (2.1)
Alcohol Use Disorder		7 (3.1)
Bipolar disorder		2 (0.8)

SD- Standard deviation, IQR- Interquartile range, *one participant had Major Depressive Disorder + Alcohol Use Disorder.

Quality of life

The fit indices of the three factor structure of QOLIE-10p resulted were as follows: χ^2= 195.89, (d.f=32;p<0.0001), CFI=0.85, TLI= 0.79 and RMSEA= 0.15, indicating inadequate fit of the model to the data. EFA showed a unidimensional factor structure with two items (seizure worry and trouble with driving /transportation) loading low (< 0.35). Since dropping of two items makes the instrument non valid, the total weighted mean score of all the items was used for analysis.

In the hypothesis-driven analysis, comorbid mental disorders were associated with decreased quality of life in both univariable (β = -17.04, 95% confidence interval (CI) -26.9 to -7.2) and multivariable analysis (Adj. β = -13.27, 95% CI -23.28 to-3.26). In the sensitivity analysis that excluded the mental health items of the QOLIE-10p, the result was similar.

Low or very low relative wealth (Adj.β coef. = -12.57, 95% CI -19.94 to -5.20), higher seizure frequency (Adj.β coef. = -1.92, 95% CI -2.83 to -1.02), and poor to intermediate

social support (Adj. β coef. = -9.66, 95% CI -16.51 to -2.81) were also associated with decreased quality of life after adjusting for the hypothesized confounding factors. See Table 12.

When comorbid mental disorders and seizure control was entered to the model separately, variation in quality of life was more explained by seizure control (adj. R^2= 16%) than comorbid mental disorders (Adj. R^2 = 9.5%)

Epilepsy related stigma (Adj.β coef. = +4.77, 95% CI +1.97 to +7.56) was associated with comorbid mental disorders but stressful life events (Adj.β coef. = +0.43, 95%CI -0.18 to +1.04) was not associated with comorbid mental disorders. After entering epilepsy-related perceived stigma and stressful life events into the multivariate model, comorbid mental disorders were no longer associated significantly with quality of life (Adj. β coef. = -5.26, 95% CI -14.11 to +3.58).

Table 12. Sociodemographic *and clinical characteristics associated with quality of life (weighted QOLIE-10p score)*

Characteristic		**Univariate analysis**		**Multivariable analysis**	
		Crude β coef.	95% CI	Adjusted β coef.	95% CI
Age (years)		-0.24	-0.52 to +0.03	-0.23	-0.54 to-0.66
Gender	Male Female	1 -1.14	1 -8.32 to +6.03	1 -0.61	1 -7.50 to +6.28
Relative wealth	Average and above Very low &low	1 -11.83	1 -19.49 to-4.18	1 -12.57	1 -19.94 to - 5.20

Education	No formal Formal education	1 2.65	 -4.47 to +9.77	1+0.65	1 -6.48 to +7.78
Seizure frequency/ month		-2.00	-2.92 to -1.07	-1.92	-2.83 to-1.02
Duration of epilepsy/ years		-0.28	-0.63 to +0.06	-0.25	-0.61 to 0.11
Comorbid mental disorder	No Yes	1 -17.04	 -26.92 to-7.15	 -13.27	1 -23.28 to -3.26
Social support	Strong Poor- intermediate	1 -7.99	1 -15.36 to - 0.61	1 -9.66	1 -16.52 to -2.81

Functional disability

Results obtained from the univariate and multivariable models that modelled functional disability are presented in Table 13. Comorbid mental disorders were significantly associated with increased functional disability (multiplier of WHODAS-2 score 1.83; 95% Confidence Interval (CI) 1.21, 2.76). After adjusting for hypothesized confounders, having comorbid mental disorders (multiplier of WHODAS-2 score 1.62; 95% CI 1.05, 2.50) and higher seizure frequency (multiplier of WHODAS-2 score 1.11; 95% CI 1.04, 1.19) were independently and significantly associated with functional disability. When epilepsy-related stigma and stressful life events were included in the multivariable model, comorbid mental disorders were no longer significantly associated with functional disability (multiplier of WHODAS-2 score of 1.28, 95% CI 0.88, 1.86).

Table 13. Sociodemographic *and clinical characteristics associated with functional disability (total WHODAS score)*

Characteristic		**Univariate analysis**		**Multivariable analysis**	
		Multiplier of WHODAS-2 score	95% CI	Multiplier of WHODAS-2 score	95% CI
Age		1.00	0.99, 1.01	1.01	1.00, 1.02
Gender	Male Female	1 1.23	1 0.91, 1.65	1 1.30	1 0.97, 1.75
Relative wealth	Average and above Very low &low	1 1.13	1 0.82, 1.56	1 1.25	1 0.90, 1.72
Education	No formal Formal education	1 1.10	1 0.82, 1.47	1 1.11	1 0.83, 1.50
Seizure frequency/ month		1.13	1.06, 1.21	1.11	1.04, 1.19
Duration of epilepsy/years		1.00	0.99, 1.02	1.00	0.99, 1.02
Comorbid mental disorder	No Yes	**1** 1.83	1 1.21, 2.76	1 1.62	1 1.05, 2.51
Social support	Strong Poor-intermediate	1 1.04	1 0.76, 1.42	1 1.10	1 0.82, 1.48

6.3. Study 4

Impact of co-morbid common mental disorder (CMD) symptoms in people with epilepsy in Ethiopia on quality of life and functional disability: a cohort study

6.3.1. Objective

To investigate the impact of having comorbid common mental disorder (CMD) symptoms and substance use disorder on seizure control, quality of life and functioning over a six month follow up period. The study has the following hypothesises: (1) people with epilepsy and co-morbid CMD symptoms would have increased risk of poor seizure control as compared to people with epilepsy alone and this association is likely to be modified by poor treatment engagement (2) CMD symptoms would indirectly predict the change in quality of life/functional disability through the effect of seizure frequency.

Source population, eligibility criteria, sample size and all measurements are described in the methodology section (Chapter 5).

6.3.2. Data analysis

Data were double-entered using Epi-data version 3.1(180) and was analysed using STATA version 17 (181). Simple descriptive analyses were used to summarise the socio-demographic and clinical characteristics at T_0 and T_1. Wilcoxon ranked sum test or Fisher's exact test were used to examine the statistical significance of differences in baseline characteristics of those who were lost to follow up and those who remained in the cohort. The dependent variables of change in quality of life and change in functional disability were calculated by subtracting the total scores at T_1 from T_0.

Univariate and multivariable linear regression models were fitted to evaluate whether the primary exposure (comorbid CMD symptoms) predicted a change in the outcome variables (QOL and functional disability) adjusting for baseline outcome data. The pre-defined potential confounding variables (measured at the baseline) were also entered to the multivariable model. The risk of alcohol use was entered to the model separately from the total SRQ-20 score (CMD symptoms). Effect modification by number of PHC centre visits (treatment engagement) was tested using interaction term with total SRQ-20 score. A likelihood ratio test was used to examine statistical significance. Univariate and multivariable logistic regression models were used to evaluate the effect of primary exposure (CMD symptoms) on seizure control adjusted for potential confounding variables. Seizures were considered to be controlled for the participants who were seizure free during the 6 month follow-up period.

Structural equation modelling (SEM) was then conducted using R studio version 4.3 (182) to examine direct and indirect pathways linking co-morbid CMD symptoms with quality of life or functional disability. The direct and the indirect pathways linking to the outcome were drawn based on the pre-hypothesised conceptual model (supplementary file 5). Separate SEM was fitted for quality of life and functional disability as two separate outcomes.

Before fitting the full SEM, CFA was carried out for each of the latent constructs of CMD symptoms, stigma, quality of life and functional disability to examine the fit of the measurement models. The goodness of fit of the models was checked for each latent construct using the Root Mean Square Error Approximation (RMSEA), Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI). The significance of factor loadings of each

item and plausibility of the loadings were also examined. Weighted least square estimation was used for the complete data.The SEM was fitted again after multiple imputation of missing data using chained equation (183).

6.3.3. Result

Socio-demographic and clinical characteristics

The study was conducted from March 2017 to June 2018. At T_0, 237 participants were recruited. Of these, 92.4% (n=219) were assessed after 6 months. There were two deaths and 16 participants could not be traced. Participants who were lost to follow-up were more likely to be single or previously married, had worse quality of life, higher functional disability, had increased number of seizure frequency and more stressful life events compared to those who remained in the cohort. See supplementary file 6. Those participants who remained in the cohort had median age of 32 years (IQR 22, 42), one third of them were males (60.3%) and 56.6% had no formal education. Most of them (88.1%) resided in rural area and nearly half of them (46.1%) were married(table 14).

Changes over the follow up period

Over the 6 month follow-up period, participants attended the PHC centre a median of 5 times (IQR 5-6) for epilepsy and/or mental health care.

The median score of CMD symptoms and the risk of alcohol use decreased from baseline to the 6 months follow up assessment (table 14). There was a positive change in quality of life (mean QOLIE-10p score=18.92 (SD =38.19)) and improvement in the score of functional disability (mean -6.77; SD -19.11).

Status at 6 months

Almost half of the participants (45.2%) were seizure free. Almost all (n=189, 90%) were taking one anti-seizure medication (phenobarbitone) and 10% (n= 21) were taking two (phenobarbitone plus either carbamazepine or valproate). Only 8.2% (n=17) were on any psychotropic medication.

Table 14: Characteristics of participants at baseline (n=237) and end line (n=219) (6 months)

Characteristics		**Baseline n (%)**	**End line n (%)**
Age	In years	Median 30 (IQR 22, 42)	Median 32 (IQR 22, 42)
Sex	Male	140 (59.1)	132 (60.3)
	Female	97 (40.1)	87 (39.7)
Residence	Rural	208 (87.8)	193 (88.1)
	Urban	29 (12.2)	26 (11.9)
Education	No formal education	135 (57.0)	124 (56.6)
	Formal education	102 (43.0)	95 (43.4)
Marital status	Single, divorced or widowed	114 (48.1)	101 (53.9)
	Married	123 (51.9)	118 (46.1)
Relative wealth	Low or very low	169 (71.3)	155 (70.8)
	Average or above	68 (28.7)	64 (29.2)
Common mental disorder (CMD) symptoms	Total SRQ-20 score	Median =7 (IQR 3, 12)	Median = 3 (IQR 1, 7)
Life time history of	Alcohol		174 (79.8)

substance use	Khat		16 (7.3)
	Tobacco		8 (3.7)
Risk of alcohol use (ASSIST score)	Low (ASSIST < 10)	126 (67.4)	147 (82.6)
	Moderate (ASSIST 11- 26)	34 (18.2)	28 (15.7)
	High (ASSIST >27)	27 (14.4)	3(1.7)
Quality of life	Weighted QOLIE-10 score	Median 42.2 (IQR 28.7, 66.6)	Median 71.6 (IQR 45.8, 93.5)
Disability	Total WHODAS 12 score	Median 11.1 (IQR 5.6, 27.8)	Median 2.8 (IQR 0, 16.7)
Seizure frequency in past 6 months	0		99 (45.2)
	1		87 (39.7)
	≥2		33 (15.1)
Social support	OSSS-3 total score	Mean 11.0 (SD 1.8)	Mean 11.2 (SD 1.39)

*ASSIST- Alcohol, Smoking and Substance Involvement Screening Test, OSSS- Oslo Social Support scale, QOLIE- Quality of Life in Epilepsy questionnaire, SRQ-20- Self Reported Questionaire, WHODAS- , World Health Organization Disability Assessment Schedule

Regression analysis: Quality of life

CMD symptoms were not significantly associated with change in quality of life (β coef= -0.37, 95%CI -1.30, 0.55) (Table 15). Seizure frequency was significantly associated with decreased change of quality of life in the multivariable model (β coef = -1.73, 95% CI -2.73, -0.74). When the risk of alcohol use was entered to the multivariable model

instead of SRQ-20 score, there were no significant association between those who had moderate to high risk of alcohol use with change in quality of life (β coef. = -0.70, 95% CI -9.20,+7.81) compared to the low risk. There were also no changes in all the variables.

Those participants who had good treatment engagement had a better change in quality of life than those with poor treatment engagement (β coef. =14.6, 95% CI 3.70, 25.51) in the univariable analysis. Treatment engagement did not significantly modify the association between CMD symptoms (SRQ-20 score) and quality of life (interaction coefficient = 1.03, 95% CI -0.93, 3.0; Likelihood ratio test χ^2 =3.48, p=0.18).

Table 15: Univariable and multivariable regression analysis of factors associated with change in quality of life score/ change in functional disability between T1 and T0 (6 months)

		Change in quality of life		Change in functional disability	
Characteristics		Univariate analysis	Multivariable analysis	Univariable analysis	Multivariable analysis
		Crude β coefficient (95% CI)	Adjusted β coefficient (95% CI)	Crude β coefficient (95% CI)	Adjusted β coefficient (95% CI)
CMD symptoms (total SRQ-20 score at baseline)		-0.79 (-1.67, +0.09)	-0.37 (-1.30, +0.55)	0.23 (-0.26, +0.72)	0.03 (-0.48, +0.54)
Gender	Female	-5.60 (-12.99, +1.79)	-4.36 (-12.0, +3.28)	+3.10 (-0.89, +7.11)	+3.31 (-0.80, + 7.41)
Age (years)		-0.02 (-0.31, +0.26)	-0.04 (-0.41, +0.33)	+0.13 (-0.10, +0.29)	+0.13 (-0.07, +0.33)
Education	No formal	1	1	1	1
	Formal	-0.45 (-7.79, +6.89)	-2.96 (-10.64, +4.72)	-1.50 (-5.46, +2.46)	+1.36 (-2.81, +5.54)
Relative wealth	Average or above	1	1	1	
	Low or very low	+3.75 (-4.39, +11.88)	+2.71 (-5.37, +10.80)	-0.14 (-4.46, +4.19)	-0.50 (-4.88, +3.88)
Marital	Married	1	1	1	1

status	Single or formerly married	+3.45 (-3.85, +10.75)	+7.25 (-1.23, +15.73)	-4.36 (-8.26, -0.46)	-3.97 (-8.63, +0.69)
Duration of epilepsy (years)		-0.14 (-0.51, +0.23)	-0.23 (-0.62, +0.15)	+0.15 (-0.04, +0.35)	+0.13 (-0.08, +0.34)
Seizure frequency/month		-1.78 (-2.63, -0.93)	-1.73 (-2.73, -0.74)	0.84 (0.28, 1.39)	0.88 (0.32, 1.44)
Social support (total OSSS score)		+1.08 (-0.98, +3.14)	+1.29 (-0.74, +3.33)	-0.54 (-1.65, +0.57)	-0.59 (-1.69, +0.50)

*****CMD- Common mental disorder, OSSS- Oslo Social Support scale, QOLIE- Quality of Life in Epilepsy questionnaire, SRQ-20- Self Reported Questionaire, WHODAS- , World Health Organization Disability Assessment Schedule

Regression analysis:Functional disability

CMD symptoms were not significantly associated with a change in functional disability (β coef.= 0.03, 95% CI -0.48, +0.54). But only increased seizure frequency was the only factor significantly associated with change in functional disability in both univariable (β coef.=+0.84, 95% CI +0.28, +1.39) and multivariable analysis (β coef.= +0.88, +0.32, +1.44). See table 15. When risk of alcohol use was entered to the multivariable model instead of SRQ-20 total score, there were no significant association between those who had moderate to high risk of alcohol use with change in functional disability (β coef.= -1.31, 95% CI -5.89, 3.26) compared to the low risk. There were also no significant changes in the other variables except that the association between duration of epilepsy and change in functional disability became significant (β coef.=+0.23, 95% CI +0.002, +0.45).

Those participants who had good treatment engagement (≥4 health centre attendance) had a better change in their disability score than those with poor treatment engagement (β coef. =-8.13, 95% CI -14.01, -2.24) in the univariable analysis. Treatment engagement was not an effect modifier of the association between CMD symptoms (SRQ-20 score) and functional disability (interaction coef.= -0.44, 95% CI -1.50, +0.62; Likelihood ratio test: χ^2 =4.65, p=0.10).

Seizure control

In the multivariable model seizure control was not significantly associated with comorbid CMD symptoms (Adj.OR= 0.98, 95% CI 0.93, 1.04).There were also no significant associations between seizure control and any of the socio-demographic or epilepsy related factors (table 16). When risk of alcohol was entered into the multivariable model instead of total SRQ-20 score, no significant association between those who had moderate to high risk of alcohol use with seizure control (OR=1.31, 95% CI 0.66, 2.62) was observed. But duration of epilepsy becomes significantly associated with good control of seizure (OR=0.96, 95% CI 0.93, 0.99). Treatment engagement did not significantly modify the association between CMD symptoms (SRQ-20 score) and seizure control (interaction OR=1.02, 95% CI 0.87, 1.19; likelihood ratio test: X^2 = 0.06, p=0.97)

Table 16: Univariate and multivariable logistic regression of factors associated with seizure control.

Characteristics		Univariate analysis		Multivariable analysis	
		Crude OR	95% CI	Adjusted OR	95% CI
CMD symptoms (total SRQ-20 score at base-line)		1.01	0.99 1.03	0.98	0.93, 1.04
Gender	Females	0**.56**	**0.32, 0.98**	0.64	0.35, 1.16
Age		1.01	0.99, 1.03	1.01	0.99, 1.04
Education	No formal	1		1	
	Formal	0.93	0.54, 1.59	0.86	0.47, 1.57
Relative	Average &above	1		1	

wealth	Low &very low	1.09	0.60, 1.95	1.14	0.61, 2.16
Marital status	Married	1		1	
	Single and formerly married	0.82	0.48, 1.40	1.00	0.51, 1.95
Duration of epilepsy (years)		0.98	0.95, 1.01	**0.97**	**0.94, 1.00**
Social support (total OSSS-3 score)		1.04	0.90, 1.26	1.04	0.89, 1.22

CMD- Common mental disorder, OSSS- Oslo Social Support scale, SRQ-20- Self Reported Questionnaire

Structural equation modelling

The fit indices of each measurement model for stigma, CMD symptoms, quality of life and functional disability have shown adequate fit to the data (supplementary file 7). The fit indices for the full structural model has indicated adequate fit of the model to the data ($\chi 2$ = 1554.2, ($p<0.0001$), CFI = 0.97, TLI = 0.97 and RMSEA = 0.06). In this full SEM, quality of life at T_1 was significantly predicted by seizure frequency in the 6 month follow up period (B= -0.91, 95% CI -1.16, -0.66) but not by CMD symptoms at T_0 directly (B= -0.14, 95% CI -0.31, +0.030) or indirectly through the seizure frequency (B= -0.12, 95% CI -0.26, +0.013). CMD symptoms did not also have significant effect on seizure frequency (B= 0.14, 95% CI -0.015, +0.29). But the total (direct + indirect) effect of CMD symptoms on quality of life was significant (B= -0.27, 95%CI -0.48, -0.056). Baseline stigma was significant predictor of CMD symptoms (B=0.83, 95% CI 0.64, 1.03) and poor social support (B=-0.22, 95% CI -0.42, -0.01) (figure 15).

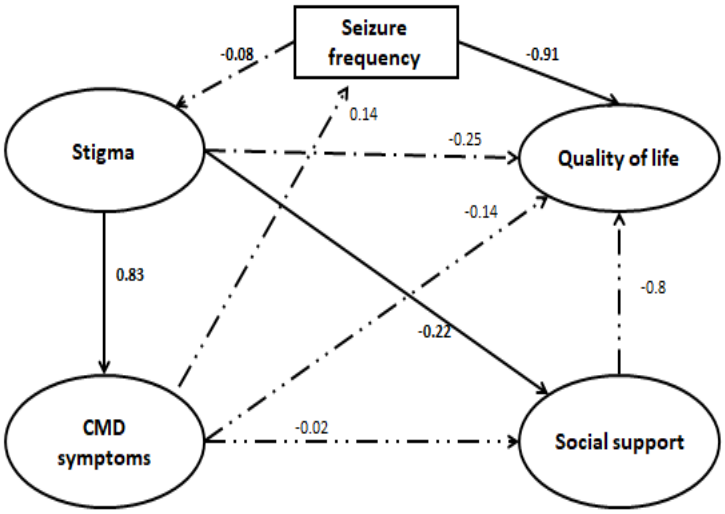

Figure 15 Structural equation model of end line quality of life regressed on the latent construct of baseline stigma, CMD symptoms and social support.

The displayed estimates for regression weights are unstandardized path coefficients (B). Significant weights are indicated by solid-line arrow. The measurement model was not included for simplicity of the figure.(CMD- Common mental disorder symptoms, QOL- quality of life)

When SEM was done using functional disability as an outcome instead of quality of life, the fit indices for the full structural model has indicated adequate fit of the data by $\chi 2$ = 1580, ($p<0.0001$), CFI = 0.95, TLI = 0.99 and RMSEA = 0.06. Functional disability at T_1 was predicted by T_0 CMD symptoms (B=0.24, 95% CI 0.06, 0.41) and seizure frequency over the 6 month follow up (B=0.67, 95% CI 0.46, 0.87) (figure 16). Seizure frequency (B=0.09, 95% CI -0.01, +0.05) did not have a mediation effect on the relationship between CMD symptoms and functional disability. The summative (direct plus the indirect) effect of CMD symptoms on functional disability was significant (B=0.34, 95% CI 0.14, 0.52).

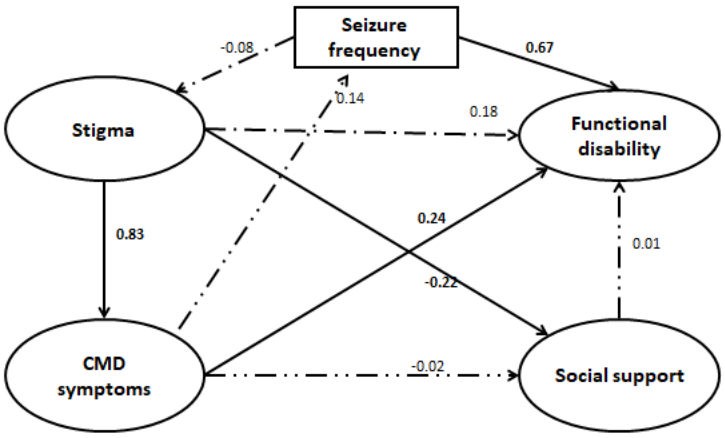

Figure 16 Structural equation model of end line functional disability regressed on the latent construct of baseline stigma, CMD symptoms and social support.

The displayed estimates for regression weights are unstandardized (B). Significant weights are indicated by solid-line arrow. The measurement model was not included for simplicity of the figure (CMD- Common mental disorder symptoms)

Sensitivity analysis

Similar model fit indices were obtained after imputation of missing data. There were some differences noted in the final result of the imputed data. CMD symptoms directly predicting seizure frequency (B= 0.17, 95% CI 0.3, 0.31). The indirect (B=-0.15, 95% CI -0.27, -0.03) and total effect B=-0.28, 95%CI -0.48, -0.07) of CMD symptoms on quality of life through seizure frequency also became significant (See supplementary file 8).

6.4. Study 5

Experience and perceptions of mental ill-health in people with epilepsy in rural Ethiopia: a qualitative study

6.4.1. Research objectives

The aim of this study was to explore the lived experiences of people with epilepsy on mental ill-health and its inter-relationships with epilepsy in Ethiopia.

6.4.2. Methods

Study design

A phenomenological approach was used, including in-depth interviews with PWE. We followed a social constructionist approach as the subjective meaning and the experiences of epilepsy and mental ill-health are shaped and influenced by a person's social life and cultural background (184). This study design was adopted for its suitability to explore the lived experience of PWE.

Setting – the same as the prospective cohort study

In addition to biomedical services, there are also multiple informal, traditional and religious healing centers located in the district (136). Religious centers, in particular 'holy water places' linked to the Orthodox Church, are commonly visited for health problems (including mental illness) which are thought to have a supernatural cause.

Study population and sampling

Participants for the qualitative study were selected purposively from a cohort study of people with epilepsy who had been identified in the community and had engaged with integrated epilepsy care within the Primary health care (PHC) facility. Details of

recruitment into the larger cohort study have been published previously (104) and it is written above on the method section.

For this qualitative study, purposive sampling was conducted, based on gender, age, area of residence, and level of mental distress, as indicated by score on the culturally validated Self Reporting Questionnaire, 20-item version (163, 165, 185, 186).

Data collection

Individual in-depth interviews were conducted to develop a rich understanding of the day-to-day, lived experience of mental ill-health in relation to epilepsy in this context. The topic guide (Supplementary file 9) explored the person's experiences of being diagnosed with epilepsy, having seizures and epilepsy treatment, and its relation to emotional distress (including how this manifested) and mental ill-health; their social life and experiences of social exclusion, and any psychosocial problems they faced; how their self-care, occupation, social life had changed due to epilepsy, how their viewed/thought about themselves and their health and wellbeing, how they sought to manage emotional disturbances, and their perspectives on how care could be improved to achieve better quality of life.

Interviews were conducted in Amharic, the official language of Ethiopia and the language most widely spoken in the Gurage zone, and audio-recorded if permission was given. The principal investigator (RT) and a research assistant with extensive experience of qualitative research carried out the interviews. The location for interviews was a private room in a nearby health facility. Informed written consent was obtained and at all times privacy and confidentiality were maintained. The interviewers had experience of addressing sensitive topics, responding appropriately to any distress

displayed by the respondent. Field notes on the participants' emotional expressions, non-verbal communication and the feelings of the interviewer during the interview were also recorded.

Data management and analysis

Audio-recordings were transcribed into Amharic. Transcripts were then reviewed alongside the audio-recordings as a quality check. The transcripts were then translated into English.

Thematic analysis with an inductive coding approach was used. OpenCode software was used for data management. The first author read and re-read the transcripts to become thoroughly familiar with the dataset. After the initial ideas were jotted down, codes were generated by first author and an independent coder initially using two selected transcripts. Discussion between coders led to refinement of the codebook, also in discussion with CH (primary supervisor) and MS (the third author). The first author then coded the remaining interviews, further modifying the code book and re-coding where necessary. See Supplementary file 10 for the final code book. After all data were coded, themes and subthemes were generated by grouping codes which tapped into similar concepts Following further discussion with CH and MS, other emerging themes and subthemes were generated by grouping and organizing the codes. Participant quotes were selected to illustrate the themes and sub-themes. After forming a thematic diagram of all the themes and sub-themes, they were tested back against the whole data set. We further agreed on the naming and defining the final themes to be reported. The themes were also then interpreted by looking deep into the patterns, meanings and

implications. All quotes were anonymised (participant identification number only) and efforts were made to ensure that the individual was not identifiable from any quotes.

Researcher's reflexivity and positionality

Confidence in the final findings of the study is reinforced by stating an honest and informative account of the lead researcher involved in the field work (RT). Being female, a mental health professional and coming from the city could have intimidated some participants. The information disclosed within interviews may have been influenced by participants' expectations and the socio-cultural and power differences between the interviewer and participants. The setting of the interviews (in a hospital) could have signaled to the participants that the focus was on biomedical ways of knowing. The interviewer began data collection with background knowledge of the epidemiological evidence for the role of various psychosocial factors in triggering or maintaining mental health conditions, which could have influenced the emphasis of the interview and analysis.

6.4.3. Findings

Socio-demographic characteristics

Twenty-two participants were interviewed. A summary of their socio-demographic characteristics is presented in Table 19. The mean age was 32.5 years (18 to 55 years). One third of participants were women (8/22), half had primary education and the majority were farmers (18 out of 22 participants).

Table 16: Socio-demographic characteristics of participants

Characteristics		Frequency (n)
Age	In years	18 - 55
Gender	Males	14
	Females	8
Place of residence	Urban	12
	Rural	10
Education	Non-literate	4
	Primary	12
	Secondary	6
Occupation	Farmer	18
	Daily labourer	5
	Housewife	5
	Student	4
Marital status	Single	9
	Married	12
	Other	1

The following themes and subthemes emerged from the data: expression of ill-health; the essence of emotions; the emotional burden of epilepsy, and aspirations and mitigating impacts

1. Expression of ill-health

1.1. Distress and dysfunction

Participants experienced multiple emotional and bodily difficulties, as well as problems with their power of thinking, particularly when seizures were recurrent. Many of these difficulties were experienced as emotional in nature; for example, including feelings of anxiety, anger or irritability, sadness, disappointment, hopelessness or feeling helpless or suicidal.

> *"It is just an anxiety on my heart….an anxiety on my heart. Even now I sometimes get sick even though I am taking the drug. I get sick. I feel anxious in my heart…… even if I am taking the drugs, the anxiety is on my head day and night*." ID-020, F

> *"I will be simply depressed. When I will be depressed it will goes to my head, it (the epilepsy) doesn't like depression. I was told the disease didn't like depression and then I will try to make my mind free but I can't, at that time I will seize and I will be hurt a lot." ID-02, F*

For some participants there were also unusual and frightening experiences of atypical images and scenes. They were well aware of these unusual experiences and have described them signalling the inevitable occurrence of their seizure.

> *"… it is just I see something in front of me and then I fell. I get very sick….. I feel like someone is speaking to my face, I feel like something is coming on me. I see a lot of stuff…" ID-022, M*

Struggling to think clearly, solve problems, concentrate or remember important things were concerning to participants when they interfered with their ability to accomplish their daily tasks. Similarly for bodily difficulties, including fatigue, loss of balance, headache, poor appetite and pain in the stomach.

> *"I feel tired. I take one tablet in the morning and one in the evening. I just feel tired. I sleep again and again. I don't feel like working. I wake up to go to the toilet then I sleep again….. I wonder 'how am I going to raise my kids?' and I try to work a little then I sleep" ID-025, M*

> *"…my body is no more present, my body has become weak, I feel like an 80 or 100 year old man. Like a very old man, my body is all dead and weak. Now I just cannot run, I cannot even keep my hand straight, it becomes floppy, has become very weak. I don't know whether it is from the way I took the drugs or whether it is from the illness… for example I had a fight with my cousins and they have hit me on the head, my head was hurt very badly. I don't know whether it is from the wound or the illness, my ear drum was damaged, I was very sick for 4 or 5 years. I had a treatment at Butajira… Now I am waddling like a drunken guy. This has also become a problem. The main thing is my body has become weak. I cannot describe this illness. It has made me not to work. I just cannot stay still, I feel dizzy." ID-019, M*

Some respondents were not at all bothered by any emotional or bodily distress, describing their life as any person living in their society without epilepsy. In these cases, they did not face any difficulties in their day to day activities or fulfilling their obligations.

"Thanks to God, I had epilepsy before and then started taking the medication. Now, I take the medication every month and use one pill per day. I am fine now…… I completed my education while doing my work…. I don't also have any problem with my social life." ID- 012, M

1.2. Unified experience

The signs of having epilepsy or mental illness were not considered as a separate illness by most of the participants. They rather had a unified experience of the body and the mind. They experienced both physical and mental health problems at the same time, without distinction, or the experiences followed each other closely.

"when I have pain I lost my consciousness. I don't know where it touched me whether it is my leg or my hand. I feel very irritable…..what shall I do with my life? I lost my consciousness. It made me change …what shall I do? shall I hang myself?" ID- 0017, F

"When I am sick it means I am gone seize. It shows me a sign when it is going to seize me. When I am going to seize it show me signs, I will depressed and then lost interest for everything. After that, I will know myself and sit down or I will be suddenly sick." ID-02, F

Mental distress was also not considered as a separate entity from their social or economic struggles. All the physical, psychological and the financial manifestations were intertwined.

"R: … After I fall (experience a seizure), I start having a headache… And the headache makes me anxious, then I feel like I can't live with this disease.

I: what about difficulty of sleeping?

R: I have that too. I sleep better when I have money in my pocket, if I don't have money I think about what I should do to get the money. That is my biggest worry." ID- 023, M

Much of the concern that participants linked to these difficulties was related to their ability to live adequately or according to their expectations. Emotional distress was linked by some of the participants to the social losses that they experienced because of the effects of epilepsy.

"I used to be much better than this. My friends bought cars and they live much better life. At one point I was much better than them, so I said, 'why did I end up like this?' …" ID- 016, M

For others, feelings of anger were justified by their dire social and economic situation, again linking back to the root cause of epilepsy.

"….. when I cannot fulfil everything, I have to feel angry. It is not that I like to be angry. It is a must. As I said before, as long as you don't fulfil your needs, there is going to be a worry…" ID- 019, M

2. The essence of emotions

2.2. Epilepsy as an emotional journey

Several participants related a detailed social account of how the first seizure happened and emphasised the extent to which this had been a significant turning point in their life, associated with strong emotions. These strong emotions were mirrored in the emotions of those around them at the time of the first seizure. Some of the participants were also overwhelmed by the sudden and unpredictable occurrence of their illness.

"….when it began, my cousin had a graduation ceremony and I was carrying a pot to the kitchen with my cousin. They were shocked when I fell. And they just worried as what it is. All of them said "take her to hospital…" ID- 02, F

"At that time my father died and we went to collect wood to the forest. When we went to the forest, I fall there which I have never experienced before. Then after a while it is known as it is this disease, I didn't know anything about it. It was like a dream" ID- 06, M

"*At the time when the illness started, I used to work at another person house. I was servant and I seized while grinding coffee, I have never felt that way before. ….. I wasn't sick before that and then I became sick" ID-09, M*

2.1. The power of emotions

Several participants framed the onset of seizures in terms of an emotional shock that resulted from a life stressor. The stressful events reported by the participants included loss of property, grief or severe financial constraints. But it was their effect on the person's emotional equilibrium that was linked to the onset of epilepsy.

"I bought a land and was building a house on it then I was betrayed, that is how the anger started and with the anger came the epilepsy…. I haven't stopped doing my job, I'm still doing my job. I think the epilepsy is related to the way I feel and think….. when I feel anxious the epilepsy starts" ID-016, M

"…I think it started around 1986 EC. My older sister was sick and I cried a lot. I do not know whether I have the disease before that but after that I have it…That is how it started. Then my sister died, I loved her so much, the way she died was

also very sad, she died suddenly, I cried a lot. At the time I cried till I lose my consciousness. Then I started to get sick that night" ID-019, M

The presence of emotional turmoil was not only considered in the onset of the epilepsy it was also reported to trigger seizures for most participants. Feeling depressed or anxious or feeling anger was considered to be the most potent emotions. Disruptive relationships with a close family member were reported to be the most common reason for the flaring up of these negative emotions.

"If I have a fight with someone and if I am angry, I get sick, I feel it…. when I have a fight with my father, If I am with him and if he does something to me or insult me when we fight, I feel upset and get sick" ID- 022, M

"when I got depressed, I just know it. Most of the time, I spend the day at home fearing that it might make me faint/ seize. I hate working…It's just that he [her husband] has no sympathy. He doesn't think that I get sick if I get angry. If he doesn't speak to me in good spirit, I get angry. If he speaks to me arrogantly, I get unconscious. There are times that I get unconscious while I am sitting. He speaks nonsense to me and then I get unconscious and for a while I couldn't identify a person. I realize that I got so sick after I return back to myself" ID-011, F

3. The emotional burden of epilepsy

3.1. Living apart from others

Almost all participants reported the experience of stigma from their community or their school friends or their close family members, rooted in the fear that the illness will be

transmitted to them. Only a few participants, specifically those who had never had a seizure in a public place, led their social life as any person in their society. The participants even had the apprehension that the illness would be transmitted to their family members and therefore tried to isolate themselves. In this sense, the isolating actions of society were understandable to participants.

" *……. there are other people in the society who tries to discriminate me because of my illness. I mean in our area…… they will say like'if someone has epilepsy, don't have a bright mind, or he is crazy'. Both you and me, there is nothing we can do. You cannot be in other persons shoe and judge them. This is what I say regarding the illness……..One of my children, my second child, he urinates while he is sleeping. As I told you before, I am worried that his mind is not working properly. Even I am worried than him, because I have a suspicion that this illness is inherited to them (my children) and they are gone suffer*" ID-019, M

Some participants reported that they were not able to accomplish their social duties, like going to funerals or weddings, because they were not able to contribute to the social activity both in terms of money and labour. For some, they avoided going to crowded place with the anticipation of having a seizure. For some participants, even their close acquaintances advised them not to be part of any stressful gatherings to protect them from being sick. Participants reported being irritable due to feelings of being unwanted, which in turn made it difficult to get along with their family and neighbours and reinforced their separation.

"*Because I am sick even if I was at home I don't go to funeral places, I don't go to weddings, I don't go places where people talk and discuss. It (the epilepsy) does not allow it "*ID-023, M

"… I was sick previously at the funeral. They (neighbours) said they won't be upset if I don't come they said that 'please don't come to funeral what if something happens to you'. All the women in the neighbourhood know my situation…" ID- 020, F

3.2. Not living as expected

The participants also reported that they were not able to work as they used to before they developed epilepsy. Some experienced the re-appearance of seizures when they were involved in hard labour work and so this was purposely avoided. For some, experiences of fatigue, dizziness and excessive sleeping decreased their full potential to work. Some had a fear that they might get hurt if a seizure happened while they were at work; for example, while at the fireplace or while fetching water.

The deterioration of their capacity to work and income was devastating, especially for the male participants when they compared it to their previous pre-seizure life. The female participants said that when they were sick they were not even able to do simple house chores. Their children or the neighbours were the one who helped them. This made them feel a burden on their family.

"Sometimes people say he is not like he used to be, he is sick, he can't work and they discharge me. The people I work with tell people that I'm not like I used to be because I can't climb up the roof. It has affected my work. It's not like it used to be." ID 016, M

" I can't get close to fire, I can't go to the river, I can't walk a long distance, I can't go anywhere. I have to stay around the house. If I fall into a fire or if I fall into a river there is no way back no one can help me, I will die." ID- 0023, M

Some participants described the consequence of having the epilepsy on their education as they were forced to discontinue school or were absent for most days. They reported that the routine school activities stressed them which later exacerbated or triggered their seizures.

"…. I hate education when I am sick. I don't know why I say I don't want to go to school. I will be stressed when I entered into the class. I didn't hear when they talk and teach. I used to have good results, but I am losing now since I will be absent many times" ID- 02, F

"I discontinued it (my education) when I got sick. I feel anxious when I learn. Whenever there is an exam, I started to have seizure. That is the reason I discontinued." ID-022, M

4. Aspirations and mitigating the impacts

4.1. Anticipation of cure and a better life

Cure from the seizure and ceasing of the mental distress were desired the most. Participants sought advice from traditional healers and spiritual treatments when their epilepsy was not managed as they wanted. A sense of helplessness was reported by some participants, feeling that they had no control over what was happening to them or what would happen next. At the same time, control of the illness and cure by an external deity remained a hope, while also invested in medication.

"Even if I am taking the drugs the anxiety is on my head day and night. If I don't stop the drugs, it (the seizure) is notgoing to relapse. They say to get to a holy water rather than the hospital, so I went to Hawasa, to Goro, to Addis Ababa Shunkuru holy water…. what can I do? I just kept saying that may God reveal everything…. What can I do? My God reveal it to me…. I just need to take these drugs and one day it might be all cured." ID-020, F

"But if I want to be cured, for example, I am praying to God asking him 'how you are going to save me?'. I am praying for God to save me, but I don't know when it is going to happen at this time. Your pill are helping me, it makes me feel healthy" ID-05, F.

They also aspired to better job opportunities and identified the importance of financial assistance for those people who had the same kind of problem as them.

"I wish I could work with my friend. I wish there is some work created for me and do that. The society should find me a job when my friends are doing some jobs. I would be happy if I work, give me a job. Even if I was not able to work as them, it will be good if I work other jobs." ID-022, M

4.2. Community responses and hopes

Respondents spoke of the need for community respect of their right to be loved and be treated equally, like other people.

"…they have to think and understand that we used to be equal like them. We were equal…. They should wonder that what happened to this guy. It was because of the illness that he has become below us. They have to think about this. This must be improved" ID- 025, M

Participants suggested that education of the community about epilepsy and mental illness would decrease stigma and improve the lives of people with epilepsy.

> *"I would prefer to be able to teach people about this when they are in such difficult situation, along with the health workers…. The community should just tell for others in the area….The community expected what should be done when someone fall in front of them. You should tell what they have to do and then the community will help patients as much as possible if they know what do."* ID-012, M

Even though some participants reported community exclusion related to epilepsy, others also mentioned ways in which community members helped them to manage their illness. For those participants who received emotional and financial support from their family or the community members, this played an important role in relieving their problems. Family members supported them, reminded them to take their medicine, to attend for regular follow up at the health care and helped with household chores.

> *"I don't do any work. He (her husband) is the only one who knows my anxiety. He is the only one. He knows about my anxiety and he is .. Everything for the house"* ID-020, F

> *"The community is supportive and they aid. There is no community which is more supportive than this community. The people of this town are very nice. They care too much for people. I can't tell you, they are very nice for other people. ID-03,F*

> *"People in the society love me. They tell me to follow up on my treatments and take care of myself. I have a good relationship with people in the society."* ID-016, M

4.3. Formal care for emotional support

There were only a few participants who have received evaluation of their mental health problems or any emotional support from a primary health care professional alongside the usual education on anti-seizure medication. For those who did get this service, the psychological support and health education was very helpful to them.

> *"The doctor could not be able to follow-up me well but he advised me several times to don't be stressed before. But I don't know, I try to be happy when I am with my friends but I can't; I didn't do that intentionally. Then he tells my family that she is just worrying about simple things." ID-02, F*

> *"He (the health professional) asks me about my personal life. He says "don't worry about the past don't get angry you shouldn't stress that is what gets you sick". He is the only one who advises me I haven't talked to anybody else. He gets very upset when I don't take the medicine properly because he loves me." ID-016, M*

4.4. Acceptance of the illness

Accepting their illness has also helped some of the participants to cope with the various social pressures. Justifying the occurrence of their illness as being due to an external authority provided a moral relief from the feeling of helplessness.

> *"Some of your family will discriminate you. There are some who care about what you eat, but there are those who wish your death. But I don't care; I already got it so you cannot do anything. What can I do, it is an illness that God gave me."* ID-05, F

> *"This is a problem….it is my condition that brought it on me so I don't feel bad or angry. I just say thank God, I've worked when I wasn't sick. I don't feel upset when people say that because I've worked for many years."* ID 016, M

CHAPTER SEVEN

7. DISCUSSION

This PhD thesis is based on high quality and timely evidence on co-morbid mental health conditions in PWE living in a rural setting in Ethiopia. I will now summarise the key findings in relation to the specific objectives of my PhD.

7.1. Systematic review and meta-analysis

Objective 1: Synthesis of evidence examining the association of co-morbid mental health conditions in people with epilepsy with quality of life or functioning in LAMICs**.**

A pooled estimate for the association between co-morbid depression in PWE and quality of life was found to be significant (−1.16, 95% CI − 1.70, − 0.63)), based on 3390 participants in 19 studies.

Even though there was high heterogeneity among the studies, the meta-analysis indicated that depression has a large negative effect on quality of life. There was also an intermediate negative effect of anxiety symptoms (pooled ES = −0.64, 95% CI − 1.14, − 0.13) on quality of life.

7.2. Detection of co-morbid mental health conditions in routine healthcare in PWE

Objective 2: To evaluate the performance of primary health workers (PHC) versus a screening scale and gold standard diagnosis in identification of comorbid mental disorders.

The performance of primary health care (PHC) workers in diagnosing comorbid mental disorders against a standardised measure and a screening instrument (SRQ-20) for common mental disorders was examined, their sensitivity of the diagnoses was low,

although they had high specificity in relation to the standardised reference diagnosis. The psychometric properties of SRQ-20 indicate an optimal cut-off score of 9 and above, with moderate sensitivity and specificity but low positive predictive value. When the two diagnostic methods (SRQ-20 screening augmented by PHC workers diagnosis) were combined, the sensitivity was markedly improved but the positive predictive value remained low. Misdiagnosis of comorbidity by PHC worker was significantly associated with increasing age.

7.3. Association between co-morbid common mental disorders and quality of life and functioning

Objectives 3 and 4

1. To examine whether co-morbid mental health conditons are independently associated with poorer quality of life and functioning cross-sectionally.
2. To evaluate the effects of having co-morbid common mental disorder (CMD) symptoms and substance use disorder at baseline assessment on seizure control, quality of life and functioning over a six month follow up period.
    a. Hypotheses:
        i. Co-morbid mental health conditions in PWE will be associated with diminished quality of life (89) compared to those without comorbidity.
        ii. People with epilepsy and CMD symptoms will have increased risk of poor seizure control than people with epilepsy alone, modified by poor treatment engagement.

iii. CMD symptoms would directly and indirectly predict change in quality of life and functional disability through the effect on seizure frequency

We found that comorbid mental disorders in PWE diagnosed by psychiatry nurses were associated with both poorer quality of life and impaired functioning cross-sectionally. Seizure frequency was also associated independently with poor quality of life and impaired functioning. However, in hypothesis-driven regression analyses, neither baseline CMD symptoms nor risky alcohol use were associated with change in functional disability or quality of life at follow-up, not moderated by treatment engagement. However, structural equation modelling indicated that baseline CMD symptoms had a significant direct impact on functional disability at follow-up. Only the summative effect of CMD symptoms on quality of life was significant. In contrast to the initial hypothesises there were no significant association observed between seizure control and comorbid CMD symptoms.

7.4. Experience and perceptions of mental ill-health in people with epilepsy in rural Ethiopia

Objective 5:

To explore the lived experiences of people with epilepsy on mental ill-health and its inter-relationships with epilepsy and identify potential areas for intervention

People with epilepsy related multiple experiences of mental ill-health, ranging from negative emotions to the extent of considering ending their life, alongside multiple physical health problems. Occupation and social life difficulties interconnected with their

emotional and bodily sickness. Bad emotions were reported as the initiator or precipitator of seizures and negatively impacted upon their social life and functioning. Cure was anticipated by most participants, together with the hope of better job opportunities and financial assistance. Family, community and health professional support helped many, but not all, to cope with the psychosocial adversities associated with stigma and chronic illness. For some, acceptance brought relief.

7.5. Findings in relation to the evidence base

7.5.1. Synthesised evidence on co-morbid mental health conditions in PWE and quality or life and functioning

This systematic review replicated findings from HIC of strong impacts of depression on the quality of life of people with epilepsy (187, 188). Regardless of the income status of the country or the type of epilepsy under consideration, the influence of comorbid depression on quality of life was consistently observed. The evidence from HICs is stronger as the association has been measured prospectively (189) and synthesized in systematic reviews (187, 188), whereas we were only able to identify cross-sectional studies for our review. This may overstate the strength of the association and does not illuminate the temporal relationship between co-morbidity and quality of life in people with epilepsy in LMICs. The intermediate effect of anxiety on quality of life was seen but a larger effect was found when the instrument for assessment of quality of life was WHOQOL-BREF. There were far fewer studies which used this generic quality of life assessment tool compared to the epilepsy-specific QOLIE. The intermediate effect of anxiety on quality of life could be due to the higher prevalence of mood disorders than anxiety (14). Depression has been also observed to be consistently associated with

quality of life regardless of the people with epilepsy were treated or refractory to anti-seizure medications (187).

The findings from this meta-analysis should be interpreted with some caution since most of the analysed studies were found to be moderate to low quality. The study designs of all reviewed studies were cross-sectional, and it is possible findings more reliable designs eg prospective studies may have been different. Cross-sectional studies have the limitation of not identifying the temporal association of comorbid mental health conditions and quality of life or functioning. Almost all the studies recruited participants from outpatient departments of tertiary health care facilities, except four studies (62, 104, 121, 126). This method of recruitment is likely to be unrepresentativeness of the population of people with epilepsy since most people who are treated at these centres have a more severe form of illness and/or have resources to access these centres. The quality of the included studies was also affected by the lack of justification for the sample size. The overall poor quality and the variation in the methodology of the reviewed studies may have contributed to the statistically high value of heterogeneity. Though there was no difference in the effect size for those studies using the clinician versus screening tools for depression or anxiety, the high heterogeneity of the studies could also be due to the variation in the screening instruments used to measure depression and differences in the application of validated cut off scores between studies

7.5.2. Detection of comorbid mental health conditions by PHC workers in Ethiopia

The low sensitivity of the PHC workers in detection of depression in our study sample is consistent with other studies carried out in Ethiopia and other parts of the world (32, 190-192). In this current study, less than half (45.5%) of the people with epilepsy and comorbid mental conditions were detected by PHC. Very little research attention has been paid to investigating the detection of comorbid mental disorders in people with epilepsy in routine clinical practice in low-income country settings (46). Under detection and management of comorbid common mental disorders has consistently been found to be a problem in high income countries (HIC), despite the high prevalence of co-morbidity in people with epilepsy (31, 193). One of the reasons identified for this under-detection is the soloed approach to care for people with epilepsy and mental health conditions, both in terms of inadequate training of neurologists in the psychiatric aspects of mental disorders and poor communication between the neurologist and psychiatrist (31). In addition, failure of the training programme on psychiatric aspects of commonly occurring neurologic disorders for psychiatry residents, lack of interest in neurologic literature and the absence of psychiatrist in the team of neurologists were seen in a study from the USA (31).

This issue in low income countries like Ethiopia is different from the HIC where more frontline management of epilepsy is expected to be carried out in primary care, with little access to either neurologists or psychiatrists (22). Health professionals working at the primary health care level are also expected to detect and manage five priority mental disorders based on their training through mhGAP (22). It was shown previously that the

PHC workers in rural primary health care in Ethiopia were more likely to detect people who presented with psychological than somatic symptoms, even though somatic symptoms are the more common presenting symptoms, and tended to detect those who had more severe forms of depression (32).

The sensitivity of SRQ-20 in screening for depression was not at a satisfactory level in people with epilepsy but the scale performed relatively well in the general population of Ethiopia and in a similar setting of Eritrea (164, 194, 195). There is minimal evidence on the validation of SRQ-20 in special populations like people with epilepsy which has made it difficult to compare our findings to previous work.

7.5.3. The prevalence of comobid mental health conditions in PWE in Ethiopia

The prevalence of comorbid mental disorders in people with epilepsy was high in this rural Ethiopian setting compared to the general population (196) but lower than studies conducted in high income countries (197). The lower prevalence of comorbid mental disorders could be due to the study setting. This study was done in a primary care setting whereas people with more severe forms of epilepsy (and higher risk of co-morbid mental health problems) could have been referred to secondary or tertiary health care. The low prevalence could also be due to the generally low levels of detection of common mental disorders in rural Ethiopia (32). The way in which depression and anxiety manifest and the non-biomedical causal attributions of depressive/anxiety symptoms in this socio-cultural context (198) could have contributed to the low detection by mental health professionals applying Western diagnostic criteria (32). The diagnosis and presentation of depression in Ethiopian culture appears to include a combination of anxiety, somatic and depressive symptoms rather than typical DSM criteria of

depression (164). This might have masked and contributed to the absence of diagnosis of anxiety disorders in this study. Psychiatry nurses could also be biased towards diagnosing more severe conditions like depression than anxiety disorders in their clinical practice.

7.5.4. Association between comorbid mental health conditons / CMD symptoms and quality of life in Ethiopia

The cross-sectional association between comorbid mental disorders and poor quality of life is consistent with the findings of previous studies carried out in both high-income and LMICs (15, 45, 62, 89). Higher seizure frequency has also been shown to be associated with poor quality of life (89), although some studies found that comorbid mental disorders existed despite good control of seizures (89). Quality of life can be affected by a range of clinical and psychosocial factors. Jacoby et al. (199) have categorized these factors as epilepsy-related and not epilepsy-related. From the non-epilepsy-related factors, comorbid mental and physical disorders, stigma, resilience, self-efficacy and social support have all been identified as important (199). Even though both seizure frequency and comorbid mental disorders play a significant role in the quality of life, the findings of this study support the negative contribution of mental disorders upon quality of life irrespective of seizure control.

The lack of a prospective association between co-morbid CMD symptoms and change in quality of life (in the linear regression model) contrasted with the SEM finding of a significant summative effect of baseline CMD on quality of life at 6 months. The SEM complete case analysis did not find CMD to be associated either directly or indirectly (via seizure control) but sensitivity analysis with multiple imputation of missing data

indicated that CMD affected quality of life through the mediator of seizure frequency. Our study was likely to have been under-powered and affected by attrition bias which may mean the findings from the multiple imputation analysis are more valid. Cross-sectional analyses of the same cohort at baseline (104) and cross-sectional studies of the association in other LMIC settings (27) showed strong associations between CMD and QoL but are more susceptible to negative recall bias (200) than prospective studies and do not illuminate the potential mechanism of any association and, indeed, its temporal relationship. Furthermore, CMD symptoms may have been managed by PHC workers between baseline and follow-up, supported by the reduced total score of SRQ-20 over time, although there was no evidence of effect modification by treatment engagement.

The association of increased seizure frequency with poor quality of life is consistent with the results of studies from high income countries and from Africa (64, 102, 187). As quality of life measurement was also related to the subjective experience of being satisfied and fulfilled in life (201), the direct social and cultural effect of increased seizure frequency on their overall life could be the most troublesome problem for these participants. The SEM sensitivity analysis indicated that seizure frequency may mediate the association between CMD symptoms and quality of life and the direct association between CMD and seizure frequency was significant. Previous studies have shown that people with CMD symptoms are less likely to be seizure free (16, 202). Common mental health conditions like depression have been found to contribute to treatment resistance epilepsy (202), poor treatment adherence (203, 204) and increased anti-seizure medication side effects (15). Therefore, comorbid CMD symptoms could have directly

contributed to poor anti-seizure medication adherence and side effects which then affected achieving seizure control. Unfortunately, these factors (adherence and anti-seizure medication side effects) were not measured in our study which has limited our findings. We found that only half of the participants were seizure free at the end of the cohort rather than 70% which is expected for the first line treatment of GTC with anti-seizure medication (205). Beyond potential impacts of CMD symptoms, this may also reflect the scarcity and high cost of the alternative classes of anti-seizure medications in this low socio-economic status setting.

7.5.5. Association of comorbid mental health conditions/ CMD symptoms and functional disability in Ethiopia

Functional disability was found to be associated independently with comorbid mental disorders and seizure frequency on the cross-sectional analysis. These findings are similar to a study carried out in Canada (94). Co-morbid depression has been shown to be associated with the greatest decrement in the health status of an individual for a range of different chronic disorders, for example asthma and diabetes, compared to the chronic physical health condition alone (206).

For the outcome of functioning, there was also a discrepancy between findings from the linear regression and SEM. However, SEM provided strong evidence of a direct effect of co-morbid CMD symptoms on functional impairment. The global burden and disability associated with depression is substantial (207), compounding disability associated with the underlying chronic neurologic disorder (epilepsy). Meeting basic needs, like food and shelter, is often given highest value by people with chronic mental health conditions in the same setting (208). Therefore, being functional and thus better able to meet basic

needs could be more important than satisfaction with life and could explain the stronger prospective associations between CMD and functional disability compared to quality of life. The impact of seizure frequency on functional disability was also significant, in keeping with other studies (94, 209), but there was no evidence of CMD symptoms indirectly affecting functioning through seizure frequency similar to quality of life.

There was also significant association of epilepsy related stigma and CMD symptoms on the SEM analysis.

Risky alcohol use was not associated with change in quality of life or functioning. Levels of risky alcohol use were high at baseline, with 14.4% of people with epilepsy having high risk use of alcohol. This decreased substantially (to 1.7%) over the 6-month follow-up period and could explain why baseline risky alcohol use was not associated with either outcome. At baseline alcohol use could have been the primary cause of seizures (and/or epilepsy) or it could be comorbid with the epilepsy. Evidence from HIC indicated the higher prevalence of alcohol use in PWE compared to general population (14) and it's was associated with higher rate of mortality of PWE (210, 211).

7.5.6. The experience of mental –ill health in PWE in Ethiopia

The qualitative exploration of the experience with mental ill health has revealed that there was a range of emotional and physical difficulties that were very concerning for participants. Bodily manifestations were found to be inseparable from emotional and social difficulties. Strong emotions were feared, not only considered to be a significant cause of epilepsy but also a potent trigger for recurrent seizures after biomedical treatment had commenced. This conceptualisation of various emotional traits like fear and grief as triggers for the onset of epilepsy was also shared by other individuals with

epilepsy from LMICs (212). The way in which bodily sickness was interpreted and responded to comprised a unified conception of 'epilepsy', that included emotional, spiritual and social aspects, as well as seizures (213). In this way, the 'disease' of 'epilepsy' was socially constructed and given meaning which was in line with the bio-psychosocial and spiritual model of illness (213, 214). This holistic understanding is essential to inform the care needed by people with epilepsy, going beyond what can be provided by the health system in isolation.

The significance of relationship problems, social disparities and poverty in the development of emotional illness, including depression, accorded with the findings from the meta-synthesis of qualitative studies from sub-Saharan Africa (215). In the case of epilepsy, additional social and financial threats to mental wellbeing were reported in our study, arising from physical disability, the stigma-fuelled fear of having a seizure in a public place and anxiety linked to the dangers that could result from a seizure while working or alone.

7.6. Strength and limitations

The systematic review was comprehensive: we sought to include all eligible studies without any language restriction and covering the main databases with no restriction on date. But we only used English language terms to search the key domains and only searched in English language databases.

To best of my knowledge the entire project was was the first of its kind in Ethiopia or other low income setting to investigate the impact of comorbid mental health condition in people with epilepsy on quality of life and functional disability. It is also one of the few

studies carried out on detection of comorbid mental disorders in PWE by PHC workers in sub-Saharan Africa.

The use of key informants and health extension workers working at the community level for identification and referral of potential study participants helped to ensure representativeness of the sample and increase generalizability. We focused on patient-reported outcome measurement, rather than just clinical outcomes, which are important for wellbeing but often overlooked. The diagnosis of comorbid mental disorders was carried out by psychiatric nurses using a gold standard approach. The use of a clinical interview is particularly important in clinical populations where the illness or side effects of medication can lead to erroneously inflated scores on screening tools. There are few studies from sub-Saharan Africa that have used diagnostic verification of mental disorder (46). The inclusion and evaluation of three different diagnostic (PHC detetion, screening with SRQ-20 and OPCRIT+) methods simultaneously in routine clinical care was also one of the strengths of this project. This study was a pragmatic study which followed WHO mhGAP-IG criterion for evaluation of people with epilepsy thus increasing applicability for this setting.

This is also one of the few studies to explore the experience of people with epilepsy on their mental health in a rural setting. The credibility of the reports obtained was enhanced by giving the participants plenty of time to express their thoughts and feelings. We collected data until theoretical saturation was reached. The interviewers had a lot of experience in conducting qualitative data. We also clearly stated our position as a clinician and researcher and how this might influence participant responses and our analyses. We sought to engage in continuous reflection on our

presumptive belief about the relationship between mental health and epilepsy throughout the research process. The data gathered and presented was enriched as the participants were from different socio-demographic backgrounds and at different levels of their seizure control or their emotional difficulties. There were also more than two researchers involved in the coding and analysis of the data.

Though these were some of the strengths, the work presented in this PhD thesis also has some limitations. Even though the epilepsy definitions used by WHO's mhGAP and ILAE (International League Against Epilepsy) are similar, diagnostic tools like EEG were not used in this study. This limited the possibility of confirmatory diagnosis of focal seizures by the PHC workers. The limited clinical experience of PHC workers in managing mental or neurologic disorders before the implementation of mhGAP could also have underpinned low recognition of focal seizures. Even after the mhGAP training the diagnosis of focal seizures and non-epileptic seizures needs experience and EEG. A further limitation of this study was that antiepileptic medication side effects were not measured which could have been potential confounding factors. It is also possible that co-morbid anxiety disorders were under-diagnosed and/or categorised as depressive disorders by the clinician interviewers. The low detection of anxiety disorders in this study could also be due to the presentation of depression in Ethiopian culture which was often comprises a combination of anxiety, somatic and depressive symptoms rather than typical DSM criteria and the non-biomedical causal attributions of depressive/anxiety symptoms in this society (104). This could have biased the psychiatry nurses towards diagnosing depression rather than anxiety disorders in their clinical interviews.

Though the percentage of people who were lost to follow up was minimal (7%), there was evidence of selective attrition by people who had higher CMD symptoms at baseline and differences in the final result of the SEM between the complete and imputed data. This suggests potential selection bias which may have reduced the association between CMD symptoms and the outcomes considered in our analysis. We operationalized the definition of treatment engagement as the attendance of participants at the health center, considering this to be a good proxy measurement of help seeking due to the concerning health problems. Though treatment engagement is a complex and multi-dimensional construct (216), the attitudinal and behavioural component was not measured in this study. This could be one of the reasons for absence of significant effect modification by treatment engagement in the association between CMD symptoms with all the outcomes. The qualitative data gathered from this study reflects only those people with epilepsy living in a rural area of Ethiopia and who were able to access care from primary health care. Transferability of findings to more settings may be limited.

Finally, In this research project we have tried to keep all the principles of research ethics with especial emphasis on the equitable selection of participants. Those who lacked the capacity to analyse the research questions or the benefits or the risk of being part of the research were excluded in order to avoid any undue burden on these vulnerable groups of people.

7.7. Conclusion

Overall, co-morbid mental disorders were associated with poorer quality of life and functional impairment in PWE in this rural Ethiopian setting. Co-morbid CMD symptoms

and seizure frequency had independent negative impacts on functional disability. Seizure frequency also predicted poor quality of life and the sensitivity analyses indicated a possible mechanism linking CMD symptoms with poor quality of life through seizure frequency.

The detection of co-morbid mental disorders in people with epilepsy by PHC workers was low. The use of screening instruments augmented by the clinical skill of the PHC workers may possibly improve the detection of mental disorders but needs further evaluation. Adult people with epilepsy living in the rural parts of Ethiopia experienced multifaceted bio psychosocial and financial problems which are intertwined. These problems have significant consequences for their occupational and social functioning. Seizure controls, mental wellbeing, social support, maximal functioning with poverty reduction were highly regarded by people with epilepsy in this setting.

7.8. Recommendations

Clinical and public health implication

The ultimate treatment goal for PWE, whether they live in a high- or low-income country, is to have total control of of the seizure with minimal antiepileptic drug side effects, good quality of life and day-to-day functioning. The achievement of these goals will require a multidisciplinary approach, tackling physical health, mental health, poverty and stigma in an integrated fashion. At the health facility level, indicated screening for comorbid mental health conditions in PWE can lead to improved detection of mental disorders. Thus, healthcare professionals should not manage seizures alone, but must also be attentive to comorbid mental conditions. From the result of the second study it has also

been demonstrated that use of SRQ-20 screening augmented by clinical evaluation is promising strategy to increase detection of co-morbid CMD. This augmentation is seen by the high specificity of PHC workers which has compensated for the low specificity of SRQ-20. As people with epilepsy are a high risk population, the routine use of depression screening is highly recommended in HIC (193). It is also recommended that the ideal screening tool should be able to detect depression even when patients are presenting with somatic complaints (217). PHC workers knowing the common terms patients use for emotional symptoms and their relevance will help in identification of mental disorders (217). Our findings from the qualitative study in which participants emphasised the perceived role psychosocial and economic related events in relation to quality of life, mean that mental and social/economic problems cannot be neglected in comprehensive care of people with epilepsy. This has important implications for clinicians in the clinical care of individuals with epilepsy which should include integrated evaluation and management of both the psychological and physical distress, as well as responding to associated social and economic needs.

Policy implications

From the systematic review and meta-analysis and the cross-sectional analysis result (study 3), it is clear that the effect of depression on quality of life is substantial. The literature from the HICs has recognised this important fact for the last decade and has moved to increasing awareness of the need for early detection and strategies for effective management of depression and anxiety in people with epilepsy (15, 31).The detection strategies should also be planned and integrated within the scale-up of primary care-based mental health care in Ethiopia and similar settings. Training

programmes for PHC workers in LMICs, such as mhGAP, may benefit from more horizontally integrated diagnostic algorithms which facilitate detection of co-morbidity. Contextualisation using local expression of mental distress may also increase the impact on detection.

It is also necessary for policy makers to consider and implement people-centred care for epilepsy and other chronic health conditions within primary health care (218). People centred and integrated health services which are comprehensive tailored to the individual needs, co-ordinated across different health care providers, continuous and sustainable, and holistic in nature addressing the mental, physical and socioeconomic problems will be important for improving the quality of life of people with epilepsy (218).

Cost-effective psychosocial interventions delivered by non-mental health specialist could also be beneficial in management of common mental conditions (219). Addressing associated mental health conditions through effective psychosocial interventions (220, 221) can help to achieve optimal occupational and educational functioning. In addition, efficient poverty alleviation interventions may be needed in order to bring relief from the economic difficulties (222).

Therefore, people -centred care which is organised around the individual's needs, adopts the perspective of the families and communities, which empowers shared decision making and take into consideration of the psychosocial determinants of illness could be a way forward in effective management of epilepsy (218).

Availability and sustainability of access to effective anti-seizure medication in this rural community is also a prerequisite for better outcomes. The availability and sustainable

provision of not only the older anti-seizure medications but also the newly available anti-seizure medications will also have a tremendous role in achieving good control of seizure and later on quality of life and functioning.

Furthermore, interventions to address the impact of stigma should be planned and implemented. Stigma reduction programs and interventions at the community level against people with epilepsy are also highly recommended for increasing social inclusion but also minimizing the impact on mental health (223). Our findings suggest education about the cause, mode of transmission and treatment options to the general community could help to tackle stigma and lead to increased social integration in this community.

Research implications

Implementation of screening questionnaires for depression in routine PHC settings has yielded mixed results in high-income countries (224) , indicating the need for future studies to evaluate the effectiveness of introduction of routine screening in people with epilepsy in LMICs. The development, cultural adaptation and evaluation of the impact of symptom screening tools in routine settings is a promising avenue for future research. Future research with a larger sample size and longer periods of follow up are needed to clearly examine the association of comorbid mental health conditions and quality of life, including economic and social outcomes. Further community based longitudinal and intervention studies with larger sample size and in more diverse settings are recommended.

Overall, future interventions that address the various physical, emotional, social and financial adversities and which utilizes the available important resource (family support) should be adapted, implemented and possibly evaluated in this rural community.

Future researches tailored to people with comorbid neurodevelopmental disorders should be planned and excuted.

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Annexes

Appendix A - search terms for Pubmed

Table 1 search terms for PubMed

SN	Big terms	Free terms (Text words)	MESH terms	Result
1	Epilepsy	"Seizure disorders" OR seizure	Epilepsy	159290
2	Mental disorder	"psychiatric disorders" OR "common mental disorders" OR "mental distress" OR depression OR "depressive disorders" OR "affective disorders" OR "anxiety disorders" OR phobia OR "panic disorder" OR "social anxiety disorder" OR "somatic symptom disorder" OR "somatoform disorder" OR "illness anxiety" OR, Hypochondriasis OR psychosis OR "psychotic disorders" OR schizophrenia OR schizoaffective OR "delusional disorder" OR "brief psychotic disorder" OR schizophreniform	Mental disorders	1419841
3	LAMIC	Africa OR "Sub-Saharan Africa" OR "low income country" OR "middle income country" OR Afghanistan OR Albania OR Algeria OR "American Samoa" OR Angola OR Armenia OR Azerbaijan OR Bangladesh OR Belarus OR Belize OR Benin OR Bhutan OR Bolivia OR "Bosnia and Herzegovina" OR Botswana OR Brazil OR Bulgaria OR "Burkina Faso" OR Burundi OR "Cabo Verde" OR Cambodia OR Cameroon OR "Central African Republic" OR Chad OR China OR Colombia OR Comoros OR "Congo, Dem. Rep" OR "Congo, Rep." OR "Costa Rica" OR "Côte d'Ivoire" OR Cuba OR Djibouti OR Dominica OR "Dominican Republic" OR Ecuador OR "Egypt, Arab Rep." OR "El Salvador" OR Eritrea OR Ethiopia OR Fiji OR Gabon OR Gambia OR Georgia OR Ghana OR Grenada OR Guatemala OR Guinea OR "Guinea-Bissau" OR Guyana OR Haiti OR Honduras OR India OR Indonesia OR "Iran, Islamic Rep." OR Iraq OR Jamaica OR Jordan OR Kazakhstan OR Kenya OR Kiribati OR "Korea, Dem Rep." OR Kosovo OR "Kyrgyz Republic" OR "Lao PDR" OR Lebanon OR Lesotho OR Liberia OR Libya OR "Macedonia, FYR" OR Madagascar OR Malawi OR Malaysia OR Maldives OR Mali OR "Marshall Islands" OR Mauritania OR Mauritius OR Mexico OR "Micronesia, Fed. Sts." OR Moldova OR Mongolia OR Montenegro OR Morocco OR Mozambique OR Myanmar OR Namibia OR Nepal OR Nicaragua OR Niger OR Nigeria OR Pakistan OR Palau OR Panama OR "Papua New Guinea" OR Paraguay OR Peru OR Philippines OR Romania OR Rwanda OR		1261757

		Samoa OR “São Tomé AND Principe” OR Senegal OR Serbia OR “Sierra Leone” OR “Solomon Islands” OR Somalia OR “South Africa” OR “South Sudan” OR “Sri Lanka” OR “St. Lucia” OR “St. Vincent AND the Grenadines” OR Sudan OR Suriname OR Swaziland OR “Syrian Arab Republic” OR Tajikistan OR Tanzania OR Thailand OR Timor-Leste OR Togo OR Tonga OR Tunisia OR Turkey OR Turkmenistan OR Tuvalu OR Uganda OR Ukraine OR Uzbekistan OR Vanuatu OR Vietnam OR “West Bank AND Gaza” OR “Yemen, Rep.” OR Zambia OR Zimbabwe		
#1 AND #2				27312
	For objective 1			
#1 AND #2 AND #3	Search **(((((epilepsy[Title/Abstract]) OR (“Seizure disorders”[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR (“psychiatric disorders”[Text Word] OR “common mental disorders”[Text Word] OR depression[Text Word] OR “depressive disorders”[Text Word] OR “affective disorders”[Text Word] OR “anxiety disorders”[Text Word] OR phobia[Text Word] OR “panic disorder”[Text Word] OR “social anxiety disorder”[Text Word] OR “somatic symptom disorder”[Text Word] OR “somatoform disorder”[Text Word] OR “illness anxiety” OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR “psychotic disorders”[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR “delusional disorder”[Text Word] OR “brief psychotic disorder”[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])) AND ((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR “Sub-Saharan Africa”[Text Word] OR “low income country”[Text Word] OR “middle income country”[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR “American Samoa”[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR “Bosnia[Text Word] AND Herzegovina”[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR “Burkina Faso”[Text Word] OR Burundi[Text Word] OR “Cabo Verde”[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR “Central African Republic”[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR “Congo, Dem. Rep”[Text Word] OR “Congo, Rep.”[Text Word] OR “Costa Rica”[Text Word] OR “Côte d'Ivoire”[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR “Dominican Republic”[Text Word] OR Ecuador[Text Word] OR “Egypt, Arab Rep.”[Text Word] OR “El Salvador”[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR “Guinea-Bissau”[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR “Iran, Islamic Rep.”[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR “Korea, Dem Rep.”[Text Word] OR Kosovo[Text Word] OR “Kyrgyz Republic”[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text**			855

	Word] OR Libya[Text Word] OR "Macedonia, FYR"[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR "Marshall Islands"[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR "Micronesia, Fed. Sts."[Text Word] OR Moldova[Text Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR "Papua New Guinea"[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR "São Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word]))			
	OBJECTIVE 2			
4	Impact	Influence OR effect OR consequence OR result OR outcome OR significance	Seizure impact	6769912
#1AND #2AND#3 AND #4	Search **((((((impact[Title/Abstract]) OR (Influence[Text Word] OR effect[Text Word] OR consequence [Text Word] OR result[Text Word] OR outcome[Text Word] OR significance[Text Word])) OR impact seizure[MeSH Terms])) AND ((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR "Sub-Saharan Africa"[Text Word] OR "low income country"[Text Word] OR "middle income country"[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR "American Samoa"[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR "Bosnia[Text Word] AND Herzegovina"[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR "Burkina Faso"[Text Word] OR Burundi[Text Word] OR "Cabo Verde"[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR "Central African Republic"[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR "Congo, Dem. Rep"[Text Word] OR "Congo, Rep."[Text Word] OR "Costa Rica"[Text Word] OR "Côte d'Ivoire"[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR "Dominican Republic"[Text Word] OR Ecuador[Text Word] OR "Egypt, Arab Rep."[Text Word] OR "El Salvador"[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR "Guinea-Bissau"[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR**			244

	Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR "Iran, Islamic Rep."[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR "Korea, Dem Rep."[Text Word] OR Kosovo[Text Word] OR "Kyrgyz Republic"[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text Word] OR Libya[Text Word] OR "Macedonia, FYR"[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR "Marshall Islands"[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR "Micronesia, Fed. Sts."[Text Word] OR Moldova[Text Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR "Papua New Guinea"[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR "São Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word])))) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR ("psychiatric disorders"[Text Word] OR "common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR "illness anxiety" OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR "psychotic disorders"[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR "delusional disorder"[Text Word] OR "brief psychotic disorder"[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])		
5	Quality of life	satisfaction	Quality of life	447073
#1AND #2 AND#3 AND #5	Search **((((((("quality of life"[Title/Abstract]) OR satisfaction[Text Word]) OR quality of life[MeSH Terms])) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR ("psychiatric disorders"[Text Word] OR "common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR**			87

	"illness anxiety" OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR "psychotic disorders"[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR "delusional disorder"[Text Word] OR "brief psychotic disorder"[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])) AND (((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR "Sub-Saharan Africa"[Text Word] OR "low income country"[Text Word] OR "middle income country"[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR "American Samoa"[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR "Bosnia[Text Word] AND Herzegovina"[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR "Burkina Faso"[Text Word] OR Burundi[Text Word] OR "Cabo Verde"[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR "Central African Republic"[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR "Congo, Dem. Rep"[Text Word] OR "Congo, Rep."[Text Word] OR "Costa Rica"[Text Word] OR "Côte d'Ivoire"[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR "Dominican Republic"[Text Word] OR Ecuador[Text Word] OR "Egypt, Arab Rep."[Text Word] OR "El Salvador"[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR "Guinea-Bissau"[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR "Iran, Islamic Rep."[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR "Korea, Dem Rep."[Text Word] OR Kosovo[Text Word] OR "Kyrgyz Republic"[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text Word] OR Libya[Text Word] OR "Macedonia, FYR"[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR "Marshall Islands"[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR "Micronesia, Fed. Sts."[Text Word] OR Moldova[Text Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR "Papua New Guinea"[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR "São Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR	

	Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word]))			
6	Disability	"activities of daily living" OR rehabilitation OR capability OR work* OR employment OR relationship OR function*	People with disability	6276644
#1 AND #2 AND #3 AND #6	Search **((((((disability[Title/Abstract]) OR ("activities of daily living"[Text Word] OR rehabilitation[Text Word] OR capability[Text Word] OR work*[Text Word] OR employment[Text Word] OR relationship[Text Word] OR function*[Text Word])) OR disabilities, people with[MeSH Terms])) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR ("psychiatric disorders"[Text Word] OR "common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR "illness anxiety" OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR "psychotic disorders"[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR "delusional disorder"[Text Word] OR "brief psychotic disorder"[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])) AND ((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR "Sub-Saharan Africa"[Text Word] OR "low income country"[Text Word] OR "middle income country"[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR "American Samoa"[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR "Bosnia[Text Word] AND Herzegovina"[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR "Burkina Faso"[Text Word] OR Burundi[Text Word] OR "Cabo Verde"[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR "Central African Republic"[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR "Congo, Dem. Rep"[Text Word] OR "Congo, Rep."[Text Word] OR "Costa Rica"[Text Word] OR "Côte d'Ivoire"[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR "Dominican Republic"[Text Word] OR Ecuador[Text Word] OR "Egypt, Arab Rep."[Text Word] OR "El Salvador"[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR "Guinea-Bissau"[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR "Iran, Islamic Rep."[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR "Korea, Dem Rep."[Text Word] OR Kosovo[Text Word] OR "Kyrgyz Republic"[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text Word] OR Libya[Text Word] OR "Macedonia, FYR"[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR "Marshall Islands"[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR "Micronesia, Fed. Sts."[Text Word] OR Moldova[Text**			275

	Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR "Papua New Guinea"[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR "São Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word]))			
7	Treatment adherence	Engagement OR "follow up"	Medication adherence	1269675
#1 AND #2 AND#3 AND#7	Search **((((((Treatment adherence[Title/Abstract]) OR (Engagement[Text Word] OR "follow up"[Text Word])) OR adherence, medication[MeSH Terms])) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR ("psychiatric disorders"[Text Word] OR "common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR "illness anxiety" OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR "psychotic disorders"[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR "delusional disorder"[Text Word] OR "brief psychotic disorder"[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])) AND ((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR "Sub-Saharan Africa"[Text Word] OR "low income country"[Text Word] OR "middle income country"[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR "American Samoa"[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR "Bosnia[Text Word] AND Herzegovina"[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR "Burkina Faso"[Text Word] OR Burundi[Text Word] OR "Cabo Verde"[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR "Central African Republic"[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR "Congo, Dem. Rep"[Text Word] OR "Congo, Rep."[Text Word] OR "Costa Rica"[Text Word] OR "Côte d'Ivoire"[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR "Dominican Republic"[Text Word] OR Ecuador[Text Word] OR "Egypt, Arab Rep."[Text Word] OR "El**			441

	Salvador"[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR "Guinea-Bissau"[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR "Iran, Islamic Rep."[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR "Korea, Dem Rep."[Text Word] OR Kosovo[Text Word] OR "Kyrgyz Republic"[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text Word] OR Libya[Text Word] OR "Macedonia, FYR"[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR "Marshall Islands"[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR "Micronesia, Fed. Sts."[Text Word] OR Moldova[Text Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR "Papua New Guinea"[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR "São Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word]))			
	OBJECTIVE 3			
8	Common mental disorders	"common mental disorders" OR "mental distress" OR depression OR "depressive disorders" OR "affective disorders" OR "anxiety disorders" OR phobia OR "panic disorder" OR "social anxiety disorder" OR "somatic symptom disorder" OR "somatoform disorder" OR "illness anxiety" OR, Hypochondriasis		413055
9	Detect*	Recogn* OR Detect* OR Screen* OR Discover* OR Assess* OR diagnosis		
#1 AND #2 AND #3 AND #8 AND #9	Search **((((((detect*[Title/Abstract]) OR (Recogn*[Text Word] OR Detect*[Text Word] OR Screen*[Text Word] OR Discover*[Text Word] OR Assess*[Text Word] OR diagnosis[Text Word])))) AND (("common mental disorders"[Title/Abstract]) OR ("common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text**			170

	Word] OR “panic disorder”[Text Word] OR “social anxiety disorder”[Text Word] OR “somatic symptom disorder”[Text Word] OR “somatoform disorder”[Text Word] OR “illness anxiety” OR, Hypochondriasis[Text Word]))) AND (((epilepsy[Title/Abstract]) OR (“Seizure disorders”[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])) AND ((("mental disorders"[Title/Abstract]) OR (“psychiatric disorders”[Text Word] OR “common mental disorders”[Text Word] OR depression[Text Word] OR “depressive disorders”[Text Word] OR “affective disorders”[Text Word] OR “anxiety disorders”[Text Word] OR phobia[Text Word] OR “panic disorder”[Text Word] OR “social anxiety disorder”[Text Word] OR “somatic symptom disorder”[Text Word] OR “somatoform disorder”[Text Word] OR “illness anxiety” OR, Hypochondriasis[Text Word] OR psychosis[Text Word] OR “psychotic disorders”[Text Word] OR schizophrenia[Text Word] OR schizoaffective[Text Word] OR “delusional disorder”[Text Word] OR “brief psychotic disorder”[Text Word] OR schizophreniform[Text Word])) OR mental disorders[MeSH Terms])) AND ((("low[Title/Abstract] AND middle income countr*"[Title/Abstract])) OR (Africa[Text Word] OR “Sub-Saharan Africa”[Text Word] OR “low income country”[Text Word] OR “middle income country”[Text Word] OR Afghanistan[Text Word] OR Albania[Text Word] OR Algeria[Text Word] OR “American Samoa”[Text Word] OR Angola[Text Word] OR Armenia[Text Word] OR Azerbaijan[Text Word] OR Bangladesh[Text Word] OR Belarus[Text Word] OR Belize[Text Word] OR Benin[Text Word] OR Bhutan[Text Word] OR Bolivia[Text Word] OR “Bosnia[Text Word] AND Herzegovina”[Text Word] OR Botswana[Text Word] OR Brazil[Text Word] OR Bulgaria[Text Word] OR “Burkina Faso”[Text Word] OR Burundi[Text Word] OR “Cabo Verde”[Text Word] OR Cambodia[Text Word] OR Cameroon[Text Word] OR “Central African Republic”[Text Word] OR Chad[Text Word] OR China[Text Word] OR Colombia[Text Word] OR Comoros[Text Word] OR “Congo, Dem. Rep”[Text Word] OR “Congo, Rep.”[Text Word] OR “Costa Rica”[Text Word] OR “Côte d'Ivoire”[Text Word] OR Cuba[Text Word] OR Djibouti[Text Word] OR Dominica[Text Word] OR “Dominican Republic”[Text Word] OR Ecuador[Text Word] OR “Egypt, Arab Rep.”[Text Word] OR “El Salvador”[Text Word] OR Eritrea[Text Word] OR Ethiopia[Text Word] OR Fiji[Text Word] OR Gabon[Text Word] OR Gambia[Text Word] OR Georgia[Text Word] OR Ghana[Text Word] OR Grenada[Text Word] OR Guatemala[Text Word] OR Guinea[Text Word] OR “Guinea-Bissau”[Text Word] OR Guyana[Text Word] OR Haiti[Text Word] OR Honduras[Text Word] OR India[Text Word] OR Indonesia[Text Word] OR “Iran, Islamic Rep.”[Text Word] OR Iraq[Text Word] OR Jamaica[Text Word] OR Jordan[Text Word] OR Kazakhstan[Text Word] OR Kenya[Text Word] OR Kiribati[Text Word] OR “Korea, Dem Rep.”[Text Word] OR Kosovo[Text Word] OR “Kyrgyz Republic”[Text Word] OR "Lao PDR"[Text Word] OR Lebanon[Text Word] OR Lesotho[Text Word] OR Liberia[Text Word] OR Libya[Text Word] OR “Macedonia, FYR”[Text Word] OR Madagascar[Text Word] OR Malawi[Text Word] OR Malaysia[Text Word] OR Maldives[Text Word] OR Mali[Text Word] OR “Marshall Islands”[Text Word] OR Mauritania[Text Word] OR Mauritius[Text Word] OR Mexico[Text Word] OR “Micronesia, Fed. Sts."[Text Word] OR Moldova[Text Word] OR Mongolia[Text Word] OR Montenegro[Text Word] OR Morocco [Text Word] OR Mozambique[Text Word] OR Myanmar[Text Word] OR Namibia[Text Word] OR Nepal[Text Word] OR Nicaragua[Text Word] OR Niger[Text Word] OR Nigeria[Text Word] OR Pakistan[Text Word] OR Palau[Text Word] OR Panama[Text Word] OR “Papua New Guinea”[Text Word] OR Paraguay[Text Word] OR Peru[Text Word] OR Philippines[Text Word] OR Romania[Text Word] OR Rwanda[Text Word] OR Samoa[Text Word] OR “São	

	Tomé[Text Word] AND Principe"[Text Word] OR Senegal[Text Word] OR Serbia[Text Word] OR "Sierra Leone"[Text Word] OR "Solomon Islands"[Text Word] OR Somalia [Text Word] OR "South Africa"[Text Word] OR "South Sudan"[Text Word] OR "Sri Lanka"[Text Word] OR "St. Lucia"[Text Word] OR "St. Vincent [Text Word] AND the Grenadines"[Text Word] OR Sudan[Text Word] OR Suriname[Text Word] OR Swaziland[Text Word] OR "Syrian Arab Republic"[Text Word] OR Tajikistan [Text Word] OR Tanzania[Text Word] OR Thailand[Text Word] OR Timor-Leste[Text Word] OR Togo[Text Word] OR Tonga[Text Word] OR Tunisia[Text Word] OR Turkey[Text Word] OR Turkmenistan[Text Word] OR Tuvalu[Text Word] OR Uganda[Text Word] OR Ukraine[Text Word] OR Uzbekistan[Text Word] OR Vanuatu[Text Word] OR Vietnam[Text Word] OR "West Bank[Text Word] AND Gaza"[Text Word] OR "Yemen, Rep."[Text Word] OR Zambia[Text Word] OR Zimbabwe[Text Word]))			
	OBJECTIVE 4			
10	Validat*	Adapt* OR evaluat* OR develop*	Validation studies	7731394
#1 AND #3 AND#8 AND #10	Search **((((Validat*) OR (Adapt*[Text Word] OR evaluat*[Text Word] OR develop*[Text Word]))) AND (("common mental disorders"[Title/Abstract]) OR ("common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR "illness anxiety" OR, Hypochondriasis[Text Word]))) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])……**			154
11	Psychometric property	Reliability OR validity OR validation OR Psychometr* OR "Psychometric Propert*" OR efficacy OR effectiveness	psychometrics	
#1 AND #3 AND #8 AND #11	Search **(((((("psychometeric properties"[Title/Abstract]) OR (Reliability[Text Word] OR validity[Text Word] OR validation[Text Word] OR Psychometr*[Text Word] OR "Psychometric Propert*"[Text Word] OR efficacy[Text Word] OR effectiveness[Text Word])) OR psychometrics[MeSH Terms])) AND (("common mental disorders"[Title/Abstract]) OR ("common mental disorders"[Text Word] OR depression[Text Word] OR "depressive disorders"[Text Word] OR "affective disorders"[Text Word] OR "anxiety disorders"[Text Word] OR phobia[Text Word] OR "panic disorder"[Text Word] OR "social anxiety disorder"[Text Word] OR "somatic symptom disorder"[Text Word] OR "somatoform disorder"[Text Word] OR "illness anxiety" OR, Hypochondriasis[Text Word]))) AND (((epilepsy[Title/Abstract]) OR ("Seizure disorders"[Text Word] OR seizure[Text Word])) OR epilepsy[MeSH Terms])…***LAMIC*…**			119

Appendix B (1) Information sheet (English version)

Detection and impact of co-morbid mental disorders in people with epilepsy in rural Ethiopia

We would like to invite you to participate in this research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.This study is being funded by the Welcome trust and the study is being conducted by Addis Ababa University.

- **Aims of the research**

This study is looking at how common mental disorders are in people with epilepsy, the impact of having comorbid mental disorder with epilepsy, as well as looking at how well primary care workers identify mental disorders and give the correct treatment for people with epilepsy**.**

- **Who are we recruiting?**

We will be interviewing people who suffer from mental illness.

- **What will happen if you agree to take part?**

One of our data collectors will either come to your place of work or your home and ask you some questions. The questions will be asking about your quality of life, seizure control, medication adherence, disability, feelings and emotions and stigma related to the illness. The interview will take about one hour. After six months, we will carry out another interview which will cover the same topics. Again, this interview will be carried out in your home or at a place that is convenient for you. This second interview will take about one hour.For a small number of people we would also like to carry out a more detailed interviews to find out their experiences. If you are selected for this detailed interview, we will audiorecord the interview if you give us permission or we will take notes about what you tell us.

- **Risks of being in the study**

We don't expect that the interview will cause you any difficulties. On rare occasions, people might be upset by the questions that are being asked. If you are distressed by the questions then you do not have to answer the question and the interview can be stopped.

- **Possible benefits**

We hope that the information obtained will help to improve mental health services in Ethiopia and other similar countries. Once the study is completed, we will let you know what we found, either by inviting you to a meeting or giving you a leaflet.

- **What we will do with your data**

The questionnaires will not include your name so nobody except the reserch co- ordinator and project data managers will know that the information belongs to you.We will keep the questionnaires in a locked cupboard.After the end of this study, the information you tell us may be used by other researchers, but they will not be able to identify you in any way.

Main researchers: Dr Ruth Tsigebrhan, Dr Abebaw Fekadu and Dr Charlotte Hanlon.

You can contact us at the Butajira project office office from Monday to Friday during working hours or telephone our Addis Ababa research office (0112 753464).
It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason.

If this study has harmed you in any way you can contact the Institutional Review Board, Addis Ababa University, using the details below for further advice and information: Institutional Review Board, School of Medicine, Addis Ababa University

Telephone number: 0115-5538734

- You may withdraw your data from the research at any time up until it is transcribed for use in the final report.
- If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

Appendix B (2): Information sheet (Amaharic version)

ለጥናት ተሳታፊዎች የሚሰጥ መረጃ

የሚጥል ህመም እና አዕምሮ ሕመም ያላቸውን ቁርኝት እና ስነ-አእምሮ ህመም በሚጥለው ተፅኖን ለመገምገም የሚካሄድ ጥናት)

በዚህ ጥናት እንዲሳተፉ ተጋብዘዋል፡፡ ተሳትፎዎትም በእርሰዎ ፍላጎት ላይ ብቻ የተመሰረት ይሆናል፡፡ በጥናቱ ላለመሳተፍ ከመረጡ/ከወሰኑ አለመሳተፈዎት በእርሰዎ ላይ ምንም የሚያስከትለው ችግር የለም፡፡ በጥናቱ ለመሳተፍ ከመወሰንዎ በፊት ጥናቱ ለምን እንደሚሰራና የእርስዎ ተሳትፎ ምን እንደሚያካትት መረዳቱ አስፈላጊ ነው፡፡ እባክዎ ከዚህ በታች የተሰጡ መረጃዎችን በጥንቃቄ ያዳምጡ/ያንብቡ ካስፈለገዎ ከሌላ ሰው ጋር መነጋገረ ይችላሉ፡፡ ግልጽ ያልሆነ ነገር ካለና የበለጠ መረጃ ከፈለጉ ሊጠይቁን ይችላሉ፡፡ይህ ጥናት የገንዘብ ድጋፍ ያገኘው ዌልካም ትረስት ነው፡፡
ይህ ጥናት በኢ.አ ዩኒቨርሲቲ ስር በሚሰሩ ተመራማሪዎች የሚካሄድ ነው፡፡

የምርምሩ አላማ

ይህ ጥናት የሚጥል በሽታ የሚሰቃዩ፣ ሰዎች ምን ያህል የስነ-አዕምሮ ሕመም እንዳለባቸው ፣ የስነ-አዕምሮ ሕመሙ ከሚጥለው ህመም ጋር ያለው ተፅእኖ እንዲሁም የመጀመሪያ ጤና ባለሙያዎች የስነ-አዕምሮ ሕመም እንዴት እንደሚለዩት እና የሚያስፈልገውን ህክምና እንዴት እንደሚሰጡ የሚመለከት የማህበረሰብ የዳሰሳ ጥናት ነው፡፡

በጥናቱ እንዲሳተፉ የሚመረጡት እነ ማን ናቸው?

በጥናቱ ላይ እንዲሳተፉ የተመረጡት የሚጥል ህመም ያለባቸውን ሰዎች ይካተታሉ፡፡

በጥናቱ ለመሳተፍ ቢስማሙ ምን ይደረጋል?

ከመረጃ ሰብሳቢዎቻችን አንዱ በቤትዎ ወይም በስራ ቦታዎ ጥያቄዎችን ያቀርብሎታል፡፡ ቃለ መጠይቁ ወደ ስልሳ ደቂቃ ገደማ ይወስዳል፡፡ ቃለ መጠይቁ ስለዐአእምሮ ህመም የኑሮ አወንታዊነት ስለ የሚጥል ህመም ቁጥጥር የመድሃኒት በትክክል መውሰድን በህመሙ ምክንያት የሚፈጠሩ ተፅኖዎችን ስለ ስሜትዎ እና ስለማድላት መድልዎን ይመለከታል፡፡ እንዲሁም ተመሳሳይ ጥያቄዎችን ከስድስት ወር በህዋላ ከቤትዎ ወይም እርስዎ የሚመች ቦታ እንጠይቆታለን፡፡ ቃለ መጠይቁም አንድ ሰአት ወይም ስልሳ ደቂቃ ገደማ ይወስዳል፡፡ጥቂት ለሆኑ ሰዎችም ስለ ህይወታቸው ልምድ የሚጠይቅ ሰፋ ያሉ ጥያቄዎችን እናቀርባለን፡፡በዚህ ቃለመጥይቅ ከተሳተፉ እርስዎ ፈቃድ ጠይቀን ከፈቀዱልን ድምፅ የምንቀርፅ ሲሆን ወይም በፅሁፍ መልክቱን እንፅፋለን፡፡

በጥናቱ መሳተፍ ምን ጉዳት ይኖረዋል?

በቃለመጠይቁ መሳተፍ የሚያስከትለው ችግር የለም፡፡ቢሆንም አንዳንድ ሰዎች በሚነሱ ጥያቄዎች ሊረበሹ ይችሉ ይሆናል፡፡ እርስዎ በጥያቄዎቹ ደስተኛ ካልሆኑ መልስ ይሰጡ ዘንድ አይገደዱም፡፡ ቃለ መጠይቁም እዚሁ ላይ መቆም ይችላል፡፡፣

ጥናቱ የሚኖረው ጥቅም

የሚገኘው መረጃ በኢትዮጵያም ሆነ በሌሎች ሀገሮች ያለውን የአእምሮ ጤና አገልግሎት እንደሚያሻሽለው ተስፋ እናደረጋለን፡፡ ጥናቱ ሲጠናቀቅ ግኝታችንን ለማወቅ ይችሉ ዘንድ በስብሰባ ወይም በአፍዞር ፅሁፍ እንዲገለጽ እናደርጋለን፡፡

በሰጡን መረጃ ምን እናደርግበታለን?

ጥያቄዎቹ የእርስዎን ስም እንዲሁም ማንነት አያካትቱም፡፡ ስለዚህ ከጥናቱ አስተባባሪዎች ዶ/ር አባባው ፈቃዱ እና ዶ/ር ሩት ፅጌብርሃን እና የጥናቱ የመረጃ ሰራተኞች ውጪ ማንም ሌላ ሰው መረጃው የእርስዎ ስለመሆኑ የሚያውቀው አይኖርም ፡ የመረጃ ሰነዶቹን በሚቆለፉ መሳቢያ / መደርደርያ / እናስቀምጣለን፡፡ከጥናቱ ማለቅ በኋላ የሰጡን መረጃ ሌሎች ተመራማሪዎች ይጠቀሙበት ይሆናል፡፡ ግን በማንኛውም መንገድ መረጃ የሰጠውን ሰው መለየት እንዳይችሉ ይደረጋል፡፡

ዋና አጥኚዎች

ዶ/ር ሩት ፅጌብርሃን ዶ/ር አበባው ፈቃዱ እና ዶ/ር ሻርሌት ሀንሎን ፡፡ ሊያገኙን ከፈለጉ የቡታጅራ ፕሮጀክት ቢሮ ስልክ ቁጥር 046 115 15 95 በመጠቀም በስራ ቀኖች በሥራ ሰአት ሊደውሉልን ይችላሉ፡፡
በጥናቱ መሳተፍ የእርስዎ ውሳኔ ጉዳይ ይሆናል፡፡ በጥናቱ ለመሳተፍ ከወሰኑ በማንኛውም ሰአት ምክንያት መስጠት ሳይጠበቅብዎት በነጻነት ተሳትፎውን ማቋረጥ ይችላሉ፡፡
ይህ ጥናት በማንኛውም መንገድ ጉዳት ካደረሰብዎት የአዲስ አበባ ዩኒቨርሲቲ የህክምና ፋኩልቲ የስነምግባር (ኢቲክስ) ተቋማዊ የክለሳ ቦርድን ከዚህ በታች በተጠቀሰው አድራሻ ማነጋገር ይችላሉ፡፡
- ስልክ ቁጥር 0115-553 87 34

ማስታወሻ

- ✓ ወደ መጨረሻ ሪፖርትነት እስኪቀየር ድረስ በፈለጉት ሰአት መረጃዎን ከጥናቱ ሊያወጡ ይችላሉ፡፡
- ✓ በጥናቱ ለመሳተፍ ከወሰኑ ይህን የመረጃ ቅጽ ይሰጥዎትና ስምምነት ግን በፊርማ እንዲያረጋግጡ ይጠየቃሉ፡፡

Appendix C (1)consent form (English version)

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: Detection and impact of co-morbid mental disorders in people with epilepsy in rural Ethiopia.
Thank you for considering taking part in this research. The person organizing the research must explain the research to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

	Please tick or initial to show agreement
• **I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up until they are analysed (August 2016 for the first interview, March 2017 for the second interview) .**	☐
• **I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the national data protection rules.**	☐
• **The information you have submitted will be published as a report. Please note that confidentiality and anonymity will be maintained and it will not be possible to identify you from any publications.**	☐
• **I agree that the research team may use anonymized data for future research.**	☐

<u>Statement of Consent</u>

I have read the participant information sheet or had it read for me. All my questions have been answered. I have read or been told about the purpose and safety of the study, what will be done and the risks and benefits of the study. I agree to be in the study.

_____ _____

Name of participant Signature Date

(thumbprint)*

***in case the participant is not able to read this form or sign their name, this attests that the consent form has been read and explained accurately by a member of the research staff in the presence of an independent witness, and that the participant has affixed their thumbprint as a consent.**

Statement of an independent witness

I _____

agree that the research project named above has been explained to _____ (participant) to his/her satisfaction. Both the notes written above and the Information Sheet about the project have been read to him/her.

Signed Date

Investigator's Statement:

I _____ confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Appendix C (2) Consent form (Amaharic version)

የፈቃደኝነት መጠየቅያ ቅጽ

የመረጃ ወረቀቱን ካነበቡ እና ወይም ስለምርምሩ የተሰጠውን መግለጫ ካዳመጡ/ካነበቡ በኋላ እባክዎን ይህን የፈቃደኝነት መጠየቅያ ቅጽ ይሙሉ፡፡

የጥናቱ ርእስ ተደራቢ አዕምሮ ሕመም የሚጥል ህመም ባልባቸው ሰዎች ላይ ያለውን ቁርኝት እና ስነ-አእምሮ ህመም በሚጥለው ተዕኖን ለመገምገም የሚካሄድ ጥናት

በዚህ ጥናት ለመሳተፍ በማሰብዎ እናመሰግናለን፡፡ ጥናቱ ላይ ለመሳተፍ ከመስማማትዎ በፊት ይሄን ጥናት የሚያቀናጀው ሰው ስለ ጥናቱ በደንብ ገለፃ ማድረግ አለበት፡፡ እባክዎ ከመረጃው ወረቀት ወይም ከተደረገልዎት ገለጻ የመነጨ ጥያቄ ካለዎት በምርምሩ ለመሳተፍ ከመወሰንዎ በፊት መጠይቁን የሚያካሂደውን ግለሰብ ይጠይቁ፣ በእጅዎ ይኖር ዘንድ እና በፈለጉ ጊዜ እንዲያመሳክሩበት የዚህ የስምምነት ቅጽ ግልባጭ ይሰጥዎታል፡፡

- በማንኛውም ጊዜ በምርምሩ ላለመሳተፍ ከወሰንኩኝ፣ ለምርምሩ ለሚያካሂዱት ወይም ወኪሎቻቸው ማሳወቅ እንደምችልና ምንም ምክንያት ሳላቀርብ ከምርምሩ እራሴን ላገል እንደምችል ተረድቻለሁ፡፡ ከዚህም ባሻገር ጥናቱ እስኪታተም ድረስ የሰጠሁትን ቅጽ መረጃዎች ማውጣት እንደምችል ተረድቻለሁ፡፡ ☐
- የሰጠሁት የግል መረጃ ለተገለፀልኝ አላማ ጥቅም ላይ ይውል ዘንድ ተስማምቻለሁ፡፡ የዚህ አይነቱ መረጃም በሀገራቱ መረጃ ደህንነት ደንብ/ህግ መሰረት እንደሚያዝ ተገንዝቤአለሁ፡፡ ☐
- የሰጡን መረጃ እንደ ሪፖርት ይታተማል፡፡ የሚሰጡን መረጃ ሚስጥራዊነት እንደሚጠበቅና ከሚወጡትም ሪፖርቶች ማንነቶን ለማወቅ እንደማይቻል ልናረጋግጥ እንወዳለን፡፡ ☐
- የምርመራ ቡድኑ ቅድመ መረጃውን ለወደፊት ምርምር ሊጠቀም እንደሚችል እስማማለሁ፡፡ ☐

የተሳታፊው መግለጫ_____

እኔ _____
_____

ከላይ የተጠቀሰው የምርምር ጥናት በበቂ ሁኔታ ተብራርቶልኝ በጥናቱ ለመሳተፍ ተስማምቻለሁ፡፡ ከላይ የተጻፉትን ማሳሰቢያዎች እና ስለፕሮጀክቱ የሚገልጽ የመረጃ ወረቀት አንብቤ እና ስለ ጥናቱ ገለፃ ተደርጎልኝ ጥናቱ የሚያካትተውን በጠቅላላ ተረድቻለሁ፡፡ ጥያቄዎቼም ሁሉ ተመልሰውልኛል ፡፡

ፊርማ _____ ቀን _____

የምስክር ቃል (ተሳታፊው ያልተማረ ከሆነ)

እኔ_____
_____

ከላይ የተጠቀሰው የምርምር ፕሮጀክት በበቂ ሁኔታ ለ _____ ተብራርቶላቸው በምርምሩ ለመሳተፍ ተስማምተዋል፡፡ ከላይ የተጻፉ ማሳሰቢያዎች እና ስለፕሮጀክቱ የሚገልጽ የመረጃ ወረቀት የተነበባላቸው ሲሆን ጥናቱ የሚያካትታቸውንም ጉዳዮች ተረድተዋል፡፡

ፊርማ _____ ቀን _____

<u>የቃለ መጠይቅ አቅራቢ ቃል፡-</u>

እኔ_____ የጥናቱን ምንነት፣ የሚፈልጋቸውን ነገሮችና በጥናቱ መሳተፍ ሊያከትል የሚችለውን ችግር (አግባብ ካለው) የሚችለውን ጉዳዮች(አስፈላጊ ሲሆን) ለተሳታፊው በጥንቃቄ አብራርቻለሁ፡፡

Appendix D (1) Baseline lay interviewer administered questionnaire (English version)

Brief participants ID

Date [ ] [ ] [ ]

Interviewer's ID [ ] [ ] [ ]

Interviewee's ID [ ] [ ] [ ]

Section 1. Socio-demographic Information				
101	Participants card No (fill it by looking at the participants card)			PCNO
102	Sex (fill it by looking the sex of the participant)	Male	0	SEX
		Female	1	
103	**Age (How old are you?)**	[ ] [ ]		AGE
104	**Living place (where do you live, in urban or rural kebele?)**	Urban	0	RES
		Rural	1	
105	**Which Kebele are you living?**			KEBL
106	For how long did you live in your kebele?	**[ ][ ] year** **[ ][ ] month**		RESDUR
107	Educational background (What is the highest level of education you have completed?)	Illiterate	1	EDU
		Can read and write but didn't attend formal education (e.g learn at church or mosque or got non formal basic education)	2	
		Attend formal education	3	
108	If you attend formal education, up to what grade/ level did you learn?	**[ ][ ] year**		EDUYR
109	Occupation (what is your work from which you get your income or how spend your day)	Farming	1	EMP
		Private organization employee	2	
		Self-employed	3	
		Volunteer	4	
		House wife	5	
		Unemployed	6	
		Student	7	
		Pensioner	8	
		Government employee	9	
		Daily laborer	10	
		Other (please specify)	77	
110	How would you express your family's current income or life?	Very low	1	REINC
		Lower	2	
		Middle	3	
		Higher	4	
		Very high	5	

\f111	Marital status (What is your current marital status?	Single	1	MARIT
		Married	2	
		Divorced	3	
		Widowed	4	
		Married but not living together	5	
		Cohabitating	6	
112	Religion (what is your religion?)	Orthodox Christian	1	RELIG
		Muslim	2	
		Protestant	3	
		If other [specify]	4	
113	Ethnicity (what is your ethnicity?)	Gurage	1	ETHINIC
		Oromo	2	
		Amahra	3	
		If other [specify]	4	
114	How many people, including yourself, are there in your household?	[ ] [ ]		FAMZ
115	How long does it take you to get to the nearest health center?	[ ] [ ] minutes		DFHS

Epilepsy related factors

116	Did you ever have a previous treatment for epilepsy from a medical facility?	No	0	TXLTB
		Yes	1	
117	How long did it take you to attend a health facility and taking medication after the onset of the epilepsy?	[ ] days [ ] months [ ] years		DUPB
118	How old were you when you had first medical treatment?	[ ] [ ] years		TXAGEFB
119	How old were you when you had the illness? (onset of illness)	[ ] [ ] years		TONSET

2- Self Reported Questionnaire (SRQ-20)

SRQ-20

Please read the entire introduction before you fill in the questionnaire. It is very important that everyone taking the questionnaire follows the same instructions.

The following questions are related to certain pains and problems that may have bothered you in the last **30 days**. If you think the questions applies to you and you had the described problem in the past **30 days**, answer YES.

On other hand, if the question doesn't apply to you and you did not have the problem in the past 30 days, answer NO.

Please do not discuss the questions with anyone while answering the questionnaire.

If you are unsure about how to answer a question, please give the best answer you can.

We would like to reassure that the answers you are going to provide here are confidential.

201	Do you often have headaches?	Yes	1	SRHA
		No	0	
202	Is your appetite poor?	Yes	1	SRAP
		No	0	
203	Do you sleep badly?	Yes	1	SRIS
		No	0	
204	Are you easily frightened?	Yes	1	SRFR
		No	0	
205	Do your hands shake?	Yes	1	SRTR
		No	0	
206	Do you feel nervous, tense or worried?	Yes	1	SRWO
		No	0	
207	Is your digestion poor?	Yes	1	ERID
		NO	0	
208	Do you have trouble thinking clearly?	Yes	1	SRDT
		No	0	
209	Do you feel unhappy?	Yes	1	SRSA
		No	0	
210	Do you cry more than the usual?	Yes	1	SRWC
		No	0	
211	Do you find it difficult to enjoy your daily activities?	Yes	1	SRLH
		No	0	
212	Do you find it difficult to make decisions?	Yes	1	SRPDM
		No	0	
213	Is your daily work suffering?	Yes	1	SRDFW
		No	0	
214	Are you unable to play useful part in your life?	Yes	1	SRSCO
		No	0	
215	Have you lost interest in things?	Yes	1	SRWS
		No	0	

216	Do you feel that you are a worthless person?	Yes	1	SRFWL
		No	0	
217	Has the thought of ending your life been on your mind?	Yes	1	SRWTD
		No	0	
218	Do you feel tired all the time?	Yes	1	SRFTIR
		No	0	
219	Do you uncomfortable feeling in your stomach?	Yes	1	SRFDIS
		NO	0	
220	Do you get easily tired?	Yes	1	SREGR
		No	0	

5. Epilepsy quality of life

Patient weighted quality of life in Epilepsy:

QOLIE-10-P

Today's Date _____ /_____/_____ Mm dd yy	Your Name_____ Your Age: _____ _____ years

INSTRUCTIONS

The QOLIE-10-P is a brief survey of health-related quality of life for adults with epilepsy. (Adolescents (ages 11-17 years) should complete the QOLIE-AD-48, designed for that age group.) There are 10 questions about health and daily activities, one question about how much distress you feel about problems and worries related to epilepsy, and review of what bothers you most. These questionnaires should be completed only by the person who has epilepsy (not a relative or friend) because no one else knows how YOU feel.

Answer every question by circling the appropriate number (1,2,3…). If you are unsure about how to answer a question, please give the best answer you can and write a comment or explanation on the

These questions are about how you have been FEELING and the types of problems you have been having during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

This copy of the QOLIE-10-P is provided by www.epilepsy.com your source for epilepsy information, and the QOLIE Development Group. We wish you success in living your life with epilepsy!

2. Have you felt downhearted and low?	All of the time	**1**	**DOWN**
	Most of the time	**2**	
	A good bit of the time	**3**	
	Some of the time	**4**	
	A little off the time	**5**	
	None of the time	**6**	
3. How much of the time during the past 4 weeks your epilepsy or antiepileptic drugs have caused trouble with driving (or other transportation)	A great deal	**1**	**TROUBLE**
	A lot	**2**	
	Somewhat	**3**	
	Only a little	**4**	
	Not at all	**5**	

During the past 4 weeks…			
4. How much do your **work limitations** bother you?	Not at all bother some	**1**	**WORKLIM**
		2	
		3	
		4	
	Extremely bother some	**5**	
5. How much do your **social limitation** bother you?	Not at all bother some	**1**	**SILIMT**
		2	
		3	
		4	
	Extremely bother some	**5**	
6. How much do your **memory difficulties** bother you?	Not at all bother some	**1**	**MEMDIF**
		2	
		3	
		4	
	Extremely bother some	**5**	
7. How much do **physical effects** of antiepileptic drugs bother you?	Not at all bother some	**1**	**PHYEFF**
		2	
		3	
		4	
	Extremely bother some	**5**	
8. How much do **psychological effects** of antiepileptic drugs bother you?	Not at all bother some	**1**	**PSYCHOL**
		2	
		3	
		4	
	Extremely bother some	**5**	
9. How **afraid** are you of having a seizure during the next 4 weeks?	Very afraid	**1**	**AFRAID**
	Somewhat afraid	**2**	
	Not very afraid	**3**	
	Not afraid at all	**4**	

10. How has your QUALITY OF LIFE been during the past 4 weeks (that is, how have things been going for you)?

Very good: **Could hardly have been better**	**1**
Pretty good	**2**
Good & bad about equal	**3**
Pretty bad	**4**
Very bad: **could hardly have been worse**	**5**

11. How much does the state of your epilepsy-related quality of life **distress** you overall?	Not at all	**1**	**DISTRESS**
	Somewhat	**2**	
	Moderately	**3**	
	A lot	**4**	
	Very much	**5**	

Considering **ALL** the questions you have answered, please indicate the areas related to your epilepsy that are most **IMPORTANT** to you **NOW.**

12. Number the following topics from '1' to '7' with '1' corresponding to the most important topic and '7' to the least important one. Please use each number only once.	Energy(tiredness)		**A**	**DISTRESS**
	Emotions (mood)		**B**	
	Daily activities(work, driving, social & other activity)		**C**	
	Mental function(thinking, concentrating, memory)		**D**	
	Medication effects (physical, mental)		**E**	
	Worry about seizures(impact of seizures)		**F**	
	Overall quality of life		**G**	

4- World Health Organization Disability Assessment Schedule version 2.0 (12 item WHODAS-2)

SECTION 3: *WHO Disability Assessment Schedule II – 12 item scale*

The next few questions are about difficulties people have because of health conditions.

[Hand flashcard to respondent]

By health condition I mean diseases or illnesses, other health problems that may be short or long lasting, injuries, mental or emotional problems and problems with alcohol or drugs.

I remind you to keep all of your health problems in mind as you answer the questions. When I ask you about difficulties in doing an activity think about [Point to flashcard #1].

- Increased effort
- Discomfort or pain
- Slowness
- Changes in the way you do the activity

[Point to flashcard #1]. When answering, I'd like you to think back over the last 30 days. I also would like you to answer these questions thinking about how much difficulty you have, on average over the past 30 days, while doing the activity as you usually do it.

[Hand flashcard #2 to interviewee] Use this scale when responding.

[Read scale aloud]: None, mild, moderate, severe, extreme or cannot do.

[Flashcards #1 and #2 should remain visible to the respondent throughout the interview]

401	How do you rate your overall health in the past 30 days?	Very good	1	OVERALL
		Good	2	
		Moderate	3	
		Bad	4	
		Very bad	5	

	[Show flashcard #2 to participant.] In the last 30 days how much difficulty did you have in:			
402	Standing for long periods such as 30 minutes?	None	1	
		Mild	2	
		Moderate	3	STAND
		Severe	4	
		Extreme/cannot do	5	
403	Taking care of your household responsibilities?	None	1	
		Mild	2	
		Moderate	3	HOUSE
		Severe	4	
		Extreme/cannot do	5	
404	Learning a new task, for example, learning how to get to a new place?	None	1	
		Mild	2	
		Moderate	3	LEARN
		Severe	4	
		Extreme/cannot do	5	
405	How much of a problem did you have in joining community activities (for example, festivities, religious or other activities) in the same way as anyone else can?	None	1	
		Mild	2	
		Moderate	3	JOIN
		Severe	4	
		Extreme/cannot do	5	
406	How much have you been emotionally affected by your health problems?	None	1	
		Mild	2	
		Moderate	3	EMOTE
		Severe	4	
		Extreme/cannot do	5	

	In the last 30 days, how much difficulty did you have in:			
407	Concentrating on doing something for 10 minutes?	None	1	
		Mild	2	
		Moderate	3	CONC
		Severe	4	
		Extreme/cannot do	5	
408	Walking a long distance such as a kilometer?	None	1	
		Mild	2	
		Moderate	3	WALK
		Severe	4	
		Extreme/cannot do	5	
409	Washing your whole body?	None	1	
		Mild	2	
		Moderate	3	WASH
		Severe	4	
		Extreme/cannot do	5	
410	Getting dressed?	None	1	
		Mild	2	
		Moderate	3	DRESS
		Severe	4	
		Extreme/cannot do	5	
411	Dealing with people you do not know?	None	1	
		Mild	2	
		Moderate	3	DEAL
		Severe	4	
		Extreme/cannot do	5	
412	Maintaining a friendship?	None	1	FRIEND

		Mild	2	
		Moderate	3	
		Severe	4	
		Extreme/cannot do	5	
413	Your day to day work/ school?	None	1	
		Mild	2	
		Moderate	3	DAY
		Severe	4	
		Extreme/cannot do	5	
414	Overall, how much did these difficulties interfere with your life?	None	1	
		Mild	2	
		Moderate	3	INTERF
		Severe	4	
		Extreme/cannot do	5	
415	Overall, in the past 30 days, how many days were these difficulties present?	_____ days		DIFFDAYS
416	In the past 30 days, for how many days were you totally unable to carry out your usual activities or work because of any health condition?	_____ days		UNABLE

5. Alcohol, Smoking and Substance Involvement Screening Test (ASSIST version 3.1)

Instruction (please read to the respondent)

The following questions ask about your experience of using alcohol, tobacco products and khat across your lifetime and in the past three months. If you have taken these substances, please let me know. Please be assured that your responses will be treated as strictly confidential.

Definitions of terms that show frequency for questions 2-5

- ***Never*** - means that the substance has not been used at all in the last 3 months (i.e. score = 0).
- ***Once or twice*** - means that the substance has been used a total of 1 to 2 times in the last 3 months (i.e. score = 2).
- ***Monthly*** - means the substance has been used an average of 1 to 3 times per month in the last 3 months – resulting in a total of 3 to 9 times over the last 3 months (i.e. score = 3).
- ***Weekly*** - means the substance has been used an average of 1 to 4 times per week in the last 3 months (i.e. score = 4).

Daily or almost daily-means the substance has been used an average of 5 to 7 days per week in the last three months (i.e. score= 6).

Question 501: In your life, which of the following substances have you *ever used?*		Yes **[1]**	No **[0]**	**Response**
ASSIST_1T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)			**[ ]**
ASSIST_1A	Alcoholic beverages ('tella', 'tej', 'areki', beer, wine, etc.)			**[ ]**
ASSIST_1K	Khat			**[ ]**
Note: *If "No" to all items, stop interview. If "Yes" to any of these items, ask Q2 for each substance ever used*.				

Question 502: In the *past three months*, how often have you used the substances you mentioned (tobacco, alcohol, khat)?		**Never [0]**	**Once or twice [2]**	**Monthly [3]**	**Weekly [4]**	**Daily or almost daily [6]**	**Response**
ASSIST_ 2T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)						**[ ]**
ASSIST_ 2A	Alcoholic beverages (tella, tej, arakie, beer, wine, etc.)						**[ ]**
ASSIST_ 2K	khat						**[ ]**
Note: *If "Never" to all items in Q2, skip to Q6. If any substances in Q2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.*							

Question 503: During the *past three months*, how often have you had a strong desire or urge to use (tobacco, alcohol, khat)?		**Never [0]**	**Once or Twice [3]**	**Monthly [4]**	**Weekly [5]**	**Daily or almost daily [6]**	**Response**
ASSIST_ 3T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)						**[ ]**
ASSIST_ 3A	Alcoholic beverages (tella, tej, areki, beer, wine, etc.)						**[ ]**

ASSIST_ 3K	Khat						**[ ]**
Question: 504 During the *past three months*, how often has your use of (tobacco, alcohol, khat) led to health, social, legal or financial problems?		**Never [0]**	**Once or Twice [4]**	**Monthly [5]**	**Weekly [6]**	**Daily or almost Daily [7]**	**Response**
ASSIST_ 4T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)						**[ ]**
ASSIST_ 4A	Alcoholic beverages (tella, tej, areki, beer, wine, etc.)						**[ ]**
ASSIST_ 4K	Khat						**[ ]**

Question: 505 During the *past three months*, how often have you failed to do what was normally expected of you because of your use of (alcohol, khat)?		**Never [0]**	**Once or twice [5]**	**Monthly [6]**	**Weekly [7]**	**Daily or almost daily [8]**	**Response**
ASSIST_5A	Alcoholic beverages (tella, tej, areki, beer, wine, etc.)						**[ ]**
ASSIST_5K	Khat						**[ ]**

Question: 506 Has a friend or relative or anyone else *ever* expressed concern about your use of (tobacco, alcohol, khat)?		**No, never [0]**	**Yes, in the past three months [6]**	**Yes, but not in the past three months [3]**	**Response**
ASSIST_6T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)				**[ ]**
ASSIST_6A	Alcoholic beverages (tella, tej, areki, beer, wine, etc.)				**[ ]**
ASSIST_6K	Khat				**[ ]**

Note: *Ask question 6 for all substances ever used (i.e. those endorsed in Q1).*					
Question: 507 Have you *ever* tried to cut down on using (tobacco, alcohol, or khat) but failed?		**No, never [0]**	**Yes, in the past three months [6]**	**Yes, but not in the past three months [3]**	**Response**
ASSIST_7T	Tobacco products (shisha, cigarettes, chewing tobacco, cigars, etc.)				**[ ]**
ASSIST_7A	Alcoholic beverages (tella, tej, areki, beer, wine, etc.)				**[ ]**
ASSIST_7K	Khat				**[ ]**
Note: *Ask question-7 for all substances ever used (i.e. those endorsed in Q1).*					

6- The Family burden Interview Schedule (FIS)

Can you please tell me whether any of the following things have happened- not at all, sometimes, often or a lot over the past 6 months?				
601	You worried that your neighbors would treat you differently	Not at all	**0**	**WSGNB**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
602	You spent time worrying whether people would find out abo	Not at all	**0**	**WPKNP**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
603	You sometimes felt the need to hide this fact	Not at all	**0**	**SHPBM**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
604	You have helped other people to understand what it is like to have a psychiatric problems	Not at all	**0**	**MIUOP**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
605	When you met people for the first time, you made a special effort to keep this fact a secret	Not at all	**0**	**FPMCL**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
606	You worried that friends and neighbors would avoid you after they found out about it	Not at all	**0**	**AKPWN**
		Sometimes	**1**	

		Often	**2**	
		A lot	**3**	
607	You have found yourself explaining to others that you are not like their picture of "crazy" people	Not at all	**0**	**GAPMN**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
608	You worried that people would blame you for your problems	Not at all	**0**	**MIPBW**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
609	You worried that a person looking to marry would be reluctant to marry to you	Not at all	**0**	**BPFMNC**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
610	You worried about getting out	Not at all	**0**	**WHPWOH**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
611	You felt ashamed or embarrassed about it	Not at all	**0**	**PBSFG**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
612	You sought out people who also have a psychiatric problems	Not at all	**0**	**OLMIFM**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
613	You felt grief or depression because of it	Not at all	**0**	**BPMFD**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	
614	You felt somehow it might be your fault	Not at all	**0**	**BUSFDM**
		Sometimes	**1**	
		Often	**2**	
		A lot	**3**	

7.The Oslo 3-items social support scale Circle or underline the correct answer that applies for you							
		1	2	3	4	5	
701	How easy can you get help from neighbours if you should need it?	Very easy	Easy	Possible	Difficult	Very difficult	OSAS
2	How many people are so close to you that you can count on them if you have	None	1-2	3-5	5+		OSCRS

	serious problems?						
3	How much concern do people show in what you are doing?	A lot	Some	Uncertain	Little	No	OSNPS

1. List of Threatening Events revised version (LTE)				
801	In the last 6 months, have you yourself suffered a serious illness, injury or an assault?	Yes	1	LEILL
		No	2	
802	In the last 6 months has a serious illness, injury or assault happened to a close relative?	Yes	1	LEILR
		No	2	
		Don't Know	8	
		Refused	9	
803	In the last 6 months has your spouse, parent or child died?	Yes	1	LEBE
		No	2	
804	In the last 6 months has a close family friend or another relative died?	Yes	1	LEBEF
		No	2	
805	In the last 6 months have you had a separation due to marital difficulties?	Yes	1	LEMAR
		No	2	
806	In the last 6 months have you broken off a steady friendship or relationship?	Yes	1	LEREL
		No	2	
807	In the last 6 months have you had a serious problem with a close friend, neighbour or relative?	Yes	1	LEFR
		No	2	
808	In the last 6 months has your husband been unemployed? **not been able to work**	Yes	1	LEFIN
		No	2	
809	In the last 6 months have you had a major financial crisis (serious money worries)?	Yes	1	LETHF
		No	2	
810	**In the last 6 months have you lost or had anything stolen which mattered a lot to you?**	Yes	1	LEPOL
		No	2	
811	In the last 6 months have you had any problems with the police or courts?	Yes	1	LEUNH
		No	2	

Appendix D (2) Baseline lay interviewer administered questionnaire (Amharic version)

ቀን [ ] [ ] / [ ] [ ]/ [ ]
የጠያቂ ስም ----------
የጠያቂው ኮድ ቁጥር [ ] [ ] [ ] [ ]
የተሳታፊ ኮድ ቁጥር [ ] [ ] [ ] [ ]

1.	የግለሰቡ አጠቃላይ መረጃ			
101	ካርድ ቁ. [ከካርድ ማውጫው ላይ ተመልክተው ይሙሉ]			PCNO
102	ፆታ [የተጠያቂውን ፆታ አይተው ይመዝግቡ]	ወንድ	0	SEX
		ሴት	1	
103	እድሜ(ስንት አመትዎ ነው)	[ ] [ ]		AGE
104	መኖሪያ ስፍራ(የሚኖሩበት ቦታ የከተማ ወይስ የገጠርቀበሌ ነው?)	የከተማ	0	RES
		የገጠር	1	
105	የትኛው ቀበሌ ነው የሚኖሩት			KEBL
106	አሁን ባሉበት ቀበሌ ለምን ያህል ጊዜ ቆዩ	[ ][ ] ዓመት		RESDUR
107	የትምህርት ሁኔታ (የትምህርት ደረጃዎ ምንድን ነው?)	ምንም ያልተማሩ	1	EDU
		ማንበብና መፃፍ የሚችል ግን መደበኛ ትምህርት የሌለው (ለምሳሌ የቁስ ትምህርት፣ መሰረተትምህርት የተማረ)	2	
		መደበኛ ትምህርት ተከታትያለሁ	3	
108	መደበኛ ትምህርት ከተከታተሉ፡ እስከስንት ተምረዋል?	[ ][ ] ዓመት		EDUYR
109	ስራ (ገቢ የሚያገኙበት ወይም ቀንዎን የሚያሳልፉበት ስራዎ ምንድን‌ነው?)	ግብርና	1	EMP
		የግል ድርጅት ተቀጣሪ	2	
		የግል ድርጅት ስራ	3	
		በጎ ፈቃደኛ ስራ	4	
		የቤት እመቤት	5	
		ስራ አጥ	6	
		ተማሪ	7	
		ጡረተኛ	8	
		የመንግስት ሰራተኛ	9	
		የቀን/ የጉልበት ስራ	10	
		ሌላ [ይገለፅ]	77	
110	የገቢዎን(የኑሮዎን) ሁኔታ እንዴት ይገልፁታል?	በጣም ዝቅተኛ	1	REINC
		ዝቅተኛ	2	
		መካከለኛ	3	
		ከፍተኛ	4	
		በጣም ከፍተኛ	5	
111	የጋብቻ ሁኔታ (በአሁኑ ወቅት የትዳር ሁኔታ እንዴት ነው?)	ያላገባ	1	MARIT
		ያገባ	2	
		በፍቺ የተለያየ	3	
		በሞት የተለየ	4	

		ያገባ ግን በስራ ወይም በሌላ ምክንያት አብሮ የማይኖር	5	
		ያለ ህጋዊ ጋብቻ አብሮ የሚኖር	6	
112	ሀይማኖት(ሀይማኖትዎ ምንድን ነው?)	ኦርቶዶክስ ክርስቲያን	1	RELIG
		ሙስሊም	2	
		ፕሮቴስታንት	3	
		ሌላ [ይገለፅ]_____	4	
113	ብሔር (ብሔርዎ ምንድን ነው?)	ጉራጌ	1	ETHNIC
		ኦሮሞ	2	
		አማራ	3	
		ሌላ [ይገለፅ]_____	4	
114	የቤተሰብ መጠን (እርሶን ጨምሮ በቤትዎ ስንት ሰው ይኖራል?)	[_____] [_____]		FAMZ
115	በቅርብዎ ላለ ጤና ጣቢያ ለመድረስ ምን ያህል ይፈጅበታል ?			DFHS

የሚጥል ህመም ጋር የተያያዙ ዘርፎች

ተራ. ቁ	ጥያቄ	ምላሽ	ኮድ		Variable name
[	I. የህክምና አገልግሎት ስለማግኘት				
116	እስከ ዛሬ ድረስ ለሚጥል ህመም ከጤና ተቋም ህክምና አግኝተው ያውቃሉ? ምላሹ 0 ከሆነ ወደ 119 ይለፉ		የለም	0	TXLTB
			አዎን	1	
117	ህመሙ ከያዞት ከምን ያህል ጊዜ በኋላ ነበር ለመጀመሪያ ጊዜ ወደ ህክምና ተቋም የሄዱት?		[ ][ ]ቀናት [ ][ ] ወራት [ ][ ] አመታት (መመሪያ:መላሹ እንደገለጹት ይጻፍ)		DUPB
118	ለመጀመሪያ ጊዜ ህክምና ሲያገኙ እድሜዎ ስንት ነበር?		[ ][ ] አመት		TXAGEFB
119	ህመሙ ሲጀምሮት እድሜዎ ስንት ነበር?		[ ][ ] አመት		TONSET

2. SRQ-20

ቃለ-መጠይቁን ከመመላትዎ በፊት እባክዎትን በጠቅላላ መግቢያውን ያንብቡ/ያድምጡ **ይህንን ቃለ-መጠይቅ የሚሞላ ሁሉም ሰዎች ተመሳሳይ መመሪያ መከተሉ በጣም አስፈላጊ ነው፡፡**
የሚከተሉት ጥያቄዎች ባለፉት 30 ቀናት ውስጥ ሲረብሽዎት ከነበረ ህመም እና ችግር ጋር የተያያዘ ነው ጥያቄዎቹ ስለርስዎ የሚመለከት ከሆነ አዎ ብለው ይመልሱ ነገር ግን የእርስዎን የማይመለከት ከሆነ የለም ብለው ይመልሱ፡፡ መልሱን እርግጠኛ ካልሆኑ የሚችሉትን ያህል ይመልሱ የሚሰጡት መልስ በሚስጥር እንደሚያዝ ልናረጋግጥልዎም እንፈልጋለን

201	ባለፉት 30 ቀናት ብዙ ጊዜ ራስ ምታት ያምዎታል?	አዎ	1	SRHA
		የለም	0	
202	ባለፉት 30 ቀናት የምግብ ፍላጎት ቀንሷል?	አዎ	1	SRAP
		የለም	0	
203	ባለፉት 30 ቀናት የእንቅልፍ ችግር አለብዎት?	አዎ	1	SRSLP
		የለም	0	

204	ባለፉት 30 ቀናት በቀላሉ ይደነግጣሉ (ይበረግጋሉ)?	አዎ	1	SRFR
		የለም	0	
205	ባለፉት 30 ቀናት እጅ ይንቀጠቀጣል?	አዎ	1	SRTR
		የለም	0	
206	ባለፉት 30 ቀናት መረበሽ መጠበብ ወይም በሚረባውም በማረባውም ሐሳብ ይበዛብዎታል?	አዎ	1	SRWO
		የለም	0	
207	ባለፉት 30 ቀናት ምግብ ከበሉ በኋላ ሆድን ይከብድዎታል (ሆድን ይነፋዎታል)?	አዎ	1	SRID
		የለም	0	
208	ባለፉት 30 ቀናት በትክክል ማሰብ ይቸግርዎታል (ሀሳብ እየተዘበራረቀ ያስቸግርዎታል)?	አዎ	1	SRDT
		የለም	0	
209	ባለፉት 30 ቀናት ደስታ የማጣት ስሜት አለዎት?	አዎ	1	SRSA
		የለም	0	
210	ባለፉት 30 ቀናት ከወትሮው በላይ ያስለቅስዎታል?	አዎ	1	SRCR
		የለም	0	
211	ባለፉት 30 ቀናት በየቀኑ የሚሰሯቸው ስራዎች መደሰት ይቸግርዎታል?	አዎ	1	SRUHW
		የለም	0	
212	ባለፉት 30 ቀናት የእለት ተእለት ጉዳይ (ተግባር) ላይ ውሳኔ መወሰን ይቸግሮታል?	አዎ	1	SRPDM
		የለም	0	
213	ባለፉት 30 ቀናት የየእለት ተእለት ስራዎች ተበድሏል (ተድተንጉሏል)?	አዎ	1	SRWSF
		የለም	0	
214	ባለፉት 30 ቀናት በእለት ተእለት ኑሮ ላይ ጠቃሚ አስተዋፅየ (ተሳትፎ) ማበርከት አልቻልኩም ይላሉ?	አዎ	1	SRIRL
		የለም	0	
215	ባለፉት 30 ቀናት ለተለያዩ ነገሮች የነበርዎት ፍላጎት (ስሜት) ጠፍቷል?	አዎ	1	SRWS
		የለም	0	
216	ባለፉት 30 ቀናት የማልጠቅም ወይም ዋጋ ቢስ ነኝ ብለው ያስባሉ?	አዎ	1	SRFWL
		የለም	0	
217	ባለፉት 30 ቀናት ራስዎን የማጥፋት ሐሳብ መጥቶብዎት	አዎ	1	SRWTD

	ያውቃል?	የለም	0	
218	ባለፉት 30 ቀናት ሁልጊዜ ድካም ይሰማዎታል?	አዎ	1	SRFTIR
		የለም	0	
219	ባለፉት 30 ቀናት ሆድ ይረበሻል (ሆድ ውስጥ ያለመመቸት) ስሜት ይሰማዎታል?	አዎ	1	SRFDIS
		የለም	0	
220	ባለፉት 30 ቀናት በቀላሉ ይደክማሉ?	አዎ	1	SREGR
		የለም	0	
	እባክዎን ለ ጥቂት ደቂቃዎች እስካሁን የሰጡኝን መልስ እስክደምር ይታገሱኝ **[ከ 301-320; ያሉት ምላሾችን ይደምሩ]**	✍_____		SRTOT

3. በሕይወት ያለን ደስታ/እርካታን የሚመለከቱ ጥያቄዎች (QOLIE-10-p)

መመሪያ - የሚከተሉት ጥያቄዎች **ባለፉት 30 ቀናት** ስለ ነበርዎት ስሜት እና ስለአጋጠምዎት ችግሮች የሚጠይቁ ናቸው፡፡ለእንዳንደዱ ጥያቄ ከሚሰማዎት ጋር የሚቀራረበውን አንድ መልስ እንዲሰጡ እንጠይቆታለን፡፡

301. ባለፉት 30 ቀናት በጣም ጥሩ ጉልበት ወይም ብርታት ነበርዎት?	ሁልጊዜ	1	QOLEN
	አብዛኛውን ጊዜ	2	
	ግማሽ ጊዜ	3	
	አንዳንድ ጊዜ	4	
	አልፎ አልፎ	5	
	በጭራሽ ኖሮኝ አያውቅም	6	
302. ባለፉት 30 ቀናት የሀዘን ወይም የመደበት ስሜቶች ነበርዎት ወይ?	ሁልጊዜ	1	QOLSAD
	አብዛኛውን ጊዜ	2	
	ግማሽ ጊዜ	3	
	አንዳንድ ጊዜ	4	
	አልፎ አልፎ	5	
	በጭራሽ ኖሮኝ አያውቅም	6	
303. በባለፉት 30 ቀናት ውስጥ የሚጥል ሕመምዎ ወይም ለሚጥል ህመም የሚወስዱት መድሐኒት በሚጓዙበት ወይም በሚያሽከረክሩበት ወቅት ለምን ያህል ጊዜ ችግር ፈጠረብዎት?	በጣም ብዙ	1	QOLTRS
	ብዙ	2	
	በመጠኑ	3	
	በጥቂቱ	4	
	በጭራሽ	5	
ባለፉት 30 ቀናት			
304. እንደልብዎ መስራት አለመቻልዎ (በስራ መወሰንዎ) ምን ያህል ያሳስቦታል?	ምንም አያሳስበኝም	1	QOLWLM
		2	
		3	
		4	
	እጅግ በጣም ያሳስበኛል	5	
305. በማሕበራዊ ጉዳዮች ላይ እንደልብዎ አለመሳተፍዎ (መወሰንዎ) ምን ያህል ያሳስብዎታል?	ምንም አያሳስበኝም	1	QOLSLM
		2	
		3	
		4	

	እጅግ በጣም ያሳስበኛል	5	
306. እየረሱ መቸገርዎ ምን ያህል ያሳስብዎታል?	ምንም አያሳስበኝም	1	QOLMDIF
		2	
		3	
		4	
	እጅግ በጣም ያሳስበኛል	5	
307. የሚጥል ሕመም መድሃኒትዎ የሚያስከትለው አካላዊ የሆኑ የጎንዮሽ ጉዳቶች (ተዕኖዎች) ምን ያህል ያሳስብዎታል??	ምንም አያሳስበኝም	1	QOLPHE
		2	
		3	
		4	
	እጅግ በጣም ያሳስበኛል	5	
308. የሚጥል ሕመም መድሃኒትዎ የሚያስከትለው ስነልቦናዊ የጎንዮሽ ጉዳቶች (ተዕእኖዎች) ምን ያህል ያሳስብዎታል?	ምንም አያሳስበኝም	1	QOLPSE
		2	
		3	
		4	
	እጅግ በጣም ያሳስበኛል	5	
309. በሚቀጥሉት 30 ቀናት ውስጥ ሊጥልኝ ይችላል ብለው ምን ያህል ይፈራሉ?	በጣም ፈርቻለሁ	1	QOLAFR
	በመጠኑ ፈርቻለሁ	2	
	ብዙም አልፈራሁም	3	
	ምንም አልፈራሁም	4	
310. ላለፉት 30 ቀናት በሕይወት ያልዎት እርካታ ወይም ደስታ እንዴት ነው?	በጣም ጥሩ ነበረ (ከዚህ የተሻለ ለሆን አይችልም)	1	QOLOVR
	ቆንጆ ነበረ	2	
	ጥሩ እና መጥፎው ነበረ	3	
	መጥፎ ነበረ	4	
	በጣም መጥፎ ነበረ (ከዚህ የባሰ ሊሆን አይችልም)	5	
311. በአጠቃላይ በሚጥል ሕመም ዙርያ ያለው ሕይወት ምን ያህል ያስጨንቆታል (ይረብሽዎታል)?	በፍፁም	1	QOLDIS
	በመጠኑ	2	
	መሃከለኛ	3	
	በብዙ	4	
	በጣም ብዙ	5	

6. የአለም ጤና ድርጅት የእክል መገመቻ መጠይቅ (WHODAS 2.0)

የሚቀጥሉት ጥቂት ጥያቄዎች፡ ሰዎች በጤና መጓደል ምክንያት የሚገጥመዋቸው ችግሮችን ይመለከታሉ።።

<u>ለጠያቂ ማስታወሻ፡ ካርዶቹን ለተጠያቂ ስጥ እና የሚከተለውን ማብራሪያ ስጥ</u>:
ይህ ቃለመጠይቅ ሠዎች በጤና እክል ምክንያት ስለሚኖራቸዉ ችግር ይሆናል።። የጤና እክል ስል በሽታ ወይም ህመም ፣ ሌሎች ለአጭር ወይም ለረዥም ጊዜ የሚቆዩ የጤና ችግሮች፣ጉዳቶች፣ የአእምሮ ወይም የመንፈስ መታወክ እንዲሁም ከመጠጥ እና ከዕጽ ጋር የተገናኙ ችግሮችን ይሆናል።። ቃለመጠይቁን ሲመልሱ ሁሉንም የጤና ችግርዎን እንዲያስቡ እፈልጋለሁ።።

<u>ለጠያቂ ማስታወሻ፡ ካርዶቹን ለተጠያቂ ስጥ እና የሚከተለውን ማብራሪያ ስጥ</u>

“አንድን ተግባር ለማከናወን መቸገር“ ማለት፤

- ስራውን ለማከናወን ተጨማሪ ጥረት ሲያስፈልግ
- ስራውን ማከናወን አለመመቸት ወወይም የህመም ስሜት ሲፈጥር
- ስራውን ለማከናወን ብዙ ጊዜ ሲፈጅ
- ስራዉን ለማከናወን ቀድሞ ከሚሰሩበት ሌላ መንገድ ለመጠቀም ሲገደዱ ማለት ነው።። እንግዲህ አንድን ተግባር ለማከናወን ስለሚገጥምዎት ችግር ስጠይቆት እነዚህን እያሰቡ መልስ ይስጡ።።

□□ቁ□ቹን ሲመልሱ ያለፉትን 30 ቀናት እያስታወሱ ይሁን፡።እንዲሁም እነዚህ 4 ጥያቄዎች ሲመልሱ በአማካይ ባለፉት 30 ቅናት ብዙ ጊዜ የሚያከናዉኑት ስራ ለመፈጸመ ምን ያህል ችግር ይግጥምዎት እንድነበር እያስቡ

<u>ለጠያቂ ማስታወሻ፡ ካርድ ቁጥር 2ን ለተጠያቂ ስጥ እና የሚከተለውን ማብራሪያ ስጥ</u>፡፡
ጥያቄዎቹን ሲመልሱ እነዚህን 5 የችግር ወይም የእክል ደረጃዎች ይጠቀሙ።። ለተጠያቂው ይህንን ጮክ ብለው ያንብቡለት
<u>1. ምንም ችግር የለም</u> **<u>2. አነስተኛ ችግር</u>** **<u>3. መካከለኛ ችግር</u>** **<u>4. ከፍተኛ ችግር</u>** **<u>5. በጣም ከፍተኛ ችግር ወይም ፈጽሞ መስራት አለመቻል</u>**

<u>ለጠያቂ ማስታወሻ፤</u> መጠይቁ እስኪጠናቀቅ ድረስ ካርድ ቁጥር 1 እና ካርድ ቁጥር 2 ለመላሹ እንደሚታዩ መሆን አለባቸዉ፡፡				
401	**ላለፉት 30 ቀናት የነበሮትን አጠቃላይ የጤና ሁኔታ እንዴት ይገልፁታል?**	**በጣም ጥሩ**	1	OVERALL
		ጥሩ	2	
		ምንም አይል	3	
		መጥፎ ነበር/ ጥሩ አልነበረም	4	
		በጣም መጥፎ ነበር/ በጣም ጥሩ አልነበረም	5	
[ለጠያቂው ካርድ ቁጥር #2 ያሳዩ] **ላለፉት 30 ቀናት ውስጥ የሚከተሉትን ለመፈፀም ምን ያህል ተቸግረዋል**				
402	**ረዘም ላለ ጊዜ <u>መቆም</u> ምን ያህል ይቸግሮት ነበር? ለምሳሌ፣ ግማሽ ሰአት?**	**ምንም ችግር የለም**	1	STAND
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
403	**የቤት ውስጥ <u>ሃላፊነቶችን መወጣት</u> ምን ያህል ይቸግሮት ነበር?**	**ምንም ችግር የለም**	1	HOUSE
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
404	**<u>አዲስ ነገር ወይም ሥራ ለመማር ይቸገሩ ነበር</u>? (ለምሳሌ የእርሻ ስራ፣ ባልትና፣ የእጅ ስራ፣ የሞባይል አጠቃቀም ወዘተ...)**	**ምንም ችግር የለም**	1	LEARN
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
405	**በማህበራዊ እንቅስቃሴ ውስጥ (ለምሳሌ፡- ዓመት በዓል፣ ድግስ፣ ለቅሶ፣ እድር፣ ሊ.ቃ..ወዘተ) ልክ እንደሌላው ሰው መሳተፍ ምን ያህል ይቸግሮት ነበር?**	**ምንም ችግር የለም**	1	JOIN
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
406	**በጤናዎ ችግር ምክንያት መንፈስዎ ምን ያህል ተረብሿል?**	**ምንም ችግር የለም**	1	EMOTE
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
ላለፉት 30 ቀናት ውስጥ የሚከተሉትን ለመፈፀም ምን ያህል ተቸግረዋል፡				
407	**በሚሰሩት ሥራ ላይ ሀሳብዎን <u>ለጥቂት ጊዜ</u> (<u>ለ10 ደቂቃ</u>) <u>ያህል መሰብሰብ ይቸገሩ ነበር</u>?**	**ምንም ችግር የለም**	1	CONC
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
408	**<u>ረዘም ያለ ርቀት ለመጓዝ</u> ምን ያህል ይቸግሮት ነበር? ምሳሌ የሩብ ሰአት መንገድ (1ኪ.ሜትር)**	**ምንም ችግር የለም**	1	WALK
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	

409	ሠውነትዎን መታጠብ ምን ያህል ይቸግሮት ነበር?	ምንም ችግር የለም	1	WASH
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
410	ልብስዎትን ለመልበስ ምን ያህል ይቸግሮት ነበር?	ምንም ችግር የለም	1	DRESS
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
411	ከማያውቋቸው ሠዎች ጋር ተግባብቶ ጉዳይ መፈጸም ምን ያህል ይቸግሮት ነበር?	ምንም ችግር የለም	1	DEAL
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
412	በጓደኝነት መቆየት ምን ያህል ይቸግሮት ነበር?	ምንም ችግር የለም	1	FRIEND
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
413	የዕለት ተዕለት ሥራዎን ወይም ትምህርትዎን ለማከናወን ምን ያህል ይቸግሮት ነበር?	ምንም ችግር የለም	1	DAY
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
414	በጥቅሉ እነዚህ ችግሮች ኑሮዎ ላይ ምን ያህል ተፅእኖ አድርገዋል?	ምንም ችግር የለም	1	INTERF
		አነስተኛ ችግር	2	
		መካከለኛ ችግር	3	
		ከፍተኛ ችግር	4	
		በጣም ከፍተኛ ችግር ወይም ፈጽሞ ለመስራት አለመቻል	5	
415	በአጠቃላይ ባለፉት 30 ቀናት ዉስጥ እነዚህ ችግሮች ለምን ያህል ቀናት ነበሩ?	_____ ቀናት		DIFFDAYS
416	ባለፉት 30 ቀናት ዉስጥ፣ በማንኛዉም የጤና ችግር ምክንያት፣ የተለመደ ስራ ወይም እንቅስቃሴዎትን ሙሉ በሙሉ ማድረግ ያልቻሉት ለምን ያህል ቀናት ነበር?	_____ ቀናት		UNABLE

7. መጠጥ፤ ማጨስና ዕፅ ተጠቃሚነት መለኪያ (መማስተመ3.1)

መመሪያ፡ የሚከተለዉን ለተሳታፊዎች አንብብላቸዉ፡፡

የሚከተሉት ጥያቄዎች በህይወት ዘመንዎና ባለፉት ሦስት ወራት ውስጥ አልኮል፣ትንባሆ እና ሜት መጠቀምን በሚመለከለት የራስዎን ልምድ የሚጠይቁ ናቸው፡፡እነዚህን ነገሮች ተጠቅመው ከሆነ እባክዎ ይንገሩኝ፡፡

ከተራ ቁጥር 2-5 ላሉት ጥያቄዎች ድግግሞሽን የሚያመለክቱ ቃላት ትርጉም (ትርጉሙን ለተሳታፊ አታንብብ፡፡ አነተ ግን በቃልህ ያዝ፡፡)

<u>በጭራሽ</u>፣ ይህ ማለት ላለፉት ሦሥት ወራት በፍፁም አልተጠቀሙም ማላት ነው፡፡ (ከሆነ 0 ነጥብ ስጥ)

<u>አንድ ጊዜ ወይም ሁለት ጊዜ</u>፣ ይህ ማለት ባለፉት ሶስት ወራት ዉስጥ በአጠቃላይ ከ 1 እስከ 2 ጊዜ ዕፁን ተጠቅመዋል ማለት ነዉ፡፡ (ከሆን 2 ነጥብ ስጥ)::

<u>በየወሩ</u>: ይህ ማለት ላለፉት ሶስት ወራት ዉስጥ ዕጹን በየወሩ በአማካይ ከ1-3 ጊዜ ተጠቅመዋል፣ በድምሩም በሶስት ወራት ዉስጥ ከ3-9 ግዜ ተጠቅመዋል ማለት ነዉ፡፡ (ከሆነ 3 ነጥብ ስጥ) ::

<u>በየሳምንቱ</u>፣ ይህ ማለት ላለፉት ሶስት ወራት ዉስጥ ዕጹን በሳምነት በአማከይ ከ1-4 ጊዜ ተጠቅመዋል ማለት ነዉ፡፡ (ከሆነ 4 ነጥብ ስጥ).

<u>በየቀኑ ወይም ከሞላጎደል በየቀኑ</u>፣ ይህ ማለት ባለፉት ሶስት ወራት ዉስጥ በሳምንት ዕጹን በአማከይ ከ5-7 ቀናት ተጠቅመዋል ማለት ነዉ፡፡ (ከሆነ 6 ነጥብ ስጥ).

501. ከሚከተሉት ውስጥ በህይወት ዘመንዎ የትኛውን ንጥረ ነገር ተጠቅመዋል?			**አልተጠቀምኩም** [0]		**ተጠቅሜያለሁ** [1]	**ኮድ**
- የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣የሚታኘክ ትመባሆ፣ኮሸ			0		1	ASS-1T
- **የአልኮል መጠጦች**/ጠላ፣ጠጅ፣አረቂ፣ቢራ፣ወይን፣ወዘተ			0		1	ASS-1A
- ጫት			0		1	ASS-1K
ማሳሰቢያ፣ የሁሉም ጥያቄዎች መልስ <u>"አልተጠቀምኩም"</u> ከሆን ቃለመጠይቁን እዚሁ አቁም፡፡ ለአንድ ወይም ከዚያ በላይ ጥያቄ <u>" ተጠቅሜያለሁ"</u> የሚል መልስ ከተሰጠ ተጠያቂው ለተጠቀማቸው ነገሮች ሁሉ ጥያቄ ሁለትን ጠይቅ፡፡						
502. ባለፉት 3 ወራት ዉስጥ ከላይ ተጠቅሜ አውቃለሁ ያሉዋቸውን ነገሮች (አልኮል፣ ሲጋራ፣ ጫት) በየስንት ጊዜው ተጠቅመዋል?	**በጭራሽ** [0]	**አንድ ወይም ሁለት ጊዜ** [2]	**በየወሩ** [3]	**በየሳምንቱ** [4]	**በየቀኑ (ከሞላጎደል በየቀኑ)** [6]	**ኮድ**
የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣ የሚታኘክ ትመባሆ፣ኮሸ	0	2	3	4	6	ASS-2T
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0	2	3	4	6	ASS-2A
ጫት	0	2	3	4	6	ASS-2K
ማሳሰቢያ፣ በጥያቄ ቁጥር ሁለት ስር ለተዘረዘሩት ነገሮች ለሁሉም የተሰጠው መልስ "በጭራሽ አልጠቀምም" ከሆነ ወደ ጥያቄ ቁጥር 706 እለፍ፡፡ በጥያቄ ቁጥር ሁለት ስር ከተዘረዘሩት ነገሮች ተጠያቂው ባለፉት ሶስት ወራት አንዱን ተጠቅሞ ከነበር ለእያንዳንዱ ለተጠቀመው ነገር ጥያቄ ቁጥር 703 ፤ 704 ና 705ን ጠይቅ፡፡						
503. ባለፉት 3 ወራት ዉስጥ አነዚህን ነገሮች (አልኮል፣ሲጋራ፣ ጫት) ለመጠቀም በየስንት ጊዜው ያስኘዎት እና ስሜትዎ ያስገድደዎት ነበር?	**በጭራሽ** [0]	**አንድ ወይም ሁለት ጊዜ** [2]	**በየወሩ** [3]	**በየሳምንቱ** [4]	**በየቀኑ (ከሞላጎደል በየቀኑ)** [6]	**ኮድ**
የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣ የሚታኘክ ትመባሆ፣ኮሸ	0	2	3	4	6	ASS-3T
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0	2	3	4	6	ASS-3A
ጫት	0	2	3	4	6	ASS-3K
504.ባለፉት 3 ወራት ዉስጥ አነዚህን ነገሮች (አልኮል፣ሲጋራ፣ ጫት) በመጠቀመዎ በየስንት ጊዜው የጤና ፣የማሕበራዊ፣የሕግ	**በጭራሽ** [0]	**አንድ ወይም**	**በየወሩ** [3]	**በየሳምንቱ** [4]	**በየቀኑ (ከሞላጎደል**	**ኮድ**

መተላለፍ ወይም የግንዘብ ችግር አጋጠመዎት?		ሁለት ጊዜ [2]			በየቀኑ) [6]	
የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣ የሚታኘክ ትመባሆ፣ኮሸ	0	2	3	4	6	ASS-4T
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0	2	3	4	6	ASS-4A
ጫት	0	2	3	4	6	ASS-4K
505. ባለፉት 3 ወራት ዉስጥ አነዚህን ነገሮች (አልኮል፣ ጫት) በመጠቀመዎ ምክንያት በየስንት ጊዜው የሚጠበቅበዎትን ተግባራት ማከናዎን ሳይችሉ ቀሩ	በጭራሽ [0]	አንድ ወይም ሁለት ጊዜ [2]	በየወሩ [3]	በየሳምንቱ [4]	በየቀኑ (ከሞላጎደል በየቀኑ) [6]	ኮድ
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0	2	3	4	6	ASS-5A
ጫት	0	2	3	4	6	ASS-5K
ማሳሰቢያ፡ ጥያቄ ቁጥር 606ን ተጠያቂው ለተጠቀማቸው ነገሮች ሁሉ ጠይቅ።።						
506. ጓደኛ ፣ዘመድ ወይም ሌላ ሰዉ የእርስዎ አነዚህን ነገሮች (ትመባሆ፣አልኮል፣ጫት) መጠቀም እነዳአሰጨነቀዉ /እንዳሳሰበዉ / ገልጦልዎት ያዉቃል?	በፍፁም የለም [0]		አዎ ባለፉት ሶስት ወራት [6]		አዎ ባለፉት ሶስት ወራት ግን አይደለም [3]	ኮድ
የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣ የሚታኘክ ትመባሆ፣ኮሸ	0		6		3	ASS-6T
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0		6		3	ASS-6A
ጫት	0		6		3	ASS-6K
ማሳሰቢያ፡ ጥያቄ ቁጥር 7ን ተጠያቂው ለተጠቀማቸው ነገሮች ሁሉ ጠይቅ።።						
507. አነዚህን ነገሮች (ትምባሆ፣ አልኮል፣ ጫት) መጠቀመዎን ለመቀነስ ሞክረዉ አቅቶዎት ያዉቃሉ?	በፍፁም የለም [0]		አዎ ባለፉት ሶስት ወራት [6]		አዎ ባለፉት ሶስት ወራት ግን አይደለም [3]	ኮድ
የትምባሆ ምርቶች /ሺሻ፣ሲጋራ፣ የሚታኘክ ትመባሆ፣ኮሸ	0		6		3	ASS-7T
የአልኮል መጠጦች/ጠላ፣ጠጅ፣ አረቂ፣ቢራ፣ወይን፣ወዘተ	0		6		3	ASS-7A
ጫት	0		6		3	ASS-7K

8. **The Family Interview Schedule (FIS)** ማድላት እና መድልዎ ቃለ መጠየቂያ ቅፅ

እባክዎ እርስዎ ቀጥሎ ከተዘረዘሩት ችግሮች መሃል የአእምሮ ህመም ችግር ከገጠመዉ በኋላ የደረሰብዎት ካለ ፊጽሞ፣ አልፎ አልፎ፣ ጥቂት ጊዜ፣ አብዛኛዉን ጊዜ በማለት ይመልሱልኝ።።				
601	ጎረቤቶችዎ በተለየ ሁኔታ ያዩኛል ብለዉ ይጨነቃሉ	ፊጽሞ አልጨነቅም	0	WSGNB
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
602	ሰዎች ስለችግሩ ሊያዉቁብኝ ይችላሉ ብለዉ በመጨነቅ ያሳልፋሉ	ፊጽሞ አልጨነቅም	0	WPKNP
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
603	አንዳንድ ጊዜ ችግሩን መደበቅ እንዳለብዎት ይሰማዎታል	ፊጽሞ	0	SHPBM
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	

		አብዛኛዉን ጊዜ	3	
604	የአእምሮ ህመምተኛ መሆን ማለት ምን ማለት እንደሆነ ሌሎች ሰዎች እንዲገነዘቡት ረድተዋቸዋል	ፈጽሞ	0	MIUOP
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
605	ሰዎችን ለመጀመርያ ጊዜ ሲያገኙ ስለችግሩ እንዳያዉቁብዎት /ሚስጥር ለማድረግ/ የተለየ ጥንቃቄ አድርገዋል	ፈጽሞ	0	FPMCL
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
606	ጓደኞችዎ እና ጎረቤቶችዎ ስለችግሩ ካወቁ በኋላ ያገልሉኛል ብለዉ ይጨነቃሉ	ፈጽሞ አልጨነቅም	0	AKPWN
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
607	አንዳንድ ጊዜ ለሰዎች የአእምሮ ህመም በአእምሯቸዉ እንደሚያስቡት “እብድ” ማለት እንዳልሆነ ያስረዳሉ	ፈጽሞ	0	GAPMN
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
608	ሰዎች ስለ እኒ አእምሮ ህመም ችግር ሊወቅሱኝ ይችላሉ ብለዉ ይጨነቃሉ	ፈጽሞ	0	MIPBW
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
609	ከችግሩ የተነሳ ለትዳር ተመራጭ ላልሆን እችላለሁ ብለዉ ይጨነቃሉ	ፈጽሞ	0	BPFMNC
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
610	ከቤት ዉጭ መዉጣት ሲያስቡ ይጨነቃሉ	ፈጽሞ	0	WHPWOH
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
611	ከችግሩ የተነሳ ሀፍረት እና መሸማቀቅ ይሰማዎታል	ፈጽሞ	0	PBSFG
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
612	ሌሎች እንደእርስዎ የአእምሮ ህመምተኛ የሆኑ ሰዎችን ለማግኘት ይፈልጋሉ	ፈጽሞ	0	OLMIFM
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
613	ከችግሩ የተነሳ ሀዘንና ድባቴ ይሰማዎታል	ፈጽሞ	0	BPMFD
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	
614	ራስዎን እንደ ጥፋተኛ በመቁጠር ይወቅሳሉ	ፈጽሞ	0	BUSFDM
		አልፎ አልፎ	1	
		ጥቂት ጊዜ	2	
		አብዛኛዉን ጊዜ	3	

9. የኦስሎ ማህበራዊ ድጋፍ መለኪያ መጠይቅ(OSLO 3(Social support))

ለእርሶ ሁኔታ ትክክለኛ የሆነውን መልስ ያክብቡ				
701	ከጎረቤትዎቾ እርዳታ/ድጋፍ ቢያስፈልግዎ ማግኘት ምን ያህል ቀላል ነው?	በጣም ቀላል	1	OSAS
		ቀላል	2	
		የሚቻል	3	
		አስቸጋሪ	4	
		በጣም አስቸጋሪ	5	
702	ከፍተኛ ችግር ቢያጋጥምዎ የቅርብ የሆኑ እና ይረዱኛል ብለው የሚተማመኑባቸው ምን ያህል ሰዎች ይኖራሉ?	ምንም	1	OSCRS
		1-2	2	
		3-5	3	
		5+	4	
703	ሌሎች ሰዎች ስለ እርሶ ጉዳይ ምን ያህል ግድ ይላቸዋል	በጣም	1	OSNPS
		የተወሰነ	2	
		አላውቅም	3	
		ትንሽ	4	
		ምንም	5	

8. Life event(LTE)

በሰው ላይ ሊደርሱ የሚችሉ መጥፎ የህይወት አጋጣሚዎች List of Threatening Events revised version (LTE)				
801	ባለፉት 6 ወራት እርሶ ላይ ከበድ ያለ ህመም ፣የአካል ጉዳት ወይም ድብደባ አጋጥሞት ነበር?	አዎ	1	LEILL
		የለም	2	
802	ባለፉት 6 ወራት ውስጥ በቅርብ ዘመድዎ ላይ ከበድ ያለ ህመም ፣የአካል ጉዳት ወይም ድብደባ አጋጥሞት ነበር?	አዎ	1	LEILR
		የለም	2	
		አላውቅም	8	
803	ባለፉት 6 ወራት ውስጥ በጣም የቅርብ ዘመድ ማለትም ባለቤትዎ፤ ከወላጆችዎ አንዱ ወይም ከልጆችዎ አንዱ(አንዷ) የሞተ ሰው ነበር?	አዎ	1	LEBE
		የለም	2	
804	ባለፉት 6 ወራት ውስጥ የሞተብዎት የቤተሰብ ቅርብ ወዳጅ የሆነ ሰው ወይም ሌላ የቅርብ ዘመድ(አክስት፣ አጎት፣ አያት፣ የወንድም/የእህት ልጅ) አለ?	አዎ	1	LEBEF
		የለም	2	
805	ባለፉት 6 ወራት ውስጥ በትዳር ውስጥ በተፈጠረ አለመስማማት ምክንያት ከባለቤትዎ ተለያይተው ያውቃሉ?	አዎ	1	LEMAR
		የለም	2	
806	ባለፉት 6 ወራት ውስጥ ጠንካራ የነበረ ግንኙነት ወይንም ጓደኝነት አፍርሰዋል?	አዎ	1	LEREL
		የለም	2	
807	ባለፉት 6 ወራት ውስጥ በእርስዎ እና በቅርብ ጓደኞችዎ፤ ጎረቤቶችዎ ወይንም ዘመዶችዎ መካከል ጠንከር ያለ ችግር(ወይም ጠብ) አጋጥሞ ያውቃል?	አዎ	1	LEFR
		የለም	2	
808	ባለፉት 6 ወራት ውስጥከአንድ ወር በላይ ለሆነ ጊዜ ስራ አጥ ሆነው/ ወይም ከወር በላይ ለሆነ ጊዜ ስራ እየፈለጉ ማግኘት አቅቶት ነበር?	አዎ	1	LEUNH
		የለም	2	
809	ባለፉት 6 ወራት ውስጥ ከአቅምዎ በላይ የሆነ ከባድ የገንዘብ ችግር አጋጥሞት ነበር? (ከበድ ያለ ገንዘብ የማጣት ሞጅንቅ)?	አዎ	1	LEFIN
		የለም	2	
810	ባለፉት 6 ወራት ውስጥ እርሶ ትልቅ ግምት የሚሰጡት እቃ ጠፍቶቦት ወይም ተሰርቆቦት ያውቃል?	አዎ	1	LETHF
		የለም	2	
811	ባለፉት 6 ወራት ውስጥ ከፖሊስ ጋር የሚያገናኝዎ ወይም ፍርድ ቤት የሚያስኬድ ችግር ነበረብዎ?	አዎ	1	LEPOL
		የለም	2	

Appendix E Baseline psychiatric nurse assessment questionnaire

Brief ID details

Date [ ] [ ] [ ]

Interview's ID [ ] [ ] [ ]

Interviewer's ID [ ] [ ] [ ]

Operational Criteria for research (OPCRIT)

HISTORY			
Demographics and Presenting Complaint			
Source of rating	1	1. Hospital case notes (charts) 2. Structured interview with subject 3. Prepared abstract 4. Interview with informant 5. Combined sources including structured interview 6. Combined sources not including structured interview -8. Not applicable -9. Unknown	
Current employment/education Status	103	1. Unemployed/Not in education 2.Employed/In education -8.Not applicable -9.Unknown	
Current accommodation status	107	1.No fixed abode 2.High support accommodation 3.Low support accommodation 4.Rented independent accommodation 5.Owner occupied accommodation -8.Not applicable	
Twin	104	1.No 2.Yes-non identical 3.Yes-identical 4.Yes-unknown -8.Not applicable -9.Unknown	
First presentation	109	1. No 2. Yes -8.Not applicable -9.Unknown	
Age	101	Numerical value (1-99) -8.Not applicable -9.Unknown	
Ethnicity	102	1.Amhara 4. Sidama 2. Gurage 5. Tigray 3. Oromo 6. Other _____ -8.Not applicable -9.Unknown	
Gender	3	1. Male 2. Female -8. Not applicable -9. unknown	

History of Presenting Complaint				
Age of onset		4	Numerical value (1-99) -8.Not applicable -9.Unknown	
Mode of onset		5	1.Abrupt onset definable to within hours or days 2.Acute onset definable to within 1 week 3.Moderately acute onset definable within 1 month 4.Gradual onset over period up to 6 months 5.More gradual onset over period greater than 6 months -8.Not applicable -9.Unknown	
Lifetime duration of illness in weeks (appx, max 999)		8	Numerical value (1-999) -8.Not applicable -9.Unknown	
Course of disorder		90	1.Single episode with good recovery 2.Multiple episodes with good recovery between 3.Multiple episodes with partial recovery between 3 .Continuous chronic illness 4.Continuous chronic illness with gradual deterioration 5 .Continuous chronic illness with stepwise deterioration 6.Continuous chronic illness with rapid deterioration -8.Not applicable -9.Unknown	
Disorder causes impairment		87	1. No impairment 2. Subjective impairment at work, school, or in social functioning 3. Impairment in major life role with definite reduction in productivity and/or criticism has been received 4. No function at all in major life role for >2 days or inpatient treatment needed -8.Not applicable -9.Unknown	
Organic brain disease prior to onset		15	1. No 2. Yes -8.Not applicable -9.Unknown	
Stressful life events prior to onset		16	1. No 2. Yes -8.Not applicable -9.Unknown	
Drug or alcohol use prior to onset		170	1. No 2. Yes -8.Not applicable -9.Unknown	
Duration of current episode in weeks (max 99)		150	Numerical value 1-99 -8.Not applicable -9.Unknown	
During this episode patient or collateral informant reports…		151	No input	
Always Open	Risk of harm to others	152	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Risk of harm to self	153	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Risk of vulnerability and/or exploitation by others	154	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
Subject or collateral informant complains of		161	No input	
Always Open	Cognitive disturbance	155	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Problems related to substance misuse	156	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Psychotic symptoms	157	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Mood symptoms	158	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable - 9.Unknown	
	Anxiety/ Trauma response symptoms	159	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	

	Problems attributable to personality	160	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	
	Problems with eating, weight and body image	162	1.No 2.Yes (subject) 3.Yes (collateral) -8.Not applicable -9.Unknown	

Family History				
Family History of Mental Disorder		**200**	1. No 2. Yes -8.Not applicable -9.Unknown	
200=2	Schizophrenia	13	1. No 2. Yes -8.Not applicable -9.Unknown	
	Schizoaffective disorder	202	1. No 2. Yes -8.Not applicable -9.Unknown	
	Bipolar affective disorder	203	1. No 2. Yes -8.Not applicable -9.Unknown	
	Major depressive disorder	204	1. No 2. Yes -8.Not applicable -9.Unknown	
	Anxiety disorders	205	1. No 2. Yes -8.Not applicable -9.Unknown	
	Drug or Alcohol Dependence	206	1. No 2. Yes -8.Not applicable -9.Unknown	
	Personality disorder	207	1. No 2. Yes -8.Not applicable -9.Unknown	
	Dementia	208	1. No 2. Yes -8.Not applicable -9.Unknown	
	ADHD	209	1. No 2. Yes -8.Not applicable -9.Unknown	
	Autistic spectrum disorder	210	1. No 2. Yes -8.Not applicable -9.Unknown	
Family History of Physical Illness		**220**	1. No 2. Yes -8.Not applicable -9.Unknown	
220=2	Diabetes	221	1. No 2. Yes -8.Not applicable -9.Unknown	
	Cardiovascular disease	222	1. No 2. Yes -8.Not applicable -9.Unknown	
	Cerebrovascular disease	223	1. No 2. Yes -8.Not applicable - 9.Unknown	
	Malignant cancer	New	1. No 2. Yes -8.Not applicable -9.Unknown	

Personal History					
Adverse events in adolescence, childhood or the neonatal period		**250**	**1. No** **-8.Not applicable**	**2. Yes** **-9.Unknown**	
	Prematurity or low birth weight	252	1. No -8.Not applicable	2. Yes -9.Unknown	
	Obstetric difficulties or birth injury	253	1. No -8.Not applicable	2. Yes -9.Unknown	
	Failure to develop speech by age 3	254	1. No -8.Not applicable	2. Yes -9.Unknown	
	Failure to develop appropriate play by age 3	255	1. No -8.Not applicable	2. Yes -9.Unknown	
	Failure to develop expected abilities in social interaction by age 3	256	1. No -8.Not applicable	2. Yes -9.Unknown	
	Exposed to bullying at school	257	1. No -8.Not applicable	2. Yes -9.Unknown	
	Exposed to sexual abuse	258	1. No -8.Not applicable	2. Yes -9.Unknown	
	Exposed to physical abuse	259	1. No -8.Not applicable	2. Yes -9.Unknown	
	Diagnosis of ADHD made in childhood	260	1. No -8.Not applicable	2. Yes -9.Unknown	
	Diagnosis of conduct disorder made in childhood	261	1. No -8.Not applicable	2. Yes -9.Unknown	
	Diagnosis of autistic spectrum disorder made in childhood	262	1. No -8.Not applicable	2. Yes -9.Unknown	
	Diagnosis of depression or anxiety made in childhood	263	1. No -8.Not applicable	2. Yes -9.Unknown	
Highest educational attainment		**271**	1. Illiterate 2.Literate 3.GCSE/Equiv 4.A-level/Equiv 5.Degree or higher -8.Not applicable -9.Unknown		
Stressful life events in the six months prior to this episode		**280**	**1. No** **-8.Not applicable**	**2. Yes** **-9. Unknown**	
280=2	Serious illness, injury or assault	281	1. No -8.Not applicable	2. Yes -9.Unknown	
	Serious illness, injury or assault to a close relative	282	1. No -8.Not applicable	2. Yes -9.Unknown	
	Death of a parent, partner, child or sibling	283	1. No -8.Not applicable	2. Yes -9.Unknown	
	Death of a close family friend or other relative	284	1. No -8.Not applicable	2. Yes -9.Unknown	
	Marital separation or break in a steady relationship	285	1. No -8.Not applicable	2. Yes -9.Unknown	
	Serious Problem with a close friend, neighbor or relative	286	1. No -8.Not applicable	2. Yes -9.Unknown	
	Made redundant or sacked	287	1. No -8.Not applicable	2. Yes -9.Unknown	
	Seeking work for more than a month without success	288	1. No -8.Not applicable	2. Yes -9.Unknown	
	Major financial crisis	289	1. No -8.Not applicable	2. Yes -9.Unknown	
	Problem with the police or court appearance	290	1. No -8.Not applicable	2. Yes -9.Unknown	
	Loss of something that was highly valued	291	1. No	2. Yes	

			-8.Not applicable -9.Unknown	
	The birth of a child	292	1. No 2. Yes -8.Not applicable -9.Unknown	

Past Psychiatric History				
Lifetime history of self harm or psychiatric admission		**300**	**1. No 2. Yes** **-8. Not applicable -9.Unknown**	
300=2	Self harm	320	1. None 2. Once 3. 2-4 times 4. 5-10 times 5. 10+ times -8.Not applicable -9.Unknown	
	Attempted suicide	325	1. None 2. Once 3. 2-4 times 4. 5-10 times 5. 10+ times -8.Not applicable -9.Unknown	
	Informal admissions	330	1. None 2. Once 3. 2-4 times 4. 5-10 times 5. 10+ times -8.Not applicable -9.Unknown	
	Formal admissions	335	1. None 2. Once 3. 2-4 times 4. 5-10 times 5. 10+ times -8.Not applicable -9.Unknown	

Past Medical/Surgical History				
Past history of medical treatment or diagnosis		350	**1. No 2. Yes** **-8.Not applicable -9.Unknown**	
350=2	Hypertension	352	1. No 2. Yes -8.Not applicable -9.Unknown	
	Diabetes	353	1. No 2. Yes -8.Not applicable -9.Unknown	
	Hyperlipidaemia	354	1. No 2. Yes -8.Not applicable -9.Unknown	
	Thyroid Disease	355	1. No 2. Yes -8.Not applicable -9.Unknown	
	Cardiovascular disease	356	1. No 2. Yes -8.Not applicable -9.Unknown	
	Cerebrovascular disease	357	1. No 2. Yes -8.Not applicable -9.Unknown	
	Epilepsy	358	1. No 2. Yes -8.Not applicable -9.Unknown	
NOTES				

Drug and alcohol History					
Tobacco smoker ever?			**445**	**1. No 2.Yes -8. Not applicable -9. Unknown**	
445=2	Current smoker		446	1. No 2.Yes -8. Not applicable -9. Unknown	
	Average number of cigarettes smoked per day over lifetime		447	Numerical value (1-99) -8. Not applicable -9. Unknown	
	Number of years spent smoking		448	Numerical value (1-99) -8. Not applicable -9. Unknown	
	Pack years		449	=(Item 447/20)X (Item 448) -8. Not applicable -9. Unknown	
Life time-ever harmful use of alcohol or recreational drugs			**400**	**1. No 2.Yes -8. Not applicable -9. Unknown**	
400=2	Lifetime-ever harmful use of alcohol (> 1 month)		403	1. No 2. Past misuse only 3. Current misuse only 4. Current and past -8. Not applicable -9. Unknown	
	403=2,3,4	Current average weekly consumption	452	1. 0U- 24U 2. 25U- 49U 3. 50U-99U 4. 100U-199U 5. 200U-299U 6. 300U- 399U 7. >= 400U -8. Not applicable -9. Unknown	
		Binge drinking behavior (>= 6 drinks at a time)	411	1. Never 2. < monthly 3.Monthly 4. Weekly 5. Daily or almost daily -8. Not applicable -9. Unknown	
		Age of onset of regular use	401	Numerical Value (1-99) -8. Not applicable -9. Unknown	
		Mental disorder was precipitated by alcohol use	459	1. No 2.Yes -8. Not applicable -9. Unknown	
		Mental disorder is worsened by alcohol abuse	81	1. No 2.Yes -8. Not applicable -9. Unknown	
		Dependence criteria	412	No input	
		A strong desire or compulsion to take the substance	413	1. No 2.Yes -8. Not applicable -9. Unknown	
		Impaired capacity to control substance taking	414	1. No 2.Yes -8. Not applicable -9. Unknown	

			Presence of a physiological withdrawal state	415	1. No 2.Yes -8. Not applicable -9. Unknown	
			Evidence of tolerance	416	1. No 2.Yes -8. Not applicable -9. Unknown	
			Preoccupation with substance use, leading to a reduction in the pursuit of alternative interests	417	1. No 2.Yes -8. Not applicable -9. Unknown	
			Persistent substance use despite clear evidence of harmful consequences	418	1. No 2.Yes -8. Not applicable -9. Unknown	
	Life time-ever harmful use of cannabis (>1 month)			404	1. No 2. Past misuse only 3. Current misuse only 4. Current and past -8. Not applicable -9. Unknown	
	404=2,3,4	Average weekly expenditure		453	1. 0-49Birr 2. 50- 99 Birr 3. 100- 149 Birr 4. 150- 199 Birr 5. 200- 249 Birr 6. 250- 299 Birr 7. >300 Birr -8. Not applicable -9. Unknown	
		Age of onset of regular use		402	Numerical Value (1-99) -8. Not applicable -9. Unknown	
		Mental disorder was precipitated by cannabis abuse		460	1. No 2.Yes -8. Not applicable -9. Unknown	
		Mental disorder is worsened by cannabis abuse		82	1. No 2.Yes -8. Not applicable -9. Unknown	
		Dependence criteria		420	No input	
			A strong desire or compulsion to take the substance	421	1. No 2.Yes -8. Not applicable -9. Unknown	
			Impaired capacity to control substance taking behavior	422	1. No 2.Yes -8. Not applicable -9. Unknown	
			Presence of a physiological withdrawal state	423	1. No 2.Yes -8. Not applicable -9. Unknown	
			Evidence of tolerance	424	1. No 2.Yes -8. Not applicable -9. Unknown	
			Preoccupation with substance use, leading to a reduction in the pursuit of alternative interests	425	1. No 2.Yes -8. Not applicable -9. Unknown	
			Persistent substance use despite clear evidence of harmful consequences	426	1. No 2.Yes -8. Not applicable -9. Unknown	
NOTES						

Drug and Alcohol History (cont)				
Lifetime ever harmful use of opiates (>1 month)?		405	1. No 2. Past misuse only 3. Current misuse only 4. Current and past -8. Not applicable -9. Unknown	
405=2,3,4	Average weekly expenditure	454	1. 0-49Birr 2. 50- 99 Birr 3. 100- 149 Birr 4. 150- 199 Birr 5. 200- 249 Birr 6. 250-299 Birr 7. >300 Birr -8. Not applicable -9. Unknown	
	Age of onset of regular use	403	Numerical value (1-99) -8.Not applicable -9. Unknown	
	Mental disorder was precipitated by opiate use	461	1. No 2.Yes -8. Not applicable -9. Unknown	
	Mental disorder worsened by opiate abuse	450	1. No 2.Yes -8. Not applicable -9. Unknown	
	Dependence criteria	428	No input	
	A strong desire or compulsion to take the substance	429	1. No 2.Yes -8. Not applicable -9. Unknown	
	Impaired capacity to control substance taking behaviour	430	1. No 2.Yes -8. Not applicable -9. Unknown	
	Presence of a physiological withdrawal state	431	1. No 2.Yes -8. Not applicable -9. Unknown	
	Evidence of tolerance	432	1. No 2.Yes -8. Not applicable -9. Unknown	
	Preoccupation with substance use, leading to a reduction in the pursuit of alternative interests	433	1. No 2.Yes -8. Not applicable -9. Unknown	
	Persistent substance use despite clear evidence of harmful consequences	434	1. No 2.Yes -8. Not applicable -9. Unknown	
Lifetime ever harmful use of stimulants (>1 month)?		406	1. No 2. Past misuse only 3. Current misuse only 4. Current & past -8.Not applicable -9.Unknown	
405=2,3,4	Average weekly expenditure	455	1. 0-49Birr 2. 50- 99 Birr 3. 100- 149 Birr 4. 150- 199 Birr 5. 200- 249 Birr 6. 250-299 Birr	

			7. >300 Birr -8. Not applicable -9. Unknown	
	Age of onset of regular use	404	1. No 2.Yes -8. Not applicable -9. Unknown	
	Mental disorder was precipitated by stimulant use	462	1. No 2.Yes -8. Not applicable -9. Unknown	
	Mental disorder worsened by stimulant abuse	451	1. No 2.Yes -8. Not applicable -9. Unknown	
	Dependence criteria	436	No input	
	A strong desire or compulsion to take the substance	437	1. No 2.Yes -8. Not applicable -9. Unknown	
	Impaired capacity to control substance taking behaviour	438	1. No 2.Yes -8. Not applicable -9. Unknown	
	Presence of a physiological withdrawal state	439	1. No 2.Yes -8. Not applicable -9. Unknown	
	Evidence of tolerance	440	1. No 2.Yes -8. Not applicable -9. Unknown	
	Preoccupation with substance use, leading to a reduction in the pursuit of alternative interests	441	1. No 2.Yes -8. Not applicable -9. Unknown	
	Persistent substance use despite clear evidence of harmful consequences	442	1. No 2.Yes -8. Not applicable -9. Unknown	
NOTES				

Medication History			
Current psychotropic medication compliance	**475**	**1 .No medication currently prescribed 2. Fully compliant with medication 3. Partially compliant with medication 4. Has defaulted on medication for <2 weeks 5. Has defaulted on medication for >=2 weeks -8.Not applicable -9.Unknown**	
Psychotic symptoms respond to antipsychotics	**89**	**1. No 2. Yes-partial 3. Yes-full -8.Not applicable -9.Unknown**	
Mood instability symptoms respond to mood stabilizers or anti-manic agents	**480**	**1. No 2. Yes-partial 3. Yes-full -8.Not applicable -9.Unknown**	
Depressive symptoms respond to antidepressants	**481**	**1. No 2. Yes-partial 3. Yes-full -8.Not applicable -9.Unknown**	

Forensic History (500-549)						
Victim of serious violence/rape			**530**	**1. No 2. Yes -8. Not applicable -9.Unknown**		
History of criminal and/or violent behavior			**501**	**1. No 2. Yes -8. Not applicable -9.Unknown**		
501=2	Convictions under the age of 18		502	1. No 2. Yes -8. Not applicable -9. Unknown		
	502=2	Assaults and/or sexual aggression against others	503	1. No 2. Yes -8. Not applicable -9.Unknown		
		Thieving	504	1. No 2. Yes -8. Not applicable -9.Unknown		
		Drug Selling	505	1. No 2. Yes -8. Not applicable -9.Unknown		
	Convictions over the age of 18		510	**1. No 2. Yes -8. Not applicable -9.Unknown**		
	510=2	Assaults and/or sexual aggression against others	511	1. No 2. Yes -8. Not applicable -9.Unknown		
		Thieving	512	1. No 2. Yes -8. Not applicable -9.Unknown		
		Drug Selling	513	1. No 2. Yes -8. Not applicable -9.Unknown		
	Lifetime history of weapon use		520	1. No 2. Yes -8. Not applicable - 9.Unknown		

Social History (549-599)				
Deterioration from premorbid level of functioning		**88**	**1. No 2. Yes -8.Not applicable -9.Unknown**	
Current difficulties in activities of daily living		**550**	**1. No 2. Yes -8.Not applicable -9.Unknown**	
550=2	Social/interpersonal function	**551**	1. Fully capable 2. Partially capable 3. Incapable -8.Not applicable - 9.Unknown	
	Managing finances	**552**	1. Fully capable 2. Partially capable 3. Incapable -8.Not applicable -9.Unknown	

	Shopping	**553**	1. Fully capable 2. Partially capable 3. Incapable -8.Not applicable -9.Unknown	
	Dressing	**554**	1. Fully capable 2. Partially capable 3. Incapable -8.Not applicable -9.Unknown	
	Basic self-care	**555**	1. Fully capable 2. Partially capable 3. Incapable -8.Not applicable -9.Unknown	
Premorbid social function		**10**	**1. Unimpaired** **2. Impaired** **-8.Not applicable -9.Unknown**	
Premorbid employment/education history		**9**	**1. Unimpaired** **2. Impaired** **-8.Not applicable -9.Unknown**	
Employment/education status at onset		**7**	**1. Unimpaired** **2. Impaired** **-8.Not applicable -9.Unknown**	
Capacity to form enduring relationships with others		**6**	**1. Unimpaired** **2. Impaired** **-8.Not applicable -9.Unknown**	
NOTES				

MENTAL STATE EXAMINATION				
Time Frame		**2**	**1. Present or most recent episode** **2. Worst ever episode** **3. Lifetime ever occurrence of symptoms and signs** **4. Other specified episode or time period** **-8. Not applicable -9. Unknown.**	
Appearance and Behavior (600-649)				
Appearance/body movements abnormal		**600**	**1. No 2. Yes** **-8.Not applicable -9.Unknown**	
600=2	Lack of self care	601	1. No 2. Yes-Mild 3.Yes-Severe -8.Not applicable -9.Unknown	
	Weight	602	1.Normal 2.Severely underweight 3.Mildly underweight 4.Mildly overweight 5.Severely overweight -8.Not applicable - 9.Unknown	
	Extra-pyramidal movement abnormalities evident	603	1. No 2. Yes-Mild 3.Yes-Severe -8.Not applicable -9.Unknown	
Behavior abnormal		**620**	**1. No 2. Yes** **-8.Not applicable -9.Unknown**	
620=2	Excessive activity	19	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8. Not applicable -9. Unknown	
	Reckless activity	20	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8. Not applicable -9. Unknown	
	Distractibility	21	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8. Not applicable -9. Unknown	
	Agitated activity	23	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8. Not applicable -9. Unknown	
	Slowed activity	24	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8. Not applicable -9. Unknown	
	Catatonia	18	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9. Unknown	
	Bizarre behavior	17	1. No 2. Yes -8. Not applicable -9. Unknown	
	Difficult rapport	86	1. No 2. Yes -8. Not applicable -9. Unknown	
	Information is not credible	84	1. No 2. Yes -8. Not applicable -9. Unknown	

Speech and Form of Thought (650-699)				
Speech and/or thought form abnormal		**650**	**1. No 2. Yes -8. Not applicable -9. Unknown**	
650=2	Speech difficult to understand	26	1. No 2. Yes -8.Not applicable -9.Unknown	
	Speech incoherent	27	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Positive formal thought disorder	28	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Negative formal thought disorder	29	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Pressured speech	30	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
	Thoughts racing	31	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
NOTES				

Mood, Affect and Associated Features (700-739)				
Affect and mood abnormal		**700**	**1. No 2. Yes -8. Not applicable -9. Unknown**	
700=2	Restricted affect	32	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Blunted affect	33	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Inappropriate affect	34	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Elevated mood	35	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9. Unknown	

	Irritable mood	36	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9. Unknown	
	Dysphoria	37	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9. Unknown	
	Increased self esteem	56	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9. Unknown	
	Increased sociability	53	1. No 2. Over familiarity (duration 4+ days) 3. Loss of social inhibition with inappropriate behavior (≥1 week) 4. Inappropriate behavior lasts at least 2 weeks -8.Not applicable -9.Unknown	
	Poor concentration	41	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9.Unknown	
	Altered libido	40	1. No 2. Loss of libido for at least 1 week 3. Increase in libido for at least 1 week -8.Not applicable -9.Unknown	
	Diurnal variation (mood worse mornings)	38	1. No 2. Yes -8.Not applicable -9. Unknown	
	Loss of pleasure	39	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Loss of energy/tiredness	25	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Excessive self reproach	42	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
Suicidal ideation		**43**	**1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown**	
Sleep abnormal		**720**	**1. No 2. Yes -8. Not applicable -9. Unknown**	
720=2	Initial insomnia	44	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Middle insomnia (broken sleep)	45	1. No 2. Yes -8.Not applicable -9. Unknown	
	Early morning waking	46	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Excessive sleep	47	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Reduced need for sleep	22	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	

Appetite, eating behavior or body image abnormal		**730**	**1. No 2. Yes -8.Not applicable -9.Unknown**	
730=2	Poor appetite	48	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Weight loss	49	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Increased appetite	50	1. No 2. At least 1 week 3. At least 2 weeks 4. At least 1 month -8.Not applicable -9. Unknown	
	Weight gain	51	1. No 2. Mild (<5%) 3. Moderate (5-15%) 4. Severe (>15%) -8. Not applicable -9.Unknown	
	Eating Behaviour	732	1. Normal 2. Binges/Purges 3. Avoids fattening foods -8.Not applicable -9.Unknown	
	Body image	734	1. Normal 2. Believes too fat 3. Believes too thin/skinny 4. Believes a specific body part is abnormal -8. Not applicable -9.Unknown	

Anxiety, Trauma and Associated Features (740-850)				
Anxiety levels abnormal.			**740**	**1. No 2. Yes –8. Not applicable -9. Unknown**
740=2	Autonomic arousal symptoms during times of anxiety		741	1. No 2. Yes<1month 3. Yes>1month -8.Not applicable -9.Unknown
	Recurrent, abrupt attacks of severe anxiety…		750	1. No 2. Yes<1month 3. Yes>1month -8.Not applicable -9.Unknown
	750=3	…not restricted to any one situation	751	1. No 2. Yes -8.Not applicable --.9 Unknown
		…some of which are unpredictable	752	1. No 2. Yes -8.Not applicable --.9 Unknown
		…that reach a maximum within a few minutes and last at least some minutes before subsiding	753	1. No 2. Yes -8.Not applicable --.9 Unknown
		…that are characterized by autonomic arousal symptoms or other anxiety symptoms	754	1. No 2. Yes -8.Not applicable --.9 Unknown

	Prominent, excessive, free-floating anxiety and suffers from…		760	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
	760=3	…restlessness, feeling keyed-up or on-edge	761	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
		…being easily fatigued	762	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
		…poor concentration or 'mind going blank'	763	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
		…irritability	764	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
		…muscle tension	765	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
		…sleep disturbance	766	1. No 2.Yes<6months 3. Yes>6months -8. Not applicable -9.Unknown	
	Marked, consistent fear or avoidance of specific or general situations…		780	1. No 2. Yes -8. Not applicable -9.Unknown	
	780=2	…Crowds	781	1. No 2. Yes -8. Not applicable 9.Unknown	
		…Public places	782	1. No 2. Yes -8. Not applicable 9.Unknown	
		…Travelling alone	783	1. No 2. Yes -8. Not applicable 9.Unknown	
		…Travelling away from home	784	1. No 2. Yes -8. Not applicable 9.Unknown	
		…Being the focus of attention or behaving in an embarrassing way in a social situation	785	1. No 2. Yes -8. Not applicable 9.Unknown	
		785=2 During this suffers blushing or shaking, feels sick or need to urgently urinate or defecate.	790	1. No 2. Yes -8. Not applicable 9.Unknown	
	Obsessions and/or compulsions complained of…		800	1. No 2.Yes<2weeks 3. Yes>2weeks	

				-8. Not applicable -9.Unknown	
	800=3	…that are repetitive and unpleasant	801	1. No 2.Yes<2weeks 3. Yes>2weeks -8. Not applicable -9.Unknown	
		…that are resisted unsuccessfully	802	1. No 2.Yes<2weeks 3. Yes>2weeks -8. Not applicable -9.Unknown	
		…that are acknowledged as originating in their own mind	803	1. No 2.Yes<2weeks 3. Yes>2weeks -8. Not applicable -9.Unknown	
		…that are recognized as excessive or unreasonable	804	1. No 2.Yes<2weeks 3. Yes>2weeks -8. Not applicable -9.Unknown	
16=2	There has been a catastrophic traumatic event within six months of the onset of symptoms…		770	1. No 2. Yes -8. Not applicable -9.Unknown	
	…there is persistent re-experiencing of the traumatic event		771	1. No 2. Yes -8. Not applicable -9.Unknown	
	…there is persistent avoidance of triggers for the stressor or its memories or numbing of/detachment from general experience		772	1. No 2. Yes -8. Not applicable -9.Unknown	
	…there are persistent symptoms of hyperarousal		773	1. No 2. Yes -8. Not applicable -9.Unknown	

NOTES

Thought Content (850-899)				
Relationship between psychotic and affective symptoms (critical item rate carefully and strictly according to underlined criteria)		**52**	**1. No co-occurrence.** **2. Psychotic symptoms *dominate* the clinical picture although *occasional* affective disturbance may also occur.** **3. Psychotic and affective symptoms are *balanced but delusions or hallucinations have occurred for at least 2 weeks without prominent mood symptoms*.** **4. Affective symptoms *dominate* although *occasional* psychotic symptoms may also occur.** **-8. Not applicable -9. Unknown**	
Delusions present.		**850**	**1. No 2. Yes** **-8. Not applicable -9. Unknown**	
850=2	Delusions & hallucinations co-exist	64	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Paranoid/persecutory delusions	54	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Jealous delusions	65	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Widespread delusions	60	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Well organized delusions	55	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Bizarre delusions	59	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Delusions of influence	58	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Delusions of passivity	61	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	

	Primary delusional perception	62	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Other primary delusions	63	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Grandiose delusions	57	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
	Delusions of guilt	69	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
	Delusions of poverty	70	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
	Nihilistic delusions	71	1. No 2. At least 4 days 3. At least 1 week 4. At least 2 weeks -8.Not applicable -9.Unknown	
Passivity phenomena present.		**870**	**1. No 2. Yes** **-8. Not applicable -9.Unknown**	
	Thought insertion	66	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Thought withdrawal	67	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Thought broadcast	68	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
NOTES				

Perceptions (900-949)				
Abnormal perceptions present.		**900**	**1. No 2. Yes** **-8. Not applicable -9. Unknown**	
900=2	Thought echo	72	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	

	Third person auditory hallucinations	73	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Running commentary voices	74	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Abusive/accusatory/persecutory voices	75	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Other (non affective) auditory hallucinations	76	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Visual hallucinations	901	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	
	Non-affective hallucination in any modality	77	1. No 2. Present for less than 1 month or unspecified 3. Present for significant %age of a 1 month period -8.Not applicable -9.Unknown	

Cognition (950-999)				
Cognition tested		**950**	**1. No 2. Yes -8. Not applicable -9.Unknown**	
950=5	Executive function	951	1. Intact 2.Borderline 3.Impaired -8.Not applicable - 9.Unknown	
	Attention & concentration	952	1. Intact 2.Borderline 3.Impaired -8.Not applicable - 9.Unknown	
	Verbal fluency and word finding	953	1. Intact 2.Borderline 3.Impaired -8.Not applicable - 9.Unknown	
	Orientation	954	1. Intact 2.Borderline 3.Impaired -8.Not applicable - 9.Unknown	
	MMSE Score	960	Numerical value (0-30) -8.Not applicable -9.Unknown	
	Cognitive impairment is due to delirium	970	1. No 2. Yes -8.Not applicable -9.Unknown	

Insight & Capacity (1000-1099)			
Insight	**85**	**1. Intact 2. Impaired 3. Absent -8. Not applicable - 9. Unknown**	
Capacity to consent to admission	**1050**	**1. Intact 2. Impaired 3. Absent -8. Not applicable - 9. Unknown**	
Capacity to consent to medical treatment	**1060**	**1. Intact 2. Impaired 3. Absent -8. Not applicable - 9. Unknown**	
NOTES			

Clinical diagnosis	
OPCRIT Computer Algorithm	

Appendix F(1) End point lay interviewer questionnaire – (English version)

Brief ID details

Date [ ] [ ] [ ]

Interview's ID [ ] [ ] [ ]

Interviewer's ID [ ] [ ] [ ]

1. Treatment engagement

1	In the last 6 months how many times did you have a follow up for your illness (Epilepsy)?	_____		TRTENG
2.	In the last one month did you come to the health center for follow up ?	Yes	1	TRTMO
		No	0	

2. <u>Seizure control:</u>

1	Number of seizures for the last 6 months (since recruitment)	[ ] [ ] per day if >1/day	**SIEZNO**
		[ ][ ] per week if < 1/ day	
		[ ] [ ]per month if < 1/ week	
		[ ] [ ] per 06 month if < 1 / month	

Section two - the baseline assessment questionnaire will be repeated

- SRQ-20
- QOLIE-10p
- WHODAS
- ASSIST
- FIS
- OSLO
- LTE

Appendix F (2) End point lay interviewer questionnaire – (Amaharic version)

Brief ID. Detail

የጠያቂ ስም _____

የተሳታፊ ሙሉ ስም _____

የተሳታፊ ኮድ _____

የካርድ ቁጥር (PCNo) _____

1. **Treatment engagement**

1	**ባለፉት ስድስት ወር ውስጥ ምን ያህል ጊዜ ለአዙሪት ህመምዎ ክትትል አድርገዋል**	_____		TRTENG
2	**ያለፈው ወር ጤና ጣቢያ መተው ወይም ክትትል አድርገው ነበር**	**አዎ**	1	TRTMO
		የለም	0	

2. <u>Seizure control (የሚጥል ህመምን መቆጣጠርን ይመለከታል)</u>

1	**ለባለፉት ስድስት ወር የሚጥል ህመም ምን ያህል ጊዜ አጋጥሞት ነበር**	[ ] [ ] /**በአንድ ቀን የሚጥልዎት በቀን ከአንድ የሚበልጥ ከሆነ**	SIEZNO
		[ ] [ ] / **በሳምንት የሚጥልዎት በቀን በቀን ካልሆነ (ከአንድ ያነሰ ከሆነ**)	
		[ ] [ ] / **በወር የሚጥልዎት በሳምንት ከአንድ ያነሰ ከሆነ ካልሆነ**	
		[ ] [ ]/ በ6 **ወር የሚጥልዎት በወር ውስጥ ከአንድ ያነሰ ከሆነ**	

የቀሩት መጠይቆች ከባለፈው ቃለ መጠይቅ ጋር ተመሳሳይ ነው::

Appendix G Supplementary files

Supplementary file 1 – Search terms and strategy

Supplementary file 2 –Data extraction tool

Supplementary file 3- Sub- group analysis

Supplemtary file 4- Quality assessment for the included studies

Supplementary file 5 – conceptual model for SEM

Supplemtary file 6- charachterstics of participants who are lost to follow-up and remained in the cohort

Supplemtary file 7 – results of the measurement model

Supplementary file 8- SEM after imputation of data

Supplementary file 10 - codebook