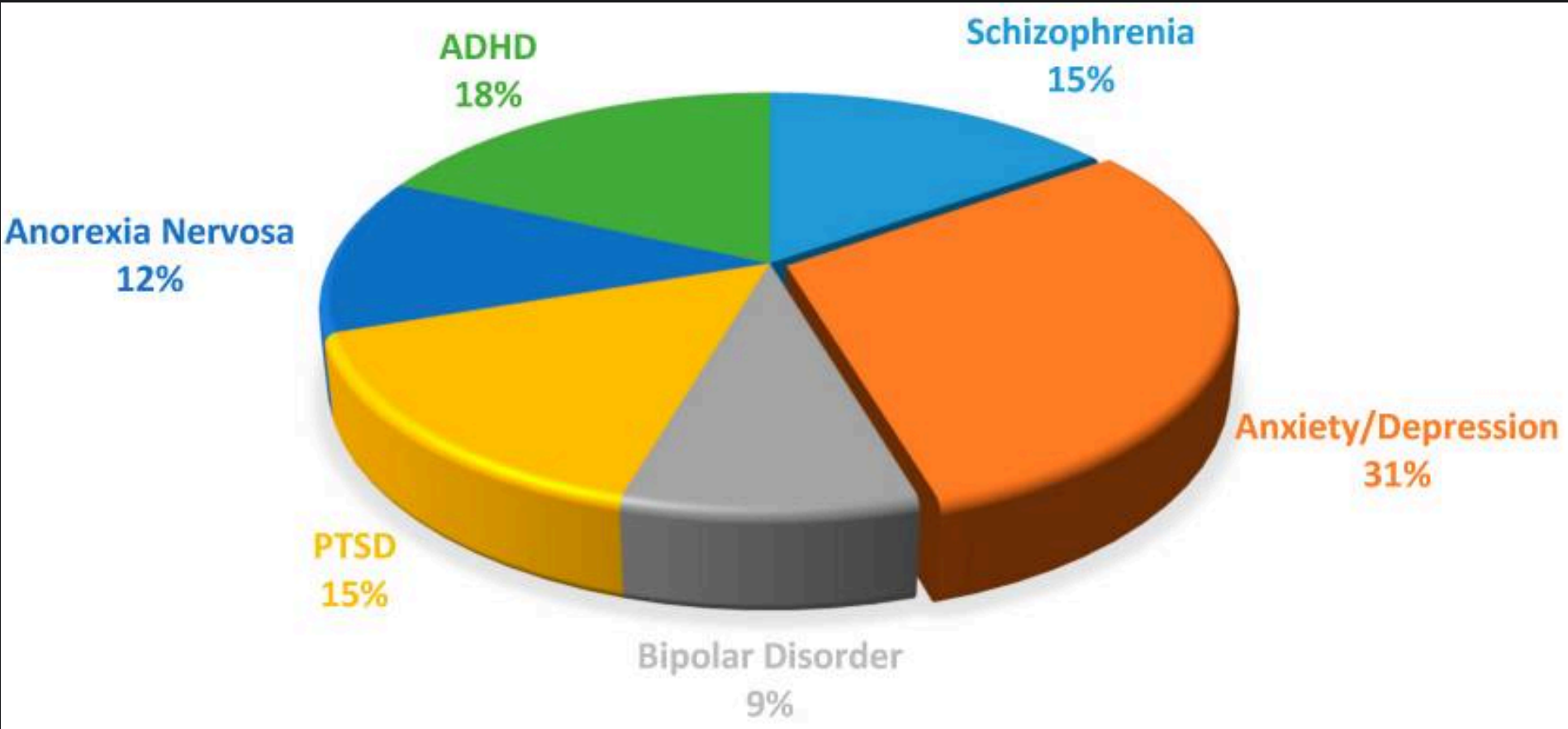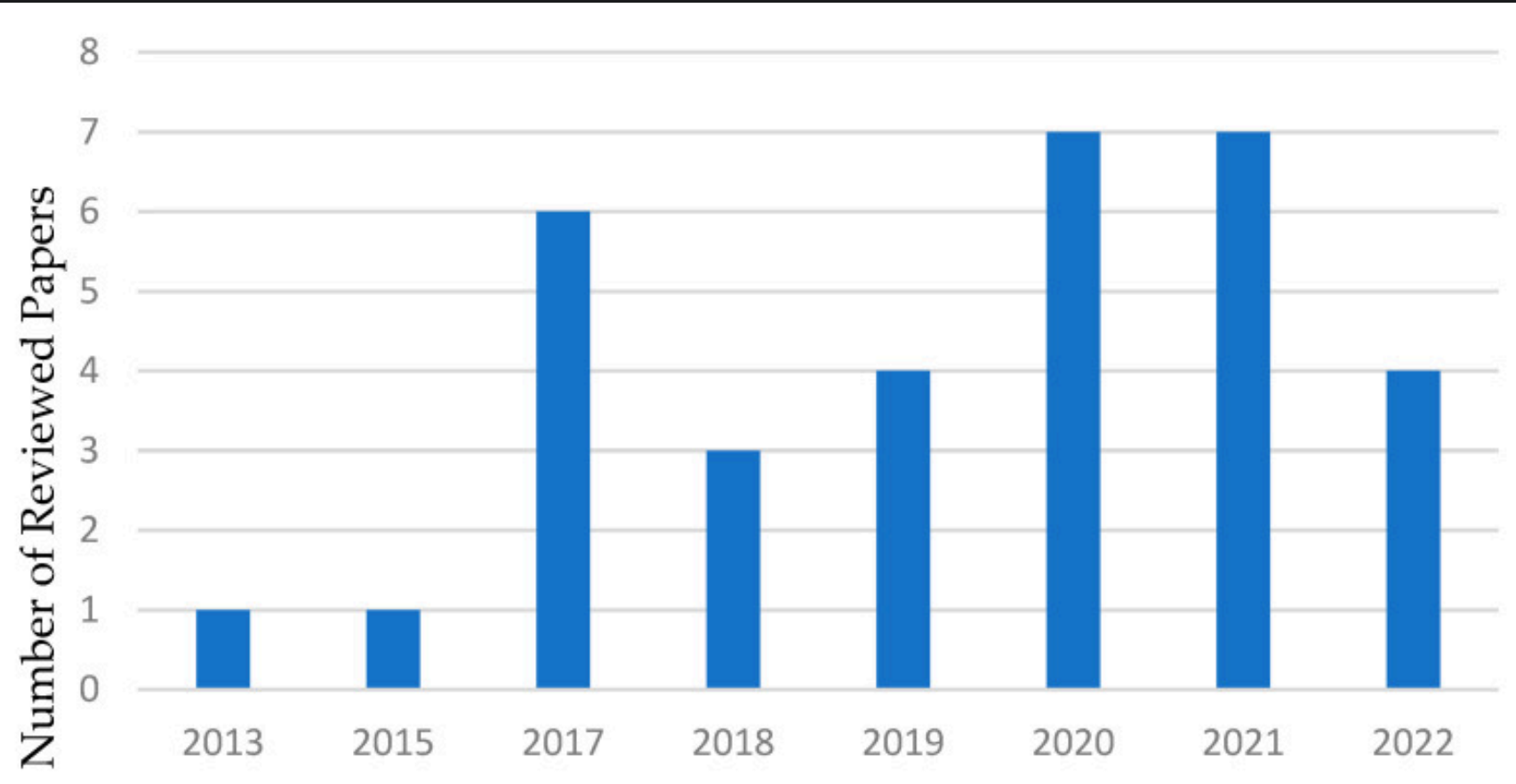# A REVIEW OF MACHINE LEARNING AND DEEP LEARNING APPROACHES ON MENTAL HEALTH DIAGNOSIS

NGUMIMI KAREN IYORTSUUN , SOO-HYUNG KIM , MIN JHON , HYUNG-JEONG YANG , SUDARSHAN PANT

# META ANALYSIS OF 33 STUDIES

ANALYSIS AND COMPARISON OF 33 ARTICLES THAT USES MACHINE LEARNING AND DEEP LEARNING TO DIAGNOSE MENTAL HEALTH CONDITIONS

OBJECTIVES OF THE STUDY

- Identify trends in ML/DL applications for diagnosing mental health disorders

  - What are the recent methods used by ML researchers for mental illness diagnosis over the years ?

- Compare methods and highlight their effectivness

- Establishing a list of accessible dataset for ML researchers

METHODOLOGY OF THE META ANALYSIS

- 33 Articles reviewed

- Disorders covered :

  - Schizophrenia
  - Depression
  - Anxiety
  - PTSD
  - ADHD
  - Bipolar disorder

- Framework : PRISMA

  (Preferred reporting Item for Systematic Reviews and Meta-Analysis)

- Articles selection criteria:

  - At least one menal health issue listed inclucled was examined
  - Full access to the article
  - Proposed approach used ML or DL approach
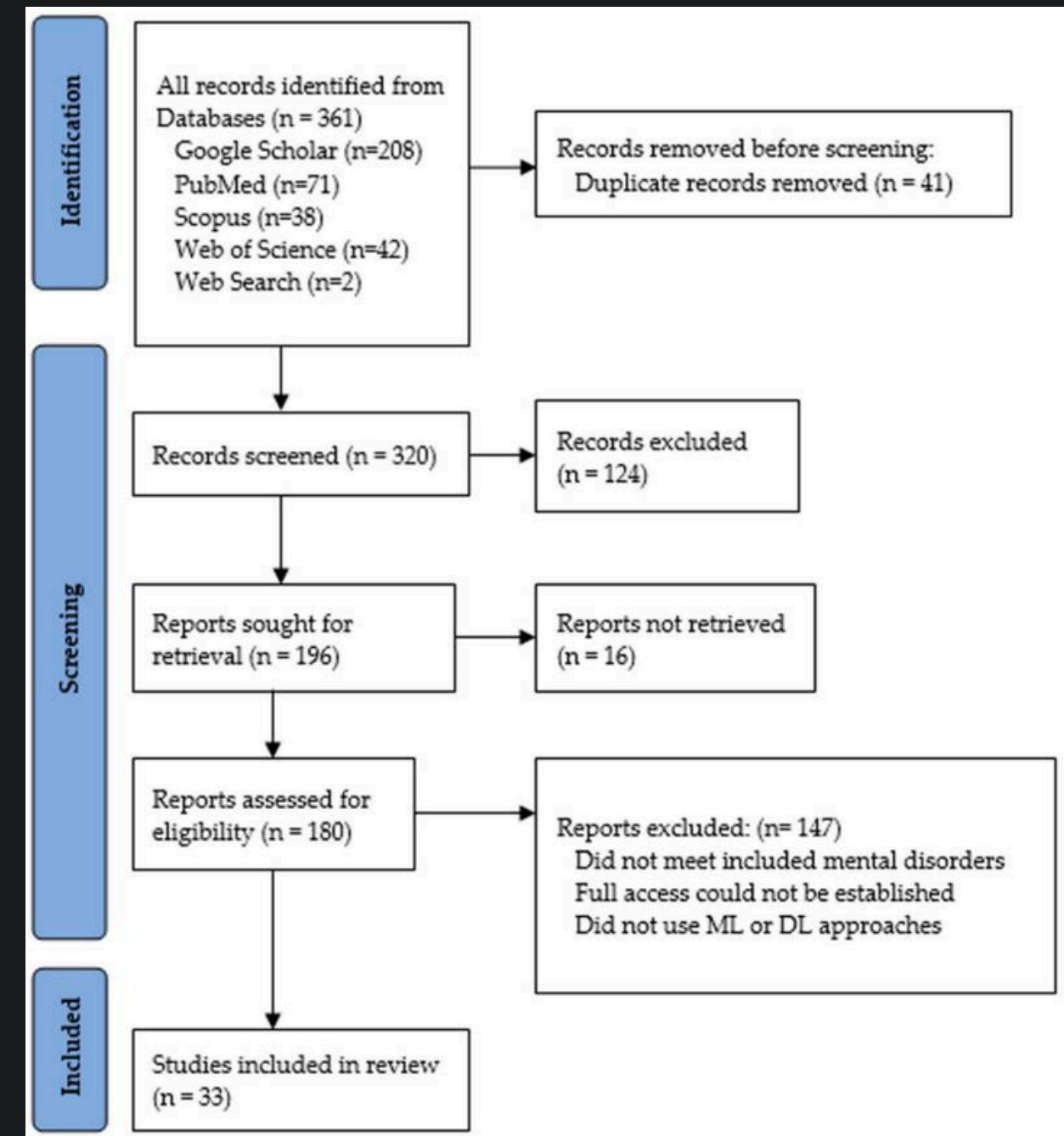
PRISMA FLOW DIAGRAM OF THE STUDY SELECTION PROCESS.

PROBLEMS IT TRIES TO ADRESS

- Lack of consolidated understanding in ML/DL applications in this field

    ○ Multiple studies spread all over the world

- Fragmentation in methodologies

    ○ Rapid growth of MD/DL application -> Multiple techniques being used

- Ethical and technical challenges in deploying AI in mental health

    ○ Dataset biases, ethical issues, real world scalability

TO WHAT EXTENT IT ADRESSES THESE PROBLEMS

- Comparative analysis:

  - Identifies trends, highlight effective methodologies

- Direction for future research

  - highlight the importance of building a cooperative dataset to fight against biases

  - Doesn't offer new solutions however

- Comprehensivness

  - Provides a valuable overview of the ML/DL approach in the mental health disorder diagnosis

WHETHER IT UNLOCKED OTHER USAGES/PROBLEMS

- Categorizing methodlogies

  - Inform future research direction

    - ex: Refining ML/DL models for specific conditions or dataset

- Foster interdisciplinary collaboration

  - Summarize accessible techniques to both AI and healthcare specialists

- Unresolved issues

  - Ethical and privacy concerns,

  - Generalizability: DL requires extensive training data compared to ML

  - Highlight the need for standardized evaluation metrics accross studies

ADEME SCENARIO

- ???

THANKS !