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ADMINISTRATIVE INFORMATION

Support - No Funding.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025100066

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 October 2025 and was last updated on 18 October 2025.

INTRODUCTION

Review question / Objective (1) What are the temporal trends in research on NLP-based approaches for mental health detection in clinical text analysis? (2) How is NLP applied across different types of mental health detection in clinical texts? (3) Which mental health detection domains most extensively utilize NLP? (4) What are the sources of clinical data used and the types of data languages involved? (5) What performance differences exist between DL and ML approaches? (6) What implementation barriers exist in clinical translation?

Background With the widespread use of clinical text data in forms such as Electronic Health Records (EHRs), a large volume of textual information containing patients' psychological states has been accumulated. Natural Language Processing (NLP) can efficiently extract key information to assist in identifying mental health issues such as depression and anxiety, thereby

improving the accuracy and efficiency of early screening and intervention, and advancing the development of precision mental healthcare. This study aims to systematically evaluate the current status of NLP-based clinical text analysis in the field of mental health detection, comprehensively analyzing the types of NLP, data sources, mental health conditions, performance, and limitations, to provide a scientific basis for future research and practical applications.

Rationale Despite NLP's tremendous potential in mental health detection, existing review studies exhibit several limitations. Data-wise, most research relies on single-institution datasets lacking multicenter validation, resulting in significant performance drops when applied elsewhere. Additionally, datasets often underrepresent vulnerable populations like ethnic minorities and low-income groups. Methodologically, excessive focus on technical performance metrics overshadows the more critical dimension of clinical applicability.

METHODS

Strategy of data synthesis Descriptive statistical analysis was used.

Eligibility criteria Database Search formula
 Web of Science ("natural language processing" OR "NLP" OR "large language model*" OR "LLM" OR "generative AI" OR "generative artificial intelligence" OR "GPT" OR "BERT" OR "RoBERTa" OR "transformer") AND ("mental health" OR "mental disorder*" OR "depression" OR "depressive disorder*" OR "anxiety" OR "anxiety disorder*" OR "suicidal ideation" OR "suicide" OR "self-harm" OR "PTSD" OR "ADHD" OR "attention deficit" OR "bipolar disorder" OR "schizophrenia") AND ("clinical note*" OR "case note*" OR "electronic health record*" OR "EHR" OR "electronic medical record*" OR "EMR" OR "clinical text" OR "clinical narrative*") AND (Document Types: Article or Proceeding Paper) AND (Languages: English)
 Scopus TITLE-ABS-KEY("natural" AND "language" AND "processing") OR TITLE-ABS-KEY("NLP") OR TITLE-ABS-KEY("large" AND "language" AND "model") OR TITLE-ABS-KEY("LLM") AND TITLE-ABS-KEY("mental" AND "health") OR TITLE-ABS-KEY("mental" AND "disorder*") OR TITLE-ABS-KEY("depression") OR TITLE-ABS-KEY("anxiety") OR TITLE-ABS-KEY("clinical" AND "text") OR TITLE-ABS-KEY("EHR") OR TITLE-ABS-KEY("electronic" AND "health" AND "record*") OR TITLE-ABS-KEY("clinical" AND "note") AND Article type: Articles AND Languages: English
 PubMed (((natural language processing[MeSH Terms]) OR (NLP[MeSH Terms])) AND (mental health[MeSH Terms])) AND (mental disorder*[MeSH Terms]) AND (clinical text[MeSH Terms]) AND (Full text)
 IEEE Xplore ("All Metadata": natural language processing) OR ("All Metadata": NLP) AND ("All Metadata": mental health) AND ("All Metadata": clinical text).

Source of evidence screening and selection

Inclusion Criteria Exclusion Criteria

Research on the use of NLP or LLM methods

Research without the use of NLP or LLM methods

Target mental health detection Non-target mental health detection

Use of clinical text (EHRs, case notes, interviews)

Non-clinical data (e.g., social media, forums)

Research-type articles Review articles, theses, non-academic publications, book chapters, etc.

Full text in English Full text in other languages.

Data management A standardized data extraction form will be created using Microsoft

Excel to capture all key information. All data will be securely stored on a password-protected institutional server/cloud drive. Analytical data will be archived and retained for at least five years after publication, in accordance with institutional policy.

Language restriction English.

Country(ies) involved China.

Keywords NLP, Mental health detection, Clinical text, Systematic review.

Contributions of each author

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