

**Paper Title:** *Application of Natural Language Processing (NLP) in Detecting and Preventing Suicide Ideation: A Systematic Review*

**Paper Link:** <https://www.mdpi.com/1660-4601/20/2/1514>

## 1 Summary

### **1.1 Motivation**

This study is centered on assessing the role of NLP in preventing suicide, examining its efficacy and constraints, aiming to provide suggestions for enhancement and pinpoint areas for future investigation. Machine learning, encompassing NLP and text analytics, exhibits potential in mental health applications, including the identification and treatment of conditions like depression, PTSD, and homelessness.

### **1.2 Contribution**

This study seeks to enhance the expanding research domain dedicated to developing suicide prevention tools. Its objective is to delve into and synthesize crucial research on the application of Natural Language Processing (NLP) for identifying suicidal thoughts. Through this investigation, the aim is to contribute valuable insights that can further advance the field of suicide prevention.

### **1.3 Methodology**

Conducted as a qualitative study, this research aimed to comprehensively review studies utilizing NLP and other text analytics methods to identify or detect suicidal ideation. Adhering to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) standards, the systematic review was undertaken to enhance transparency and ensure high-quality reporting in publications. The methodologies include

### **1.4 Conclusion**

In essence, the utilization of artificial intelligence and machine learning presents novel opportunities for substantial improvements in risk prediction and suicide prevention frameworks. As indicated by the studies considered, NLP can serve as a cost-effective and resource-efficient alternative to traditional suicide prevention methods. The substantial evidence suggests that NLP is advantageous in identifying individuals with suicidal thoughts, offering distinctive opportunities for effective suicide prevention.

## 2 Limitation

### **2.1 First limitation**

This study has certain limitations. Firstly, it did not consider preprints and unpublished papers, potentially leaving out grey literature and additional data. Nonetheless, systematic searches were performed in Ovid-based databases such as MEDLINE and Embase, and the retrieved studies underwent a manual reference search.

### **2.2 Second limitation**

Secondly, the methodologies employed in the incorporated research are highly diverse, and there are no metrics accessible to evaluate their effectiveness. Consequently, a meta-analysis could not be undertaken.

## 3 Synthesis

The synthesis, analysis, and reporting of findings from the included studies contribute to consolidating knowledge and identifying patterns or trends in the application of NLP for suicide prevention. This step serves as a bridge between existing research and potential applications or future scopes. The process also involves making future suggestions and pinpointing prospective research areas, indicating a forward-looking perspective that encourages the development of new ideas or approaches.