Identifying Level of Depression with the Help of Machine Learning

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2016-2-60-030 2016-1-60-010

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# Introduction

## Objectives

* Offers promising solutions to improve diagnosis and treatment
* Develop a model that can forecasting depression level.

## Motivation

Machine learning approaches for mental health problem are still new. But they offer a potential tool for mental health prevention. And our study also offers an important implication for future research.

## Existing works:

Over the years, machine learning methods have been used in many areas such as child welfare, education, physical health**,** criminal justice and domestic violence.

Researchers are using machine learning techniques to help Inform arraignment decisions (Berk, Sorenson & Barnes, 2016), forecasting dangerous inmate misconduct (Berk, Sherman, Barnes, Kurtz, and  Ahlman, 2009).

Machine learning techniques are attracting significant attentiveness from medical researchers. Nowadays predictive analytics can help in predicting mental health problems in adolescence. Psychopathological characteristics in early childhood also often allude a higher risk for mental health problems in adolescence and adulthood.

Machine learning techniques can forecast patient outcomes and inform prevention approaches. It could help our health care system (Amarasingham ,2014). This study is one of the first to use machine learning technique to inform the restraint of mental health problems, such as depression.

## Necessity:

The primary aim of our study is to develop a model that can predict mental health problems. It delivers support for the concept of using a machine learning predicting tool to identify individuals with mental health problems, such as depression. Our tool could be implemented in numerous practice settings including a primary care hospital, mental health organization. In the primary care setting, our tool may be specifically helpful in identifying people with underlying mental health problems.

**2. Methodology:**

**3. Implementation:**

**3.1 Data Collection:**

**3.2 Data Processing**

**3.3 Model Development**

**3.4 Results**

**4. Conclusions:** Depression is one of the most common mental health problems in our Bangladesh and worldwide. But machine learning implements have the potential to improve the diagnosis and treatment of mental health problems and consequently may help people’s healthier lives.

**4.1 Challenges:** The results from this machine learning procedure may be different by gender, region, caste, race, that’s why this is a challenging issue to collect proper data for balancing our research. For avoiding unambiguousness, we randomly partitioned our data set into two independent sets, those are training set and test set. We use training set to train the model and test set is used to validate the accuracy of the model.

**4.2 Limitations:** This study is our first study using machine learning techniques within the context of the prevention of depression, that’s why there are some limitations. First, this study relies on our data set. Our data set could be impacted by a respondent’s mood that day. And it could be impacted how the person perceives and remembers experiences or past events. Despite these limitations, this study has important implications for further research and practice.

**4.3 Future Directions:**  However, this study shows up how a machine learning predicting tool could be used to apprise prevention policy for depression diagnosis.

This dissertation shows that it is practicable to use a tool predicting to identify a depressive disorder patient. This study highlights many circumstances and helps for future research and practice to identify and prevent depression. As part of future work, we plan to extend our approach and improve the quality and effectiveness about our study.

# References

1. WHO, “Depression.” https://www.who.int/news-room/factsheets/detail/depression, Jan. 2020.
2. A. Z. M. S. A. R. . C. R. Victor, E., “Detecting depression using a framework combining deep multimodal neural networks with a purpose-built automated evaluation.,” *Psychological Assessment*, vol. 31, no. 8, p. 1019–1027, 2019.
3. Ashley E. Tate, Ryan C. McCabe, Henrik Larsson,

Sebastian Lundström, Paul Lichtenstein, Ralf Kuja-Halkola, Predicting mental health problems in adolescence using machine learning techniques, PLOS ONE, 10.1371/journal.pone.0230389, 15, 4, (e0230389), (2020).

1. Forecasting Domestic Violence: A Machine Learning Approach to Help Inform Arraignment Decisions .Richard A. Berk,Susan B. Sorenson ,Geoffrey Barnes

<https://doi.org/10.1111/jels.12098>

1. Forecasting murder within a population of probationers and parolees: A high stakes application of statistical learning .Berk, Sherman, Barnes, Kurtz, & Ahlman,January 2009 . Journal of the Royal Statistical Society Series A (Statistics in Society) 172(1):191-211

DOI: [10.1111/j.1467-985X.2008.00556.x](https://www.researchgate.net/deref/http%3A%2F%2Fdx.doi.org%2F10.1111%2Fj.1467-985X.2008.00556.x)

1. Predicting mental health problems in adolescence using machine learning techniques

Ashley E. TateID

Ryan C. McCabeID, Henrik Larsson, Sebastian Lundstro,

Paul Lichtenstein, Ralf Kuja-Halkola

<https://doi.org/10.1371/journal.pone.0230389>

1. Detecting Depression Using a Framework Combining Deep Multimodal Neural Networks with a Purpose-Built Automated Evaluation

Ezekiel Victor a,Zahra M. Aghajan, Ph.D.

Amy R. Sewart, M.A.,Phil

Ray Christian., B.B.A.

# [8] Implementing Electronic Health Care Predictive Analytics: Considerations And Challenges

# Ruben Amarasingham, Rachel E. Patzer, Marco Huesch, Nam Q. Nguyen and Bin Xie

https://doi/full/10.1377/hlthaff.2014.0352