Suicidal thoughts influenced by the COVID-19 pandemic: A comparative study using Twitter data

Dilanka R.D.S.[1] and Rupasingha R.A.H.M.[2*]

[1]*Department of Computing and Information Systems, Sabaragamuwa University of Sri Lanka, Sri Lanka.*
[2]*Department of Economics and Statistics, Sabaragamuwa University of Sri Lanka, Sri Lanka.*

The COVID-19 pandemic may have caused unanticipated behavioral changes that may have led to the upward trend in reported suicidal attempts. COVID-19 period was one reason to change pre-existing mental health, domestic violence, anxiety, and depression. And self-isolation and quarantine, may raise feelings of isolation, sadness, alcohol and drug use, and suicidal thoughts. When compared, people's mental health changed before, during and after the pandemic period. Therefore, gathering information on the prevalence of suicide and suicide attempts worldwide during the pandemic is essential and crucial. Twitter is one of the main places to share people's thoughts in different situations. Here we have focused on tweets of those who had suicidal thoughts and tweets of others who tell the facts of people who have committed suicide. The labeling was done by reading the full tweets manually one by one instead of observing only the keywords to increase the labeling accuracy. Out of the 9750 tweets, 3200 expressed suicide-related to COVID-19 and 3000 expressed suicide-related to other reasons. This study's main objective is sentiment analysis of suicide-related tweets whether they are Covid-19-related suicides or not. After collecting data, pre-processing was completed. Then the feature vectors are produced to apply machine learning algorithms like Long Short-Term Memory, Artificial Neural Networks and Support Vector Machine to create a forecast paradigm for suicides during the pandemic. In terms of classification, the findings demonstrated that ANN performed better than SVM and LSTM with 91.33% accuracy as well as it had higher recall, precision, f-measure, and lowest errors.

Keywords: Covid-19 Pandemic, Deep Learning, Machine Learning, Suicide, Twitter

*Corresponding author: hmrupasingha@gmail.com