A STUDY OF SOCIAL MEDIA DATA ANALYSIS FOR DETECTING THE EFFECTS ON HUMAN HEALTH

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ABSTRACT

Identifying the person's psychological well-being has become a considerable concern in recent times because of the rising awareness among people regarding mental health. Human behaviour analysis may offer valuable insights for a variety of work roles. The viability of predicting human behaviour has improved thanks to recent developments in applying data-based methods to social sciences. Because of the availability of textual data, they researched human activity by analyzing unstructured textual data has lately gotten much interest. As people grow more mindful of the importance of mental health, the diagnosis of mental disease is becoming a significant concern. Because of the complex nature of each psychiatric condition, many doctors have had difficulty recognizing the presence of mental disease in a patient, finding it impossible to get adequate care until it is too late. However, since social media has become more integrated into people's everyday lives, it has created an atmosphere in which new knowledge about a patient's psychiatric illness could be available. This analysis was carried out as a review, which is described as the process of locating, evaluating, and analyzing available resources in order to address a series of research questions. The aim of this study is to address concerns about the possibility of health issues which could occur based on the social media activity of the users.

The findings show that, it is possible to identify the distress earlier using social media activity of the users.

Keywords—Social media Influence, Human Behaviour, Linguistic analysis, Personality Traits, Mental Health, Machine Learning

I. INTRODUCTION

The action of humans is the most complicated phenomenon to understand [1]. Still, one of the most fundamental principles in the behaviour of the human is, that every particular individual can be characterized by a collection of stable features and attributes that do not vary over time [2]. People's social interactions have been conceptualized as personality characteristics, and this aggregation of consistent parameter has been abstracted explicitly as a personality. However, it has been stated that personality does not adequately describe human nature and that individuals act in unpredictable ways in various contexts.

Depression is a prevalent ailment in today's world, with many people suffering from it. Depression, according to Parekh [3], is a mental disorder that adversely affects a person's way of thought, behaving, or behaving. According to figures from the World Health Organization, there were approximately 322 million cases in 2015, with approximately 798,000 cases ending in suicide [4]. However, as serious as it can be, there is also a belief in society that possessing a psychiatric illness is a sign of failure and may lead to alienation from society. According to a survey, even though people recognize depression as a serious issue, they believe it is more difficult to handle. There are researches available, that reviews the analysis of behaviour of the user, through different physiological and biological parameters [5]. This may make those suffering from mental illnesses unable to seek psychiatric care, resulting in fewer patients receiving adequate care. Around 75 percent to 85 percent of people with depression do not get the treatment they need to overcome their illness [6]. With the emerging trend of people venting their issues on social media, this could not only provide therapists and/or counsellors with additional
insight when making judgments, but it could also open the door to early identification through data collected from the subject's social media site [7]. It has backed up by research showing that students with depression problems use the website even more than others who do not. This motivates researchers to develop the most effective approach for detecting any potential behavioral or behavioral problems early on. The aim of this research is to find and assess text-based methods that can be used to diagnose distress early in people who use social media.

II. SOCIAL MEDIA

In recent years, social media has been increasingly integrated into people's everyday lives; many people now spend hours each day on Facebook, Twitter, Snapchat, Messenger, and many other popular social media platforms. As a result, a number of academics and researchers are investigating the effects of social networks and digital applications on numerous aspects of human society [8]. Furthermore, the overall number of social media users on the planet in 2019 is 3.584 billion, up 9% over the previous year [9]. As of January 2020, a statistic in Figure 1 depicts the gender makeup of social media viewers globally, categorized by channel. Men made up just 38 percent of Twitter users, while they made up 61 percent of Snapchat users.

Females, on the other hand, were far more likely than males to utilize social networking sites such as LinkedIn and Facebook. It's tough to ignore, that social networking sites has played an important part in the lives of many individuals. While social media has many great and entertaining aspects, it may also be harmful to one's mental health. In a previous studies [10], it was shown that gender, not age, had a substantial effect on mental health. Females were found to be somewhat more likely than males to suffer from mental illness.

Figure 1. Percentage of Social Media User based on Gender in different Platforms as of January 2020

A. Effect of Social Media of Mental Health

Mental wellness is described as a time of good mental health throughout which users are aware of their abilities, solve problems in their everyday lives, perform well, and make positive connections with other people [11]. There is now a debate on the advantages and disadvantages of social media in terms of mental health [12]. The importance of social networking in maintaining our mental health cannot be overstated. Death rates, medical conditions, mental, behavioral, and physical health are all affected by the quantity and nature of social connections [13]. The Displaced Behavior Theory may shed light on why social media and mental health are so closely related. According to the hypothesis, persons who engage in sedentary behaviors, such as utilizing social networking sites, spend less time engaging in face-to-face social connection, which can help avoid mental diseases [14, 15].

Psychological theories, on the other hand, indicates that social networking activity has an impact on mental health by affecting how people interpret, organize, and engage with their social media networks. Aggressions on social media can occasionally disrupt social stability. Many times, a crisis can spiral out of control, disrupting law and order and perhaps resulting in the loss of life and public property. As a result, detecting and controlling these aggressions on social networking platforms is critical. There are studies available that aims to conduct a thorough review of the numerous research studies conducted on the field of detecting aggressiveness in social networking sites [16]. Excessive usage of social media sites like Facebook has been linked to poor mental health difficulties, anxiety, and weariness, according to a number of studies. Furthermore, new networking will put a lot of pressure on people to conform to stereotypes that some people want to see in order to be as popular as others.
B. Need of the Study

To provide a warm and accurate response to the research questions, systematic studies should identify, aggregate, and interpret all available data in both quantitative and qualitative ways. In addition, several existing systemic studies in mental health have been carried out all around the world. However, since most of the available research is focused on medical research, only a limited percentage of studies are mixed with social media and conducted in the spirit of modern science. There have not been many studies into the potential links between social media use and mental health because social media is such a new phenomenon.

This paper aims to critically review all existing research to fill the vacuum by examining the impact of social media on mental welfare, which is sedentary behaviour that, when done in excess, raises the likelihood of health problems. Because we live in the digital world, social networking platforms (SNS) are frequently used to share information, events, and even emotions. As a result, it has played a critical role in real-time analysis and has been utilized to make speedier trend forecasts in various fields. Opinion Mining [17] [18], Crop Prediction [19], for content analysis over social network [20], neurological disorder [21], emotion detection [22], online product review [23], sentiment Analysis [24] [25] [26], are just a few examples of the topics covered. In the field of public health, it has the potential to be a valuable resource for disease surveillance and a reliable means of communication in the case of a disease epidemic. Early diagnosis of diseases such as heart disease and diabetes, for example, can help to mitigate their adverse effects on human health. The use of social media data to detect human illnesses might aid in detecting early warning signs. Data from social media users may be utilized as benchmarking data, which may be evaluated for early trend identification and forecasting. The purpose of this research is to review the available tools, methodologies, frameworks and approaches for forecasting illness potential using social media data. The presented study is significant because it shows the extent to which academic science literature can assist scholars in posing potential concerns regarding mental health treatments that need consideration. What effects might social media have on mental health? It is the leading research question that influenced the progress of this systemic study.

III. REVIEW OF LITERATURE

The study included in the present research were chosen to represent existing approaches and methodologies for predicting potential health risks using social media data. The methodologies and procedures that have been investigated are from the last several years.

The cognitive and affective mechanisms underpinning the process by which people’s risk perceptions and preventative activities are shaped by exposure to hazard information on social media are explained in this study [27]. According to the findings, fear and fury, two self-relevant emotions, influence the links between social media exposure, personal-level risk assessment, and preventative behaviors. The data support the differential impact theory, which states that social media coverage while on a communicable disease breakout might evoke strong self-relevant emotions, which can lead to increased risk perception and prevention activities at the individual level.

This study [28] looked on the relationships between social media use, social support, depression, and overall psychological disposition among people with movement or mobility impairments in Korea. The impacts of social networking sites use on social support as well as their impact on general psychological temperament were comprehensively examined. According to the findings of hierarchical regression analyses, both the degree of SNS usage and the usage of online communities strongly predicted functional, factual, and evaluative support, but not emotional support. Further regression and Sobel tests revealed that, through the mediation of instrumental and informational support, higher degrees of intensity of SNS usage and online community usage both related to reduced levels of depression. The interviews also highlighted the benefits of using social media to foster social support and promote favorable psychological attitudes. However, the study found that persons with physical impairments have some disadvantages and limits when using social media.

This study [29] looked at the bi-directional association between teens’ usage of social media, particularly social networking sites, and anxiety and sociality. Four important subjects in Social Media usage emerged from thematic analysis of the articles reviewed: number of Social Media use, quality of Social Media use, social components connected with Social Media use, and revelation of mental health symptoms. Longitudinal designs, objective and timely evaluations of Social Media use, research on the processes underlying the relation between Social Media usage and depression and sociality, and clinical population research to inform therapeutic treatment
would all benefit research in this field. This heightened interest has resulted in a wide spectrum of research, from observational to experimental and qualitative studies based on interviews or social media content analysis, as well as systematic investigations. The purpose of this scoping study was to evaluate the breadth of research in the domains of depression and Social Media (with a focus on SNS), as well as to identify research gaps. As four key study concerns, (1) the volume of Social Media usage, (2) the quality of Social Media usage, (3) social components associated with Social Media usage, and (4) Social Media as a medium for disclosure of depressive symptoms and potential for prevention and detection of depressive symptoms outcomes were highlighted.

The author of this research [30] investigates the effect of interpersonal interaction on offline dynamics in order to better understand human behavior in the real world. The author introduces Social Impact Deep Learning (SIDL), a framework for modeling social influence and forecasting social actions on real-world community events an event or visiting a site that integrates artificial intelligence with network theory. The author proposes many ways with differing degrees of network connections with the goal of addressing two common deep learning challenges: interpretability and scalability. They used data from Plancast, a networking site, and Twitter, a social network, to confirm and assess our techniques. Finally, the author examines the use of several deep learning architectures, as well as the relationship between various influence and user privacy, offering findings as well as some cautionary remarks regarding the dangers of revealing sensitive data.

The author of this study [31] investigates the influence of supposed influence (IPI) theory, which says that people's presumption of media impacts influences their desire to engage in risky behaviors (e.g., smoking) through altering their normative perspective of such activities. This study examines how anticipating media effects improves health preventive activities in young adults by using the IPI theory to media content for health promotion. Furthermore, three health behaviors were used in this study to examine the IPI functioning channels in response to different types of preventative activities (i.e., ambiguity and privacy). According to the findings, one's impression of the influence of health promotion media material on others increases one's propensity to engage in beneficial lifestyle behaviors such as safe sex, nutrition and health, and skin cancer prevention. Furthermore, the data show that cultural traditions act different ways depending on the type of activity.

With the use of the Agglomerative Clustering methodology, this research [32] suggests a method in which tweets, which have been gathered and pre-processed, may be successfully vectorized and grouped into the relevant illnesses. The tweets may also be shown using their geo-location information to create disease-infested zones. Early detection of disease outbreaks might be aided by such a monitoring system, which would allow for faster and more effective response. To analyze and extract insights from tweets, the authors utilized a technique of obtaining and pre-processing tweets. The use of Word2Vec to construct sentence vectors, which could then be utilized to represent tweets, has also been suggested. The tweets were clustered into distinct illnesses using a combination of agglomerative, K-Means, and spectral clustering approaches, with the results compared.

The author proposes in this research [33] a framework for assessing if the stress of a client is closely connected to those of a friend of his or her social network partners and the use of a large-scale social-stage information sheet to examine the association between the stress level of a client and social connections. We first establish a range of literature, visual and social characteristics relating to pressure from multiple angles, and then utilize a convolutional neural network (CNN) to extract topics. Following the organization of points, we can utilize CNN to examine a Facebook post in conclusion. The commitment task uses the bolster vector approach to determine if clients are being pushed or not (SVM). Once the focus of consumers has been determined, the KNN calculation is used to propose a medical clinic on the map and the administrator may provide the customers with summary insurance letters to keep them healthier and happier in their everyday life.

The purpose of the author's research [34] is to explore if statements on Facebook and twitter might be utilized to categorize people depending on their personal wellbeing. Researchers present an artificial intelligence-based strategy that uses Twitter as a data source and screening tool to identify people based on their UGC on SNS. To classify Support Vector Machine (SVM) and Nave Bayes, we devised an approach that employs two different classifiers.

This research [35] aims to investigate new developments in Mental Health and Behavioral Research (MHR) that place a focus on co-existing illnesses that lead to comorbidity. We describe a unique methodology in which statistical analysis is used to compare personality features inferred from opinionated information of individuals and overall social users. Our Behavioral Disorder Identification (PDD) algorithm is responsible for this.
Furthermore, in our Addiction Category Determination (ACD) system, social media data of individuals displaying personality features of patients is exposed to semantic based text categorization utilizing Natural Language Processing (NLP) and Ontology Based Information Extraction (OBIE).

Kenny Here proposed a method for reliably classifying data using dengue keywords in [36]. They have demonstrated how the development in the number of influenza cases in an area can be precisely anticipated, as well as how the transmission of influenza can be intensely scrutinized in a few cities using a web-based mapping application.

Using K-means clustering, the author [37] provided a strategy for obtaining Twitter data, preparing it, and spatially grouping it (clustering the tweet based on geographical co-ordinates). To showcase the final goal, the influence and effort put into social media platforms should be quantifiable. There have been studies [38] that try to determine the most important qualitative and quantitative measures for measuring the efficacy of social media marketing.

In [39], researchers demonstrate how Twitter data can be used to establish a scalable intelligence apparatus for flu and cancer detection using spatial, temporal, and textual analytics. Their work uses complicated systems to effectively represent the Flu activity in the form of either an active US Communicable Disease Map, a diffusion of various flu and cancer symptoms and treatments, and a timeline of the amount of flu and cancer-related tweets. Their technology may be used to detect an increase in the number of incidences of illnesses such as the flu early on, as well as to monitor patients with various cancer kinds and the therapies they choose.

IV. DISCUSSION

Social media is becoming a fundamental part of adolescent years, with both potential benefits and threats to mental health, which are yet little understood. According to the above discussed literature, social media has a significant influence on human psychology and emotions [40]. There has been minimal research proving teenagers' opinions on social media, specifically their opinions on social media and mental health. There are number of literatures available that worked upon the data obtained by the user's social media activity for analyzing the emotions, sentiments and psychological stress of the user. But there is no existing study available relating the user's social media activity and health. It creates and opportunity to develop a system or methodology which can be used to predict the issues related psychological as well as philological health of the user, by analyzing the social networking activity.

V. CONCLUSION

We explore prediction methodology including the use of social media activity in the prediction and analysis of human behavior, as well as its impact on human health, in this study. The written study attempts to imply that numerous prediction models may be utilized to forecast a likely outcome; nevertheless, these models rely only on the social network's dysfunctional information. Different machine learning algorithms can leverage the channel to offer current input while also detecting disease outbreaks faster and more accurately. Some elements can be considered critical in creating an accurate forecast for the probability of epidemics or disease. The forecast's accuracy, as well as its magnitude and duration, are critical. Based on the results of the survey, we discovered that machine learning approach outperforms traditional methods in forecasting epidemic breakout among a large number of research projects. As a result, more research and planning is required in these areas.

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