

# Pattern Of Social Media Usage During Covid-19 Sentiment Analysis Of Twitter; A Study Of China, India And Pakistan

Nadia Saleem<sup>1</sup>, Saba Sadiq<sup>2</sup>, Tayyaba Saeed<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Mass Communication, Virtual University of Pakistan Lahore.

<sup>2</sup>Lecturer, Department of Mass Communication, Virtual University of Pakistan Lahore.

<sup>3</sup>Lecturer, Department of Mass Communication, Virtual University of Pakistan Lahore.

---

## Abstract

The Corona virus was identified in Wuhan city of China in the last month of 2019. The disease caused by Corona virus was named as COVID-19 by World Health Organization (WHO). COVID19 outbreak was declared as a pandemic in March 2020 by WHO. Originating from China, this virus spread all around the world resulting into thousands deaths in USA, Iran and many European countries especially in Italy, Spain. In Pakistan, the first case of Corona was diagnosed on February 26, 2020. The threat to human lives by following daily routine had resulted to complete lockdown in many countries. Due to limited mobility and restricted socialization in this lockdown, people have become more dependent on social media to express and to share their feelings. This research explores the pattern of social media usage in Pakistan, India and China through sentiment analysis of the tweets. This research has been conducted to analyse how the common people in these three countries are handling this exceptional restricted daily routine. The tweets of Twitter users in China, India and Pakistan were collected, managed, and studied through sentiment analysis. The results of this study show that tweeters in India and Pakistan have more positive approach while discussing Covid-19; whereas, tweeters in China showed more negative sentiments of panic, grief and repulsion.

**Keywords:** COVID19, Corona Virus, Social Media Usage, Twitter, Sentiment Analysis

## Introduction

Social media is a key source of information in 21<sup>st</sup> century. The popularity of social media has increased over the time especially Facebook and Twitter are considered strongest social networking sites among the masses (Sharma, Seo, et al., 2020; Medford, et al., 2020; Sharma & Goyal, 2018). Social media has great impact on political and social movements. Social media is not liable for igniting the insurgencies only it has also been established as a source to establish conclusions, both positive and negative, due to fast and interactive nature of communication. The

use of social media is important to get awareness and to prevent or control the disastrous situation. This study examines the use of social media tools particularly Twitter in China, India and Pakistan during corona crisis. The responses of social media users explain some of the key factors related to Covid19 discussions.

Social media users may also consult their social community to seek advice regarding physical and mental health during corona crises. Twitter has been used not only for dissemination of news and information, but also for creating awareness as a tool for crisis management. Keeping in view, the importance of this social medium in crisis management cannot be ignored. Among social media, Twitter is the most significant and credible form in two-way communication (Goodair, 2016). According to Pew research center of America in 2019, 2.95 billion people are users of social media which will be increased in future that is remarkable and highly influential. However, rumors and fake news in shared content is the dark side of social media, such rumors and false claims can be harmful and panic among its users (Mourad, A., et al., 2020).

COVID-19 outbreak has threatened all the countries of the world. In this global crisis, social media has played vital role to disseminate the precautions and basic information to curb this pandemic. Tweets of the government, non-government officials, organizations and celebrities build public opinion and create awareness regarding this pandemic. It has been observed that celebrities are more concerned to talk about the pandemic situation of COVID-19 on Tweet. They guided and insist to follow the instructions and safety measures through different informative tweets. Information shared by the celebrities or public figures have a strong impact on the mind of the public, they can guide and educate regarding any crises or pandemic influentially (Fang, Gao, & Li, 2020).

### **Research Objectives:**

The research objectives are:

- To examine the use of Twitter by Social Media Users for corona crisis preparedness, its response and crisis recovery
- To find out if there is any difference between the sentiments of social media users in China, India and Pakistan.

### **Literature Review**

Sentiment analysis of Twitter posts has gained a lot of traction with researchers worldwide. With an on-going pandemic like COVID-19, it has become a go to tool to assess the opinions of masses and governments regarding various aspects of this global phenomenon.

As explained by Tsytarau and Palpanas (2012), a sentiment analysis is aimed at detecting the presence of sentiment polarity. It is used to assign a positive or negative sentiment based on the

opinion expressed in the text. Pang and Lee (2008) have referred to sentiment analysis as the “computational study of opinions, feelings and subjectivity in text.”

A big pool of research is available regarding various methods and techniques employed for conducting a sentiment analysis for Twitter datasets. Agarwal et al., (2011) referred to a specific model to study the sentiment analysis of twitter. They employed a binary task to designate sentiments into positive and negative categories. Liu and Zhang (2012) have also given detailed insights into the various concepts related to this particular technique.

Kharde and Sonawane (2012) have applauded sentiment analysis as a perfect tool for opinion mining from the short and varied texts such as those found on Twitter. In their study, Giachanou and Crestani (2016) have listed various method and techniques for conducting a sentiment analysis based on their approaches and categorizations.

The new world that has emerged in post COVID-19 era has highlighted the importance of virtual connection. With the lockdowns, restrictions and social distancing in place, micro blogging platforms like Twitter have become all the more important. This phenomenon has increased the interest of researchers to study the sentimental aspects of the twitter users’ life in the times of corona.

As more and more people are relying on social media these days, the spread of misleading information and news about Corona has become an important issue. Not only is the spread of such information morally wrong; but it can also pose a serious threat to public health.

To tackle this issue, Sharma et al., (2020) have worked on a special dashboard that tracks the misleading information on Twitter regarding Corona. In addition to pointing out and separating the clear misinformation, the dashboard also track user sentiments regarding the various policies put in place due to Corona.

Mouard et al., (2020) have also studied the plethora of information that has flooded the social media following the pandemic of Covid-19. Calling it an ‘infodemic’, the study used a huge dataset of one million tweets related to the Corona pandemic. The study has used various techniques including sentiment analysis, to pinpoint the importance of check and balance on misleading information. It also highlights the importance of social media in bringing out both positive and negative sentiments of connectedness and loneliness in its users.

In a similar context, Pei and Mehta (2020) have used sentiment analysis to highlight the emerging racism and xenophobia on Twitter. Their study highlights the negative sentiments attached to various racist hashtags that have spiked in the wake of Covid-19. They have linked the increasing negative sentiments to various stages of spread of Corona virus. The study was aimed at controlling the racism and deal more effectively with this public health crisis.

Researchers have also been interested in understanding the sentiments of public over the idea of lockdowns and restrictions. Barkur et al., (2020) found that the twitter users of India were

satisfied with the measures taken by their government for tackling the Covid-19 pandemic. The sentiment analysis revealed mostly positive sentiments towards the idea of lockdowns.

Similarly, Alhajji et al., (2020) have also done a sentimental analysis of KSA twitter users to find out their response regarding governmental policies on Corona. However, Dubey (2020) went for a more international approach. He found out that the people from various countries tweeted negative sentiments like fear and desperation in relation to the social distancing and lockdown protocols.

Samuel and Ali (2020) went on to perform a sentiment analysis of the fear factor of twitter users. Their study revealed that with the pandemic hitting peak in various countries, the sentiment of fear has also seen a sharp rise in the tweets from all around the world.

Concerning the sentiments of public over lockdown, Ahmed et al. (2020) have used the sentiment analysis to gauge the reaction and opinions of USA masses towards the re-opening phase after the lockdown. They found that the general sentiments of Twitter users were less negative towards the idea of re-opening as compared to lockdown.

Cheema and Riaz (2020) employed sentiment analysis to study the mental well-being of twitter users following the pandemic. They found out that the sentiments of masses were ranging from pole opposites of hope and positivity to panic and chaos.

The research carried out over Corona in last few months is ever-increasing. Ranging from topics of information, mishandling to racism and governmental policies, researchers are employing sentiment analysis to understand the masses better.

The following study aims to examine the social media usage of the people by running a sentiment analysis of the tweets done by social media users regarding Covid-19. It also aims to highlight the sentimental value attached to the words of those yielding power and prominence, in the management of this public health crisis.

## **Research Methodology**

Twitter has become one of the most popular social networking platforms after its launch in 2006. Initially, the users could express their thoughts within the limit of 40 characters in a tweet, but later this limit was extended to 280 characters for one tweet. At present, there are more than 330 million users are active on twitter, who tweets on daily basis (Dubey, 2020). Twitter is being used to share the thoughts and opinion of users, as well as for dissemination of the information. Twitter has emerged as a rapid source of opinion sharing; and has established as a topic of interest for modern researchers that how the tweeters are expressing their sentiments towards a particular phenomenon.

As human emotions cannot be studied under one accepted psychological theory, most of the researcher criticizes that human sentiments cannot be categorized as simple as positive and negative ones. Similarly, it is also believed that the systematic mechanical sentiment analysis do

not cover all aspects of human emotions, so there is a need to adopt extremely tuned procedures to study the human emotions in detail. In their research work, Mohammad and Turney (2012) have followed the same lines, where they analyzed the tweets on Putchik's basic emotion model along with the basic sentiment analysis at positive and negative level (Dubey, 2020).

Overall, 5,000 tweets were collected from Pakistan, India and China. Tweets were collected by using Mozdeh Big Data Analysis. The keywords used for collecting the tweet were "COVID19, CORONAVIRUS, CORONA, STAY HOME STAY SAFE and COVID19 Pandemic". Theretweets and replies were excluded to avoid the repetition country Wise. Tweets from 21<sup>st</sup> March to 21<sup>st</sup> June 2020 were studied in this research. It was done also to minimize the chances of duplication of tweets.

At first step, complete data was collected; on second step; the data filtering process was performed. Then, the collected tweets were corrected grammatically. After the completion of these steps process, the tweets were analyzed through sentiment analysis. Once the tweets were analyzed quantitatively in two categories of negative and positive sentiments, the word cloud for each country was developed.

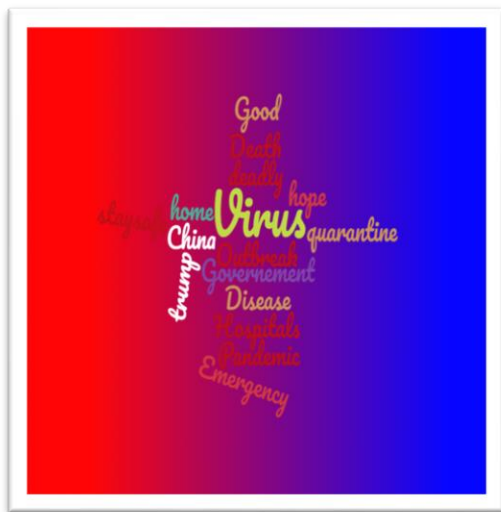


Fig 01: Word cloud of Tweets from India  
China

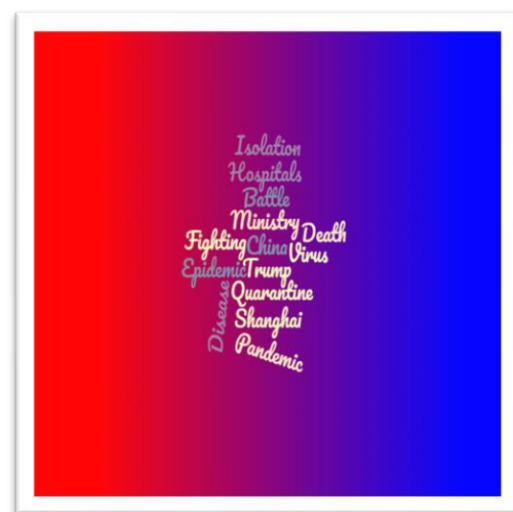


Fig 02: Word cloud of Tweets from  
China

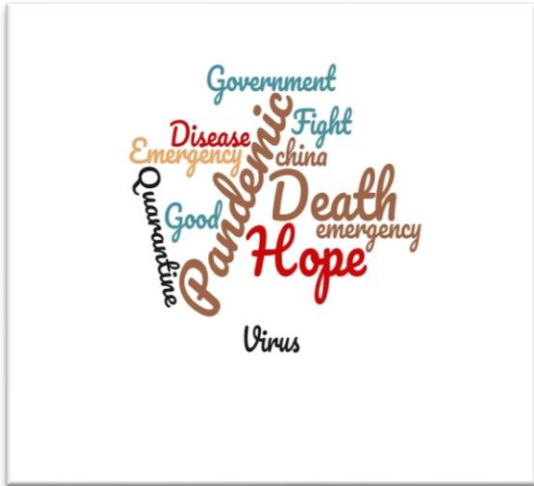


Fig 03: Word cloud of Tweets from Pakistan

### Results

The data was analyzed in two steps. In the first phase, the sentiments analysis was done for the tweets from the selected 3 countries. Figure 04 shows the intensity of sentiments in selected tweets that have been done by the tweeters of the three countries included in the sample. As it is evident from the figure that the ratio of positive sentiments was highest among the Indian with almost 67% and only 33% had negative sentiments. India was followed by Pakistan where 59% of the posted tweets had dominant positive sentiments while 41% tweets had negative perspective. China, on the contrary, had more people who were tweeting with negative sentiments (55%).

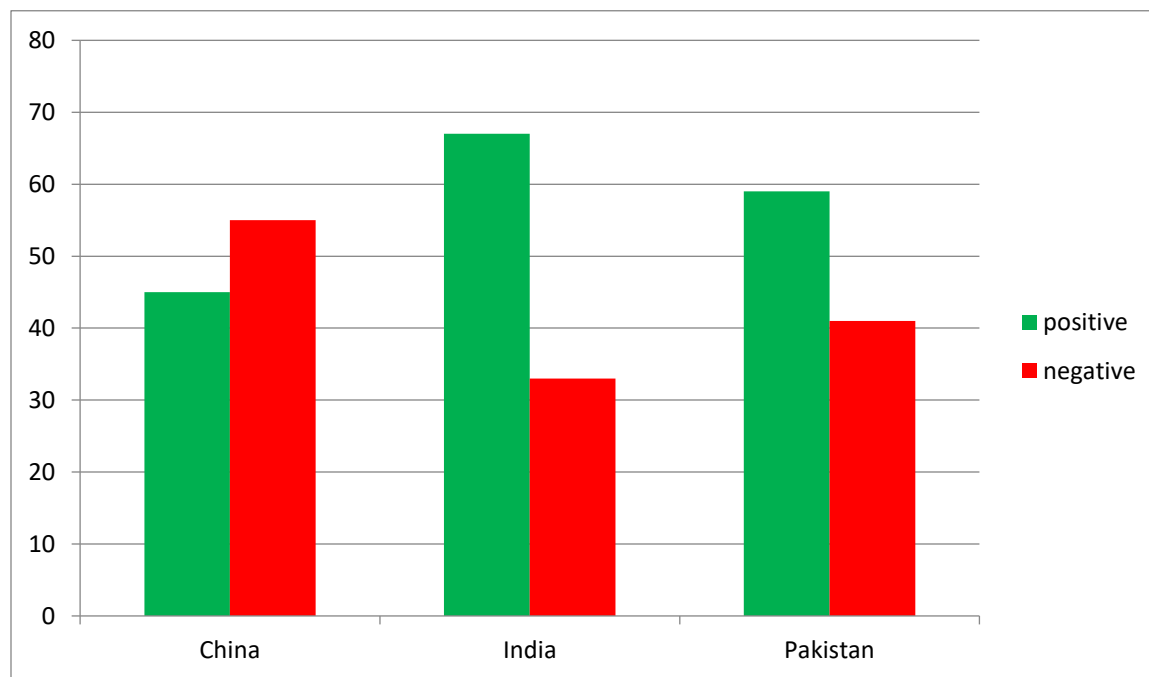


Fig 04: Sentiment Analysis of Tweets in China, India and Pakistan

After analyzing the tweets through sentiment analysis, the associated emotions in these tweets were analyzed. In this process, it was observed that the highest numbers of tweets were reacted with trust, followed by anticipation, sadness, anger, surprise and disgust. The positive emotions of joy and trust which attributed to the various jokes and memes that may have been shared by the users in lockdown.

Country	Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust
China	10.67%	17.30%	4.35%	21.38%	6.16%	10.17%	5.56%	24.41%
India	9.69%	16.63%	4.62%	18.72%	12.45%	10.16%	6.53%	21.20%
Pakistan	8.47%	17.00%	5.12%	17.23%	11.12%	11.92%	7.28%	21.87%

Table 1: Emotion Analysis of the tweets from each country

The collected tweets were systematized to form word clouds for analysis of the frequencies of words frequently used by the tweeters of China, India and Pakistan. Figures 01, 02 & 03 show that words like Pandemic, Disease, Hospital, Death, Virus, Fight, Hope, Stay Safe, Quarantine and Emergency were very often shared by the users of each country. There was a significant mention of these words in the tweets collected from China, the origin point of COVID19 in Wuhan city.

In Pakistan words like Pandemic, Government, Good, Hope, Death and emergency were most used words with the emotions of anticipation and fear respectively. China witnessed the usage of words like Pandemic and Epidemic mostly connected with the sentiments of grief, sorrow and revulsion. Similarly, people in China tweeted most by using the word Pandemic, Epidemic, Death, Disease and Infection with fear and disgust emotions the most. Citizens of India used the word Fight and Stay Safe more frequently, and these words were associated with emotions of Anger and Joy. This trend in India and Pakistan may be attributed to the fact that both countries were at earlier stages of COVID19 stages and have been locked down much earlier as compared to China.

It is interesting to mention that tweeters from China, India and Pakistan frequently used to mention US and US president Donald Trump. The data shows that most of the mentions were associated with the emotion of surprise. It can be assumed that this emotion is consistent with the US President owing to his no-lockdown policy in US despite of hundreds deaths as the cases have exceeded to hundred thousand.

## **Discussion**

Due to limited mobility and restricted socialization in this lockdown, people have become more dependent on social media to express and to share their feelings. The study explored the nature and diversity of the sentiments of social media users on Twitter platform regarding COVID19 pandemic. The first objective of the study was to examine the use of Twitter by Social Media Users for corona crisis preparedness, its response and crisis recovery. The data analysis shows that people use Twitter to respond to the changing situation regarding this pandemic. There were sentiments of fear, disgust and sadness as number of deaths increased. People used words like Death, Hospital, Emergency that shows the emotion of Fear which is natural in a time of Pandemic. On the same time, people seemed hopeful and showed trust towards preventive measures taken in their countries. Use of words Hope and Fight was the sign of positive attitude of Twitter users. The Joy sentiment was also there although comparatively low, but the results show that users expressed all their sentiments related to Corona Virus crisis.

The second objective was to find out if there is any difference between the sentiments of social media users in China, India and Pakistan. Data analysis results show that twitter users in India were most positive during the said time of Corona crisis (March 21 to June 21, 2020); followed by the users in Pakistan. People in China were least positive regarding this pandemic. The reason behind this difference may be the difference in stage of Corona pandemic in these countries. People of China have been facing this crisis for more time than India and Pakistan.

## **Conclusion**

The main objective of this research was to analyze the pattern of social media usage of people during Covid-19 that whatkind of sentiments they are expressing during this crisis time period. It has been revealed that people in India and Pakistan used to express positive sentiments about COVID19; whereas, in China, people were most scared and exhibited more negative sentiments about the same. Similarly, while analyzing the word clouds of different countries, it was concluded that people are tweeting negative words like Pandemic, Death, Quarantine and Fight; positive words of Hope, Stay Safe, safety, and life; and neutral words of Government, Political and Masks. It was interesting to find out that same words were used with different emotional context. It was also interesting that US was also discussed frequently in Covid-19 tweets with reference to American president.

## **Limitations**

One of the major limitations of the study is that tweets from only three countries have been studied for sentiment analysis regarding Corona Virus. A more in-depth analysis can be done by extending the study to more countries. A deep insight into sentiments of facebook users regarding Corona Virus can be taken to have a comparative analysis of both social media platform. As



sentiment analysis is not a complete replacement of survey responses so results of sentiment analysis can be verified by applying survey method as well.

## References

- Agarwal, A., Xie, B., Vovsha, I., Rambow, O., & Passonneau, R. J. (2011, June). Sentiment analysis of twitter data. In Proceedings of the Workshop on Language in Social Media (LSM 2011) (pp. 30-38).
- Anastasia Giachanou and Fabio Crestani. 2016. Like it or not: A survey of Twitter sentiment analysis methods. *ACM Comput. Surv.* 49, 2, Article 28 (June 2016), 41 pages.
- Alhajji, M., Al Khalifah, A., Aljubran, M., & Alkhalifah, M. (2020). Sentiment Analysis of Tweets in Saudi Arabia Regarding Governmental Preventive Measures to Contain COVID-19.
- Bing Liu and Lei Zhang. 2012. A survey of opinion mining and sentiment analysis. In *Mining Text Data*. Springer, New York, NY, 415–463.
- Chouchani, N., & Abed, M. (2020). Enhance sentiment analysis on social networks with social influence analytics. *Journal of Ambient Intelligence and Humanized Computing*, 11(1), 139-149.
- Dubey, A. (2020), Twitter Sentiment Analysis during COVID19 Outbreak Available at SSRN: <https://ssrn.com/abstract=3572023> or <http://dx.doi.org/10.2139/ssrn.3572023>
- Fang, W., Gao, B., & Li, N. (2020). Analysis of the Influence of Opinion Leaders on Public Emergencies through Microblogging. *Open Journal of Social Sciences*, 8(5), 154-158.
- Goodair, C. Life as a Tweeter. *DISPLAYING HISTORY*, 20.
- GopalkrishnaBarkur, Vibha, and Giridhar B. Kamath. 2020. Sentiment analysis of nationwide lockdown due to covid 19 outbreak: Evidence from india. *Asian Journal of Psychiatry*, 5
- Hussein, D. M. E. D. M. (2018). A survey on sentiment analysis challenges. *Journal of King Saud University-Engineering Sciences*, 30(4), 330-338.
- Hyder, A. (2020). SHORT NOTES ON THE ECONOMY DURING THE COVID-19 CRISIS.
- Kharde, V., & Sonawane, P. (2016). Sentiment analysis of twitter data: a survey of techniques. arXiv preprint arXiv:1601.06971.
- MikalaiTsytsarau and Themis Palpanas. 2012. Survey on mining subjective data on the web. *Data Min. Knowl. Discov.* 24, 3 (2012), 478–514.
- Medford, R. J., Saleh, S. N., Sumarsono, A., Perl, T. M., & Lehmann, C. U. (2020). An "Infodemic": Leveraging High-Volume Twitter Data to Understand Public Sentiment for the COVID-19 Outbreak. medRxiv.

- Mourad, A., Srour, A., Harmanani, H., Jenainatiy, C., & Arafah, M. (2020). Critical Impact of Social Networks Infodemic on Defeating Coronavirus COVID-19 Pandemic: Twitter-Based Study and Research Directions. arXiv preprint arXiv:2005.08820.
- Mohammad S, Turney P. Nrc emotion lexicon [Internet]. 2013 [cited 2020 Apr 3]. Available from: <http://www.saifmohammad.com/WebDocs/NRCemotionlexicon.pdf>
- Pei, X., & Mehta, D. (2020). # Coronavirus or# Chinesevirus?!: Understanding the negative sentiment reflected in Tweets with racist hashtags across the development of COVID-19. arXiv preprint arXiv:2005.08224.
- Plutchik R. The Nature of Emotions. American Scientist. 2001;89(4):344.
- Samuel and M.M.; Esawi E.; Samuel Y. Ali, G.G.M.N.; Rahman. Covid-19 public sentiment insights and machine learning for tweets classification.
- Sharma, S. K., Hoque, X., & Chandra, P. (2020). Sentiment predictions using deep belief networks model for odd-even policy in Delhi. In Cognitive Analytics: Concepts, Methodologies, Tools, and Applications (pp. 1440-1463). IGI Global.
- Sharma, K., Seo, S., Meng, C., Rambhatla, S., Dua, A., & Liu, Y. (2020). Coronavirus on social media: Analyzing misinformation in Twitter conversations. arXiv preprint arXiv:2003.12309.
- Sharma, A., & Goyal, M. A. Tweet, Truth and Fake News: A Study of BJP's Official Tweeter Handle.
- Tsytarau, M., & Palpanas, T. (2012). Survey on mining subjective data on the web. Data Mining and Knowledge Discovery, 24(3), 478-514.