Analyzing the impact of internet usage on depression and anxiety

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ABSTRACT

This study examines the impact of internet and social media usage on the global prevalence of depression and anxiety. As global internet connectivity rises, questions arise about its correlation with mental health trends, particularly among adolescents. This study explores whether the adoption of internet technology correlates with higher rates of reported depression. Using public datasets from The Institute for Health Metrics and Evaluation (IHME) and Our World in Data (OWID), the analysis employs Python tools like Pandas and NumPy for exploratory data analysis, SciPy-Stats for regression modeling, and MatPlotLib for visualization. Findings reveal no significant impact on anxiety prevalence but rather suggest a minimally positive correlation between increased internet usage and depression among youths less than 20 years of age, as well as a weak positive correlation between average global social media time spent and depression.

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KEYWORDS

Internet, social media, depression, anxiety

1 Introduction

The use of the internet and social media has become an integral part of modern life, largely reshaping our communications, work, and culture. However, this transformation in society has raised concerns about its potential effects on mental health, particularly on the impressionable youth. Understanding the underlying causes of depression and anxiety is vital for developing effective prevention strategies.

Due to the relatively recent adoption of internet and social media technologies, research in this topic is not definitive. Studies in this topic suggest a strong link between excessive internet and social media usage and mental health issues, especially among the youth. For instance, an article of the Journal of Abnormal Child Psychology found that acts of social comparison and reassurance seeking performed on social media led to depressive symptoms among adolescents [4]. Another article of the Adolescent Research Review journal found that exposure to beauty ideals propagated through social media among young adults, both male and female, has shown an increase in body dysmorphia [1]. These concerning findings have led healthcare organizations such as the American Psychological Association (APA) and the United States Surgeon General to issue health advisories warning the issues that may arise with youth social media usage [2].

With the purpose of contributing to the topic, this study explores whether the widespread adoption of internet technology and increased social media consumption is associated with rising rates of depression and anxiety globally. Additionally, individual age groups will be analyzed to determine whether the issue is widespread, or more localized to a particular demographic. By leveraging datasets from the Institute for Health Metrics and Evaluation (IHME) and Our World in Data (OWID), the research analyzes trends in depression prevalence worldwide to answer the proposed questions.

2 Data

To answer the questions presented by this topic the following datasets will be used:

1. Select data from the 2021 Global Burden of Disease study by the IHME that records various measures such as percentage of population with anxiety and major depressive disorders, from 1990 to 2021 [3]
2. Dataset provided by OWID showing the global share of population using the Internet, from 1990 to 2021 [x]
3. Dataset provided by Statista highlighting average time spent on social media in minutes from 2014 to 2024 [x]
4. Select data from the same source of Dataset 1 that exclusively selects the same data for the United States [3]
5. Internet usage distribution across the United States by age group provided by the Pew Research Center from year 2000 to 2024, excluding the years 2017, 2020, and 2022 [x]

2.1 Source of datasets

Datasets 1 and 4 were obtained from the IHME’s website under the condition that it is used for non-profit purposes. The IHME is an independent public research institute based in the University of Washington and trusted as a reputable source. It is a subset of data selected from a larger dataset that compiles findings from the 2021 Global Burden of Disease study.

Dataset 2 comes from data collected by the World Bank that was processed by OWID. The OWID are non-profit organization that selects credible data to present.

Dataset 3 includes data from We Are Social, a social media marketing agency, and is prepared by Statista, a reputable organization specializing in data gathering.

Dataset 5 comes from the Pew Research Center, a reliable, nonprofit, and unbiased fact tank based in Washington D.C.

2.2 Characteristics of the datasets

A screenshot of a computer

Description automatically generated

Figure 1: Excerpt of the datasets; pictured left is anxiety/depressive disorder prevalence; pictured right is internet usage percentage

All datasets are stored in Excel files. Dataset 1 is split into two sheets – anxiety and depressive disorders prevalence worldwide, and by individual country; pictured in Figure 1 is the individual country variant. Datasets 1 and 2 are joined on the basis of country name, while Dataset 3 is joined solely by the year.

Due to discrepancies in the naming conventions between the datasets, proper data cleaning was performed to ensure the similarity of country names by taking the difference of each named country in the “location” column and renaming accordingly. All data cleaning and pre-processing were performed using Microsoft Excel.

Another caveat with the data formatted was the differing bin sizes between Datasets 4 and 5. Dataset 5 used wider bins for age groups than Dataset 4. Because of this, multiple smaller bins for Dataset 4 had to be combined by averaging their values. Additionally, since the age bins of both datasets do not perfectly align, this unfortunately introduces some uncertainty to the accuracy of the data.

3 Methodology

In this part, you should give an introduction of the methods/model. First, what’s the method/model. What’s the assumption of this method/model. What’s the advantage/disadvantage of this method/model. Why did you choose it. What Python module or function do you apply to apply this method/model. Any optional input/extra work did you adjust to make the results better. If you have multiple methods, feel free to use subsection 3.1, 3.2, 3.3, … to separate them.

3.1 Importing data into Python

3.2 Blending data using Pandas joining

…

Example format: The updated template, user manuals, samples, and required fonts, all are available at the URL <https://www.acm.org/publications/proceedings-template>. It contains said information for all three versions of MS Word (Windows and 2 versions of Mac). There are also separate links to the user guide, which can be referred to by the user. This URL also contains some useful video links, which describe how to add the template, structure the paper, and generate the layout, in different clips. **Display Formula with Number**

 (1)

**Continuation part of Paragraph Text** The user must style this paragraph in **ParaContinue** style, which follows immediately after the **DisplayFormula** (numbered equation). The **DisplayFormula** style is applied only in case of a numbered equation. A numbered equation always has a number to its right. Insert paragraph text here. **Display Formula without Number**



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Figure 1: Figure Caption and Image above the caption [In draft mode, Image will not appear on the screen]

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3.3 Fitting a model using NumPy

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4 Results

In this part, you need to select a reasonable way to deliver the result of your topic. For example, equation or numerical results, or visualization of your result. You also need to provide a clear explanation of all results and how to understand the results. If there exist any unexpected results, please explain why or possible cause of this special result. You can use subsection 4.1, 4.2, … to separate your results.

4.1 Heading Level 2

Example format: In the below paragraph, it is explained how alt-txt value is placed in **MS Word 2010**. To add alternative text to a picture in Word 2010, follow these steps:

1. In a Word 2010 document, insert a picture.
2. Right click on the inserted picture and select the **Format Picture** option.
3. Select the **Alt Txt** option from the left-side panel options.
4. In the "Title:" and "Description:" text boxes, type the text you want to represent the picture, and then click "Close".

Below are steps to place alt-txt value in **MS Word 2013/2016**. To add alternative text to a picture in Word 2013/2016, follow these steps:

1. In a Word 2013/2016 document, insert a picture.
2. Right click on the inserted picture and select the **Format Picture** option.
3. In the settings at the right side of the window, click on the "Layout & Properties" icon (3rd option).
4. Expand **Alt Txt** option.
5. In the "Title:" and "Description:" text boxes, type the text you want to represent the picture, and then click "Close".

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5 Discussion

Every method/project has its shortage or weakness. Please discuss the unsatisfied results in your project. And discuss the feasible suggestions of future work to revise/improve your result.

6 Conclusion

In this part, you should summarize your project. What important results did you find for your topic and what’s the effect of this result on the real-world?

ACKNOWLEDGMENTS

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REFERENCES

Use the following ACM Reference format for your citation

FirstName Surname, FirstName Surname and FirstName Surname. 2018. Insert Your Title Here: Insert Subtitle Here. In *Proceedings of ACM Woodstock conference (WOODSTOCK’18). ACM, New York, NY, USA, 2 pages.* <https://doi.org/10.1145/1234567890>

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