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Looking into the Importance of Mental Health in Ohio

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Population and Public Health

Scholarship in Medicine Final Report

By checking this box, I indicate that my mentor has read and reviewed my draft proposal prior to submission (I am in the May “super short course”)

Abstract

Objective: This study is meant to analyze the effects of poor mental health as it relates to other health outcomes. *Methods:* Data on mental and physical health will be collected from the County Health Rankings website. Then tests will be performed to compare rates of poor mental health days between Ohio and various other states. Then the number of poor mental health days will be correlated to physical inactivity and premature death rates to see if there is a positive or negative correlation. Lastly, poor mental health days and insufficient sleep will be used to see if those two variables can predict adult obesity rates as a health outcome. *Results:* Ohio was found to have significantly more mentally unhealthy days than other states such as Colorado and California. In Ohio, mentally unhealthy days was also significantly correlated with both premature death and adult obesity.

Key Words: Poor Mental Health, Ohio, Physical Inactivity, Obesity, Premature Death

Introduction/Literature Review

In the past, mental health was often ignored in its contribution to physical and overall health. In recent years, it has been more prominent in the public eye as its importance in overall health is being realized. Poor mental health and depressive symptoms have been increasing in recent years. One study found an increase in depression symptoms from 2011 to 2018 in both male and female adolescents.¹ Another study shows an increase in symptoms and treatments for depression in both adolescents and young adults from 2005 to 2014.² Social media has been talked about for being a cause of the increase in mental health issues like depression. One study found that social media may not actually have an effect on depression, while another showed that most teenagers think of it as a threat to good mental health.^{3,4} Finally, one study shows that social media like Facebook may be detrimental effects on self-esteem and well-being.⁵

The link between mental and physical health is vital to look at as there might be connections that show the impact of both on overall health. There have been many studies that show the association between the two, meaning that we need to continue investing this connection. One study shows that people with poor mental health have lower physical activity, inadequate sleep, and other poor quality of life measures.⁶ Other studies show that people with diabetes have a significantly higher chance of having mental health disorders and those with mental health disorders have a harder time controlling their diabetes.^{7,8} Studies have also shown that weight loss over just 3 months can significantly improve depressive symptoms, showing a link between physical health and mental health.⁹

It is necessary to consider what factors affect mental health and what issues mental health may be contributing to. This study will look at what areas of the United States are affected most by poor mental health in order to help to create a more focus plan on how to combat it. Then, we

also will be able to look more deeply into why different states have different qualities of mental health.

This study will continue to look at the link and mental and physical health to see why it is important to address these issues together. Lastly, we need to look at how mental health is affecting overall health by looking at how it affects the rate of health conditions and early death in recent years. This can show the need for more focus on awareness and treatment in order to create a healthier community overall. This study will be looking at Ohio specifically because of its mix of rural and urban areas. Using data from 2020 will give the most recent view of the current state of mental health in Ohio.

Research Questions

RQ 1: How do other states compare to Ohio in number of poor mental health days?

RQ 2: Is amount of physical inactivity associated with number of poor mental health days in Ohio in 2020?

RQ 3: Can the number of poor mental health days and insufficient sleep predict obesity rates in Ohio in 2020?

RQ 4: Is number of poor mental health days associated with increased premature death in Ohio in 2020?

Methods

Context/Protocol

Statistics were collected from countyhealthrankings.org. The data on poor mental health days is from the Behavioral Risk Factor Surveillance System and the 2020 data will be using data from 2017. It shows the average number of “mentally unhealthy” days reported over the last 30 days for each individual county in each state. The data on physical inactivity is from the United States Diabetes Surveillance System and is the percentage of adults 20 years and older that report no leisure-time physical activity. The 2020 data is from 2016 for this variable. The 2020 data on insufficient sleep is from 2016 and is from the Behavioral Risk Factor Surveillance System. It is the percentage of adults who report having less than seven hours of sleep on average. Obesity rates are the percent of adults (age 20 or over) that reports a BMI greater than or equal to 30 kg/m². This data is from the United States Diabetes Surveillance System and the 2020 information uses data from 2016. Premature death rates are from the National Center for Health Statistics and the 2020 data is from 2016 up to 2018. This variable is the years of potential life lost before age 75 per 100,000 people.

Data Collection

The data on average number of poor mental health days was collected for the following states: Ohio, Colorado, California, Florida, Maine, and Montana. I chose these states as they cover different areas and types of living around the U.S. Then the data on poor mental health days, insufficient sleep, adult obesity, premature death, and physical inactivity were recorded for each county in Ohio 2020. There were no exclusion criteria since all of the data was available.

Data Analysis

RQ 1: I used an ANOVA with posthoc test to test if Ohio has significantly more or less poor mental health days than other states in 2020.

RQ 2: Using the variables of physical inactivity and poor mental health days, I used a Pearson correlation using SPSS statistics software to see the correlation coefficient and determine if the two variables are significantly correlated.

*RQ 3:*Next, I performed a stepwise linear regression with poor mental health days and insufficient sleep as the predictor variables and obesity rates as the outcome variable to test if the predictor variables could accurately predict obesity rates in Ohio.

RQ 4: Finally, I analyzed poor mental health days and premature death in Ohio in 2020, and used a Pearson correlation to find the correlation coefficient to see if the two variables were significantly correlated with each other.

Results

An ANOVA was performed to see the difference in the average number of mentally unhealthy days in Ohio counties compared to six other states which was found to be significantly different ($F_{5,319}=61.692, p < .001$). The post hoc tests showed that Ohio had significantly more mentally unhealthy days than Colorado, California, and Montana all with $p < .001$. Table 1 shows the average number for each state. Ohio did not significantly differ from Florida or Maine.

Table 1: Average Number of Mentally Unhealthy Days in 2020

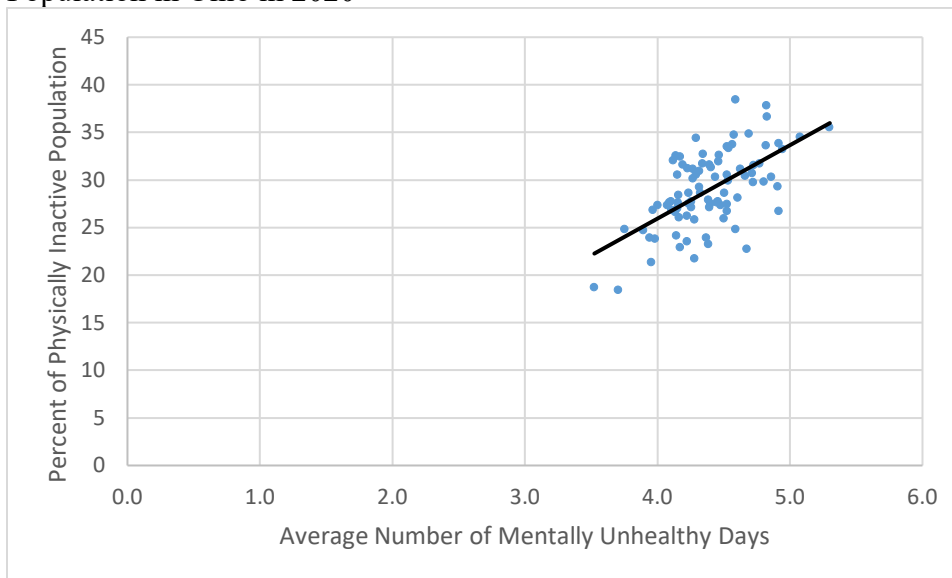
State	n	Mean	SD
Ohio	88	4.39	.314
Colorado	64	3.75 ^a	.303
Florida	67	4.49	.310
California	58	3.95 ^a	.379
Maine	16	4.19	.289
Montana	32	3.69 ^a	.323

Abbreviation: SD, Standard Deviation

^astatistically significantly different from Ohio ($p < .001$)

Next, a Pearson correlation was performed between the average number of mentally unhealthy days and the percent of the population that was physically inactive in Ohio in 2020 (RQ 2). There was found to be a statistically significant positive correlation ($r = .606$, $p < .001$). This shows that as the number of mentally unhealthy days increases in a population, the percent of physically inactive people increases as well (Figure 1).

Figure 1: Correlation between Number of Mentally Unhealthy Days and Physically Inactive Population in Ohio in 2020

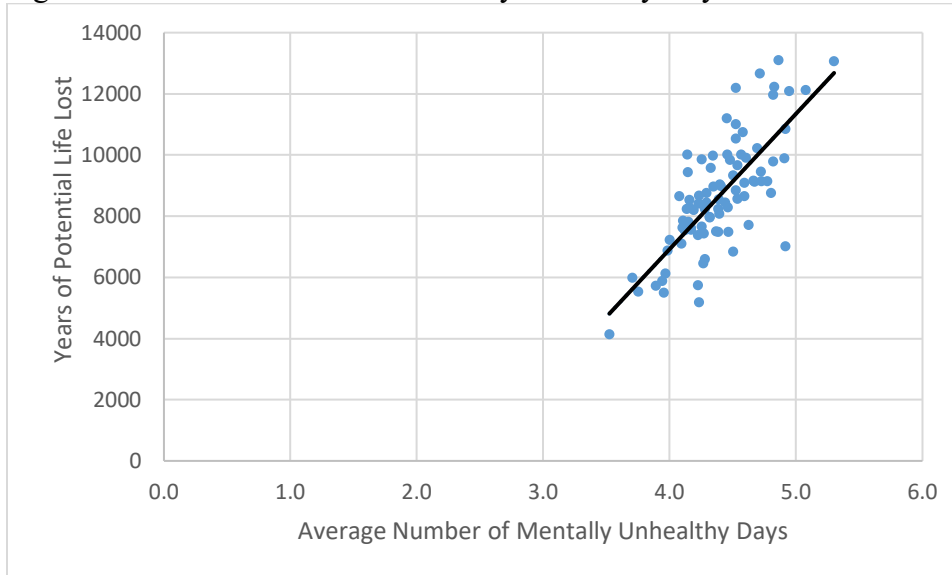


The third research question asked how the number of mentally unhealth days and insufficient sleep can predict rates of adult obesity in Ohio in 2020. The step wise linear regression showed that the best fitting model accounted for 23.4% of the variance in adult obesity and the model was significant ($F_{1,86} = 26.23$, $p < .001$). Insufficient sleep contributed to the model ($B = .850$, $t = 5.122$, $p < .001$), while the number of mentally unhealth days did not significantly contribute.

Finally, the relationship between the average number of mentally unhealthy days and the years of potential life lost was investigated. A statistically significant correlation was found and

was strongly positive ($r = .755$, $p < .001$). This shows a strong relationship between these two variables (Figure 2).

Figure 2: Correlation between Mentally Unhealthy Days and Potential Life Lost in Ohio in 2020



Discussion

Ohio's mental health was compared to various states around the U.S. and was found to have significantly worse mental health than many other states. This shows why it is so important to focus on mental health in Ohio, even though Ohio did not have worse mental health than Maine and Florida. It was also found that mental health was significantly correlated with premature death and physical inactivity.

We know that mental health has been increasing in recent years.¹ This study shows how mental health affects states differently. Mental health is changing differently for each state so addressing the and reasons for them can help effectively treat and prevent issues with mental health in each state. Other studies have also shown the association between mental health and comorbidities such as obesity.⁷ This studies looked at mental health and two more important indicators of health. This study showed that mental health is significantly related to inactivity,

which does make sense as it is harder to exercise during mentally unhealthy days. Mentally unhealthy days were even more strongly correlated to premature death. This study further emphasizes the link of mental and physical health.

This study demonstrates why we need to focus on mental health and public health projects to address the problem. Mental health is important to a long and healthier life. Specifically, it is important to focus on Ohio as there are a high number of mentally unhealthy days for citizens of Ohio. This is an issue that each person can address for themselves and focus on how they can make their own health better. We can also put systems and programs in place to prevent the trend of poor mental health to create a healthier community.

Conclusion

This study was meant to look at the state of mental health in 2020, but most of the data from County Health Rankings is from previous years. A future research project can more accurately look at 2020 once more data is released. This study also focused on Ohio, but it is important to look at why Ohio has more mentally unhealthy days than other states. Addressing the differences such as location, climate, and physical activity might be important factors to investigate next.

Mental health has been getting more attention lately as we see the importance of overall health. It has been a stigmatized part of health care in the public though. Showing the link between mental and physical health can show the public why it is vital to protect and strengthen them both. It is the job of public health officials, doctors, mental health workers and each individual to focus on how to better our own mental health and how to create policies and opportunities to better the mental health of the community.

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