DATA MANIPULATION

For pre-COVID analysis, datasets were obtained from RANDS. Internet usage values were converted so that units were all the same metric. This was necessary as some responses measured internet usage daily, while others weekly. Without taking this step, results would be skewed and misleading. Notably, the change in the surveying company after round 2 of RANDS resulted in a lack of information on internet usage, which posed a challenge to compare pre-COVID and during COVID values. This is why data from Pew Research Center was used instead of RANDS data for this time.

For COVID-19 data, datasets from Pew Research Center were used. It is important to note that for internet usage times, responses were qualitative instead of quantitative. The qualitative responses for internet usage made it infeasible to run a normal regression model. Therefore, this study opted for a logistic regression model that created a binary subset for each of the four answer choices a respondent could choose from. This method allowed the analysis of the qualitative responses effectively.

Between pre-COVID and COVID data, a problem of different variable lengths occurred while running logistic regressions. This emerged due to using different datasets to run regressions. Mental health data came RANDS while internet usage data came from PRC. To address this matter, the length of internet usage data was reduced to match the length of mental health variables. Despite the option of forecasting future mental health values, it was not pursued due to time constraints.

RESULTS

In this study, an investigation was conducted to examine the impact of internet usage on individuals' mental health. The study employed data from two pre-COVID surveys, namely RANDS1 and RANDS2, as well as two COVID-related surveys, RANDS.COVID1 and RANDS.COVID2, along with supplementary datasets, ATP and ATP2. The aim was to determine the relationship between internet usage and various measures of anxiety, depression, physical activity, and related factors.

The present study utilized regression analysis to examine the association between internet usage and several outcome measures of health. The results showed a negative association between internet usage and ANX_1, a measure of anxiety, where a 1% increase in internet usage led to a 1.960% decrease in ANX_1, reaching statistical significance at the 99.9% level. This finding suggests that there is a strong relationship between internet usage and anxiety given a high significance level. Moreover, internet usage was negatively associated with ACIEFFRT and ACINERV, measures of lethargy and nervousness, respectively. Specifically, a 1% increase in internet usage led to a 9.988% decrease in ACIEFFRT and a 1.780% decrease in ACINERV. However, it is noteworthy that these associations were only significant at the 90% level, indicating the need for caution when interpreting these results in future research. Additionally, the results revealed a negative association between internet usage and VIGNO_N, a measure of vigorous physical activity, where a 1% increase in internet usage led to a 4.662% decrease in VIGNO_N, reaching statistical significance at the 95% level. Additional results can be seen in Table 1. Taken together, these findings suggest that internet usage may have negative impacts on both mental and physical health.

It is interesting to note that there were some positive relationships between internet usage and other health variables. There was a positive association with STRNGO_N, a measure of strength-training exercises, and ACISAD, a measure of how often a participant felt so sad that

nothing could cheer them up. As internet usage increased by 1%, these variables increased by 3.332% and 1.780% respectively. STRNGO_N reached a statistical significance at the 99.99% level, and ACISAD reached a statistically significant level at 95%. Further investigation is required to fully comprehend these complex findings.

The RANDS2 data yielded similar findings, indicating that internet usage had a negative impact on ANX_3 and ACINERV, measures of anxiety and nervousness, respectively. However, a positive relationship was observed between internet usage and MODNO_N, a measure of light or moderate physical activity. Additional results can be seen in Table 2. The results from both the RANDS1 and RANDS2 datasets suggest a consistent negative association between internet usage and anxiety measures, while also highlighting the potential positive relationship between internet usage and certain physical activity measures and depression levels.

In contrast, the analysis of the COVID-related surveys, RANDS.COVID1 and RANDS.COVID2, did not yield many significant findings when considering any of the subsets. Using RANDS.COVID1 data with ATP data, there was a negative relationship between almost always using internet and depression levels, DEPLFREQ. As internet usage increases by 1%, depression levels increased by 3.623% at a 95% significance level. Additional results can be seen in Table 3. There were no significant findings using RANDS.COVID2 data with ATP data. This was a disappointment in the world of research, but it highlights the importance of research needed to understand that although internet usage is increasing in the United States, it is not having as significant impacts on mental health as we originally thought.

An examination of the results from RANDS.COVID1 and ATP2 revealed a modest relationship between using the internet several times a week and DEPLEVEL3, with individuals feeling somewhere in between a little and a lot depressed (beta = -0.015%). This reached a statistical significance level of 95%. Additional results can be seen in Table 4. It is important to note that there

were no significant findings using RANDS.COVID2 data and ATP2 data. These results were perceived as perplexing as the same variables were used in RANDS.COVID1 and ATP2.

Overall, the results of this study suggest that the impact of internet usage on individuals' well-being may vary depending on the context in which it is considered. These findings may have implications for public health interventions aimed at promoting physical activity and mitigating the negative effects of internet usage on mental health. Further research in this area may shed more light on the underlying mechanisms that drive the observed associations.

TABLES

Table 1

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Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.528e+01  2.880e+00  12.250  < 2e-16 ***
ANX_1       -1.960e+00  5.305e-01  -3.695 0.000225 ***
ANX_3        5.302e-01  5.291e-01   1.002 0.316474
MODNO_N      1.131e-05  8.236e-05   0.137 0.890782
STRNGNO_N    3.332e-01  3.615e-02   9.216  < 2e-16 ***
VIGNO_N     -4.622e-03  2.292e-03  -2.016 0.043896 *
ALC12MNO_N  -2.090e-03  1.884e-03  -1.109 0.267463
ACIWTHLS     8.326e-02  7.035e-01   0.118 0.905802
ACISAD       1.780e+00  7.340e-01   2.425 0.015405 *
ACIRSTLS    -4.630e-01  5.627e-01  -0.823 0.410660
ACINERV     -1.178e+00  6.606e-01  -1.783 0.074707 .
ACIHOPLS    -5.223e-01  5.874e-01  -0.889 0.374088
ACIEFFRT    -9.998e-01  5.496e-01  -1.819 0.069021 .
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1
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Table 2

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Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 29.2870927  2.6773904  10.939  < 2e-16 ***
ANX_1        0.4696533  0.5413064   0.868 0.385682
ANX_3        1.8415023  0.4760714   3.868 0.000113 ***
MODNO_N      0.0005214  0.0001731   3.012 0.002618 **
STRNGNO_N   -0.0644869  0.0508545  -1.268 0.204894
VIGNO_N     -0.0021312  0.0020529  -1.038 0.299315
ALC12MNO_N  -0.0004015  0.0016923  -0.237 0.812490
ACIWTHLS    -1.1101992  0.7388765  -1.503 0.133083
ACISAD       1.0290896  0.7123802   1.445 0.148703
ACIRSTLS    -0.2188520  0.5659866  -0.387 0.699031
ACINERV     -1.6378313  0.6651569  -2.462 0.013872 *
ACIHOPLS     0.8080881  0.7648713   1.057 0.290842
ACIEFFRT    -0.9773202  0.5740667  -1.702 0.088797 .
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1
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Table 3

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                        Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.723e-01  2.382e-02  19.830   <2e-16 ***
RANDS.COVID1$ANXFREQ   -1.081e-03  1.347e-03  -0.803   0.4220
RANDS.COVID1$ANXLEVEL 1  1.619e-03  2.441e-02   0.066   0.9471
RANDS.COVID1$ANXLEVEL 2  2.661e-02  3.156e-02   0.843   0.3991
RANDS.COVID1$ANXLEVEL 3 -2.116e-05  2.689e-02  -0.001   0.9994
RANDS.COVID1$ANXLEVEL77 -2.863e-02  2.373e-01  -0.121   0.9040
RANDS.COVID1$ANXLEVEL98 -1.075e-01  2.419e-01  -0.445   0.6566
RANDS.COVID1$DEPFREQ    -3.623e-03  1.696e-03  -2.136   0.0327 *
RANDS.COVID1$DEPLEVEL 1 -8.634e-03  1.636e-02  -0.528   0.5977
RANDS.COVID1$DEPLEVEL 2 -2.148e-02  2.609e-02  -0.823   0.4105
RANDS.COVID1$DEPLEVEL 3 -2.486e-02  2.115e-02  -1.175   0.2398
RANDS.COVID1$DEPLEVEL77  1.060e-01  3.717e-01   0.285   0.7756
RANDS.COVID1$DEPLEVEL98  2.526e-01  1.500e-01   1.684   0.0922 .
RANDS.COVID1$SRHPSYCH   -3.251e-03  2.704e-03  -1.202   0.2293
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
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