Impact of Covid 19 on Health of Women of Childbearing age

Olga Ulyankina-Mughal, Matthew Kuofie

Grand Canyon University, USA

OUlyankina@my.gcu.edu, calmedbancorp@yahoo.com, matthew.kuofie@my.gcu.edu, mhkuofie@msn.com

Abstract

The corona virus disease 2019 (COVID-19) global pandemic period has drastically affected everyone worldwide. The global pandemic is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Covid 19 has changed people's lifestyles. However, the lifestyles that people implemented would remain the same for a long-time affecting people's health. Therefore, this research focused on women of childbearing age and worked or studied from home. The result found that the BMI of women who are mothers (women of childbearing age) got lower BMI with more hours of sleep. The study found that a majority of them were married, and a majority had higher education.

Keywords: Body mass index, Covid-19, health, women of childbearing age, lifestyles of people

Introduction

The corona virus disease 2019 (COVID-19) global pandemic period has drastically affected everyone worldwide. The global pandemic is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The World Health Organization

(WHO) declared COVID-19 as global pandemic on 12 March 2020 (World Health Organization, 2020). There were 10,694,288 confirmed cases, 516,905 deaths and 5,480,394 recoveries globally as of July 2, 2020.

Covid-19 has changed people's lifestyles. However, the lifestyles that people implemented would remain the same for a long-time affecting people's health. Kuofie and Muhammad (2021) stated that artificial intelligence/information technology, education, healthcare industries would maintain the same practices into post COVID-19. Plakun (2020) stated that due to COVID-19, psychotherapists would be treating patients with moral injury during and after the COVID-19 era. However, little research has been done on the impact of covid-19 on women of childbearing age and worked or studied from home. Therefore, this research focused on women of childbearing age and worked or studied from home.

We concluded the factors contributing to unhealthy BMI among the ones surveyed, and we found out the sedentary lifestyle that increased during Covid (Zheng et al., 2020) influenced the unhealthy BMI if present (Pulsford, 2012).

Data Collection

Thirty-seven women who were mothers completed the survey. We used SurveyMonkey to collect data. The survey to determine the effects of various lifestyle factors on health in women of childbearing age with children. Among our qualitative questions, we included the factor of working from home or studying online, since there is a possibility that prolonged sitting could contribute to higher body mass index (BMI) (Pulsford, 2012). We collected the marital status, the level of education, and the working from home or online schooling factors.

Data Analysis

The study used multiple regression to find how independent quantitative variables like physical activity, sleep, hydration contribute or affect the dependable variable of BMI, where BMI represents good health.

To find BMI, we included the questions of height and weight, which fall under ratio data and thus add up to quantitative questions (Lind et al., 2018). The BMI was calculated by dividing weight in pounds (lb) by height in inches (in) squared, then the result multiplied by 703, which is a conversion factor (CDC, n.d.). According to the Centers for Disease Control and Prevention, the healthy BMI is between 18.5-24.9. Therefore, BMI between 25-29.9 indicates "overweight," 30.0 and above is "obese", and less than 18.5 is "underweight" (CDC, n.d.). We built a histogram to determine if our sample data is evenly spread or there is a tendency towards the specific result.

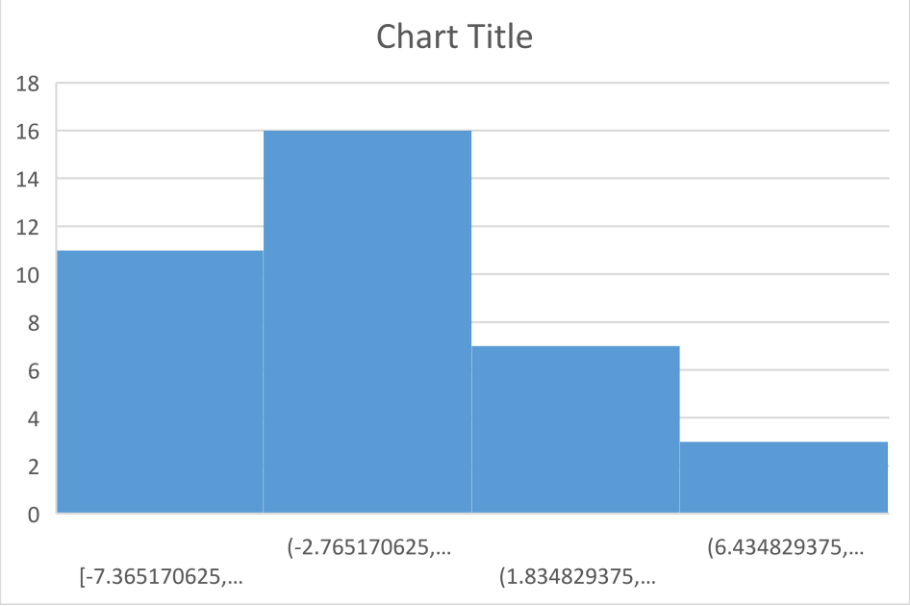

Figure 1: Histogram of Frequency of women vs residual BMI

Figure 1 shows that 16 women had residual BMI between -2.765 and 1.834.

We used a sample of 37 women of childbearing age and performed a multiple regression analysis using the collected data to find out what factors have a significant relationship with BMI. We used a *backward elimination method* which begins with the entire set of variables and eliminates one independent variable each time we run the multiple regression test (Lind et al., 2018). First, we created a correlation matrix and defined that 1.0 is a perfect correlation. Next, we checked for multicollinearity which is when independent variables have a strong correlation with other independent variables. We did not find any significant multicollinearity. Then, we ran a multiple regression analysis on all the independent variables, eliminated the one with the highest P-value, and repeated until there were no independent variables with a p-value above the chosen significance level of .05.

As a result of the multiple regression testing, we defined that hours of sleep and marital status had the strongest effect on the BMI out of the values we selected for testing, so next, we conducted a hypothesis test in the form of a single-factor ANOVA test based on the data of hours of sleep and working from home/studying online to see if there is a direct correlation between being able to work or study from home and the amount of sleep. Our null hypothesis is that there is no difference in hours of sleep between working from home/studying online mothers and non-working from home ones. Alternative hypothesis is that there is a difference. We set the significance value at 0.05. The test statistic F is less than the critical F value. The P-value is higher than the significance value of 0.05. Thus, we do not have evidence to reject the null hypothesis. So, we cannot state that there is a difference in the number of hours of sleep among those who work/study from home and those who do not.

We conducted a survey to determine the effects of various lifestyle factors on health in women of childbearing age with children. The independent variable of BMI was chosen, which

was gathered by asking height and weight, and then calculated. We found that a majority of them were married, and a majority had higher education.

We took the survey data and conducted an analysis on two of the variables. For each variable, we found the mean, median, mode, variance, standard deviation, and probability of an event occurring. The mean value is the average value for the data. The median is the middle value of the data ordered by value. The mode is the most common value. The variance is a measure of how different the data points are from the mean, and the standard deviation, which is the square root of the variance, is a measure of the average distance between the measured data points and the mean (Lind et al., 2018). We chose to analyze the amount of sleep and the amount of exercise. For sleep, we found that the mean is 6.03 hours, the median 5 hours, the mode 5 hours, the variance 1.25, and the standard deviation 1.12 hours.

We calculated the probability of sleeping up to 8 hours to be 0.735. A majority of women surveyed get less than 8 hours of sleep. Increased sleep factor offset the sedentary lifestyle as empirical data shows that lack of sleep increases BMI in age groups below 49 (Grandner, n.d.). Since our surveyed women are all childbearing age, the majority is below 49 and fall under that group.

For the amount of exercise, we found the mean to be 23.1 minutes, the median to be 15 minutes, the mode to be 15 minutes, the variance to be 232.43, and the standard deviation to be 15.25 minutes. We calculated the probability of exercising less than 30 minutes to be 0.727. Thirty minutes of exercise per day is recommended, so most of the women surveyed do not get as much exercise as would be optimal. More than 3/4ths of the surveyed women did not exercise for more than 15 minutes, and only one person exercised for more than 30 minutes.

We found that the majority of women drank 2L or less per day. We graphed height and weight and found that height appeared to be normally distributed, but the weight representation was positively skewed.

We then created confidence intervals for the means of data from the survey. The confidence interval is the range into which we can expect the population mean to fall within a given confidence level (Lind et al., 2018). BMI was chosen as an example of interval level data, and height was chosen as an example of ratio data. Interval data, BMI, and height as a ratio data were investigated at 90%, 95%, and 98% confidence levels. The mean height was found at 64.486", with a margin of error at 90% confidence of 0.786, for a confidence interval of 63.699 to 65.273. At a 95% confidence level, for example, we can expect the population mean to fall into the confidence interval 95% of the time. At 95%, the interval is 63.541 to 65.432. At 98%, it is 63.352 to 65.621. The national average height for all women is approximately 64 inches (CDC, 2018), which is within the confidence interval that we calculated at all tested levels of significance. The population of women with children may be slightly taller than the national average of all women, based on our findings.

The mean BMI was found to be 26.136. The margin of error at 90% confidence was found to be 1.330, for a confidence interval of 24.81 to 27.47. The confidence interval at 95% was found to be 24.54 to 27.73. The confidence interval at 98% was 24.22 to 28.05. The national average BMI for all women is 29.5 (CDC, 2018), which is outside the confidence intervals at all tested levels of significance. Based on our findings, the population of women with children may have a much lower BMI than the national average for all women.

Our analysis confirmed the empirical data of Grandner et al. (2015, November) that lack of sleep increased BMI (Grandner et al., 2015). However, we narrowed our research to a specific

group, and in our analysis, the BMI of women who are mothers (women of childbearing age) got lower BMI with more hours of sleep. The unexpected factor of marriage had an effect on BMI in combination with the sleep factor and the unmarried women who slept 4-6 hours a day tended to have healthier BMI than the married ones who slept the same amount of time. Unexpectedly, exercise was eliminated as a factor, which may be because more than 3/4ths of respondents reported the lowest level of exercise. In total, the regression did not show a strong relationship between the values, with an R2 value of .178, and further research is recommended.

Conclusion and Recommendations

The corona virus disease 2019 (COVID-19) global pandemic period has drastically affected everyone worldwide. Covid 19 has changed people's lifestyles. However, the lifestyles that people implemented would remain the same for a long-time affecting people's health. This research focused on women of childbearing age and worked or studied from home.

We conducted a survey to determine the effects of various lifestyle factors on health in women of childbearing age with children. The factor of working or studying from home was included in determining the effects of people's lifestyles. Thirty-seven women who are mothers completed the survey. However, we narrowed our research to a specific group, and in our analysis, the BMI of women who are mothers (women of childbearing age) got lower BMI with more hours of sleep. The unexpected factor of marriage had an effect on BMI in combination with the sleep factor and the unmarried women who slept 4-6 hours a day tended to have healthier BMI than the married ones who slept the same amount of time. Unexpectedly, exercise was eliminated as a factor, which may be because more than 3/4ths of respondents reported the lowest level of exercise. In total, our regression has not shown a strong relationship between the

values, with an R2 value of .178, and further research is recommended. The study found that a majority of them were married, and a majority had higher education.

References

CDC. (2018). *National health statistics reports.* https://www.cdc.gov/nchs/data/nhsr/nhsr122-508.pdf

CDC. (n.d.). *Calculating BMI using the English system. CDC.gov.* https://www.cdc.gov/nccdphp/dnpao/growthcharts/training/bmiage/page5_2.html

CDC. (n.d.). *About adult BMI*. CDC.gov. https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

Grandner, M., Schopfer, E., Malhorta, A. (2015, November). The relationship between sleep duration and body mass index depends on age. *Obesity (Silver Spring), 23*(12), 2491-2498. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4700549.

Kuofie, M., Muhammad, N. M. N., (2021). Leaders Perspective on Post COVID-19 Pandemic period: Global Business focus. *International Journal of Health and Economic Development, 7(1), 13-36, January 2021*

Lind, D. A., Marchal, W. G., & Wathen, S. A. (2018). *Statistical techniques in business and economics* (17th ed.). New York, NY: McGraw Hill Education, ISBN-13: 9781259666360

Plakun, E. M. (2020, June 2). Psychotherapy in the Post-COVID-19 Era. *Journal of Psychiatric Practice*, 0(0), 1-4. https://doi: 10.1097/PRA.0000000000000476

Pulsford, R., Stamatakis, E., Hillsdon, M. (2012). Sitting behavior and obesity. *American Journal of Preventive Medicine, 44*(2), 132-138. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3550520

World Health Organization. (2020). *Coronavirus (COVID-19) Events as They Happen.* World Health Organization. Retrieved June 30, 2022, from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen.

Zheng, C., Yajun Huang, W., Sheridan, S., Hui-Ping Sit, C., Chen, X.-K., Heung-Sang Wong, S. (2020, August). COVID-19 Pandemic brings a sedentary lifestyle in young adults: A cross-sectional and longitudinal study. *International Journal of Environmental Research and Public Health, 17*(17). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7503726