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UROP Proposal

Statistical Analysis of Reported Health Habits and Mental Health from the Bridge to Health Survey 2015: Northeastern Minnesota and Northwestern Wisconsin

Background

Over the past two decades, the prevalence of major depressive disorder has hovered around 4.4 percent (Baxter et al.). The lack of decline stimulates the question of what preventative measures may exist. One popular solution of interest is the effects of physical exercise on mental health. Many controlled trials suggest that exercise stimulates antidepressive effects as long as performed routinely at light to moderate rates (Hamer, Coombs, and Stamatakis). In an effort to prove a bidirectional association, statisticians also analyzed sedentary behaviors in comparison to mental disorders as found by the Health Survey for England. The results did, in fact, show an association between sedentary time and adverse mental health suggesting that adults who participate in less physical activity are more likely to experience depressive episodes or low mood. However, this did not coincide with findings of the National Health and Nutrition Examination Survey done previously (Hamer, Coombs, and Stamatakis). Although the English survey presents evidence of exercise as a preventative measure for mental disorders, the discrepancies make further studies necessary to determine the actual effectiveness.

Diet's role on mental health presents a more recent area of interest. A 2015 analysis on the Personality and Total Health (PATH) Through Life Study, a community survey completed in Australia, evaluated the link between women's food consumption and mental health. The results suggest those who consume a "traditional" diet of vegetables, fruit, meat, fish, and whole grains have approximately 35 percent less risk of depression than "western diet" adherers who

frequently consume fatty, processed food like pizza, chips, burgers, and alcohol (Jacka et al.). Though analyses on both this survey and the Health Survey for England found associations between the topics of interest, survey statistics cannot imply causation. They can, however, stimulate cause for further investigation into the use of diet or exercise as a preventative measure for depression and other symptoms of poor mental health.

Objectives

I intend to perform further analysis on the potential mental health inhibitors mentioned above using results from the 2015 Bridge to Health Survey completed in northeastern Minnesota and Douglas County, Wisconsin. The survey consisted of 70 questions regarding current health conditions, lifestyle factors, access to health and dental care, and health insurance. The purpose was to gather data to endorse and highlight need for various community wellness projects. In hopes that I can support the survey's purpose, I plan to focus my analysis on diet and exercise in comparison to reports of poor mental health. Significant results could benefit the community by raising awareness of mental health and encouraging education on the impacts of diet and exercise. On a broader scope, my analysis will further the research of the survey analyses referenced above.

Personally, I hope to test my statistical coursework in regression analysis, biostatistics, and SAS on this real life application in addition to learning new analysis techniques. This project combines my enthusiasm for public health with my interests in data analysis making it a suitable UROP project.

Methods

Upon proposal submission, I will gain permission to access the 2015 Bridge to Health Survey results through my advisor, Xuan Li who already possesses the data. Names and other identifying information will remain undisclosed. The next step is uploading the data into SAS, Statistical Analysis System, and reading in the variables of interest. Specifically, answers to questions regarding mental health (number of days of poor mentality and diagnosis of a mental illness), diet (servings of vegetables, fruit, and fruit juice consumed, locally grown food purchases, and meals eaten out), and exercise (average days per week of moderate or vigorous activity) (Peterson). Potential confounding variables include age, sex, income, race, employment status, alcohol consumption, smoking status, and long-standing illnesses. Although survey answers have already been quantified, further categorization of variables such as age and alcohol consumption may be helpful. Also, the addition of answers reporting servings of vegetables, fruit, and juices, and local produce purchases with the subtraction of reports of eating out acts to simplify the definition of a healthy diet by creating an overall nutrition score where higher numbers indicate healthier.

Once the data is prepared, I will use multiple logistic regression to quantify associations of diet and exercise with diagnosis of a mental illness. Odds ratios and 95% confidence intervals will be constructed while adjusting for any previously mentioned confounding variables. Also, a test for association between diet and exercise and the reported number of poor mental health days will be computed. Possible tests for this include multiple linear regression or Poisson distribution, but the exact method cannot be determined until data retrieval. To conclude my UROP experience, I intend to present my research at a statistics conference and, if significant results are found, to the Duluth community in order to raise awareness of links between health habits and exercise.

Works Cited

Baxter et al. "Challenging the Myth of an 'Epidemic' of Common Mental Disorders: Trends in the Global Prevalence of Anxiety and Depression between 1990 and 2010." *Depression and Anxiety*, vol. 31, no. 6, June 2014, pp. 506-516. *Wiley Online Library*, DOI: 10.1002/da.22130.

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Jacka et al. "Association of Western and Traditional Diets with Depression and Anxiety in Women." *The American Journal of Psychiatry*, vol. 167, no. 3, 1 Mar. 2010, pp. 305-311, http://dx.doi.org/10.1176/appi.ajp.2009.09060881. Accessed 20 Sep. 2016.

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