Predictors of Poor Mental Health

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Abstract

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Keywords: Mental Health, Alcohol Abuse, Drug Usage, Canadian Health, Logistic Regression;

Introduction

Mental Health is a term that describes an individual's emotional and psychological condition. Over the years, the prevalence of mental health problems has grown exponentially and as a result, led to greater focus on it's research. According to Smetanin et al., 1 in 5 Canadians experience either a mental health or addiction issue in a given year (Smetanin, 2011). Furthermore, by the age of forty, 50% of individuals in Canada have had a mental health illness (Smetanin, 2011). With this upward trend, it will be important to conduct further research, improve current resources and educate individuals on the mental health risks.

Despite greater awareness, acceptance and access to services, there remains a stigma amongst the Canadian population. In a 2015 survey, researchers found that 39% of Ontarians would not tell their employers if they had a mental health issue (Canadian Medical Association, 2008). In addition, a 2016 survey found that 40% of respondents never sought medical help for depressive and anxiety pervaded feelings (Book, 2016). The underreporting of mental health problems is a concern as the fear of being socially stigmatized leads to an under-utilization of medical resources and further perpetuation of the present stigma.

In this study, I am interested in exploring the relationship between an individual's mental health and other key variables. In addition to perceived mental health, I have also selected the following variables of interest from the Canadian Community Health Survey (CCHS): Age, Sex, Perceived Mental Health, Perceived Weight, Stress Levels, Drug Use and Weekly Physical Activity. The CCHS used in this study was conducted for the time period of 2017-2018. The objective of the survey was to gather health related information from all provinces and territories in Canada. The survey was conducted by 113, 291 respondents over the age of 12 and includes X variables. In order to conduct this analysis, I utilized a logistic regression model with perceived mental health as the binary dependent variable.

This report includes 4 sections, excluding the introduction. First, in the data section, I provide an overview of the CCHS 2017-2018 survey and dataset. Plots of key variables are included in this section to gain a better understanding of the respondent population. Second, in the model section, I discuss the logistic regression model used in this study and it's methodology. Thirdly, in the results section, I provide the statistical values determined through the analysis. Finally, in the discussion section, I further explore the results of my research and present weaknesses of this report. This report is conducted using R (R Core Team [2019]). Tidyverse (Wickham, 2019) was the most utilized library in this study. The report was compiled using R markdown (Allaire, 2020).

Data

The Canadian Community Health Survey (CCHS) is a cross-sectional survey that collected responses from individuals aged 12 and over in 100 different regions across every province and territory in Canada (CCHS User Guide). A cross-sectional survey is an observational study design where the researchers measure the outcome and exposures in the study respondents simultaneously (Setia, 2016). Compared to cohort studies, it is a faster and cheaper method of study that is commonly used public health research (Setia, 2016).

The CCHS data used in this study did not include individuals from Indian reserves, Crown Lands, remote regions, prisons, religious institutions and residents aged 12 to 17 living in foster homes within the survey sampling frame (CCHS User Guide). However, approximately 98% of Canadians aged 12 and over were covered by the CCHS (CCHS User Guide). Data was collected using computer-assisted interviewing through a combination of telephone interviews and personal interview (CCHS User Guide). The target population in this study is the general Canadian population. The sampling frame is Canadians over the age of 12 from each of the provinces and territories. The sample population is the 113, 291 individuals that completed the survey.

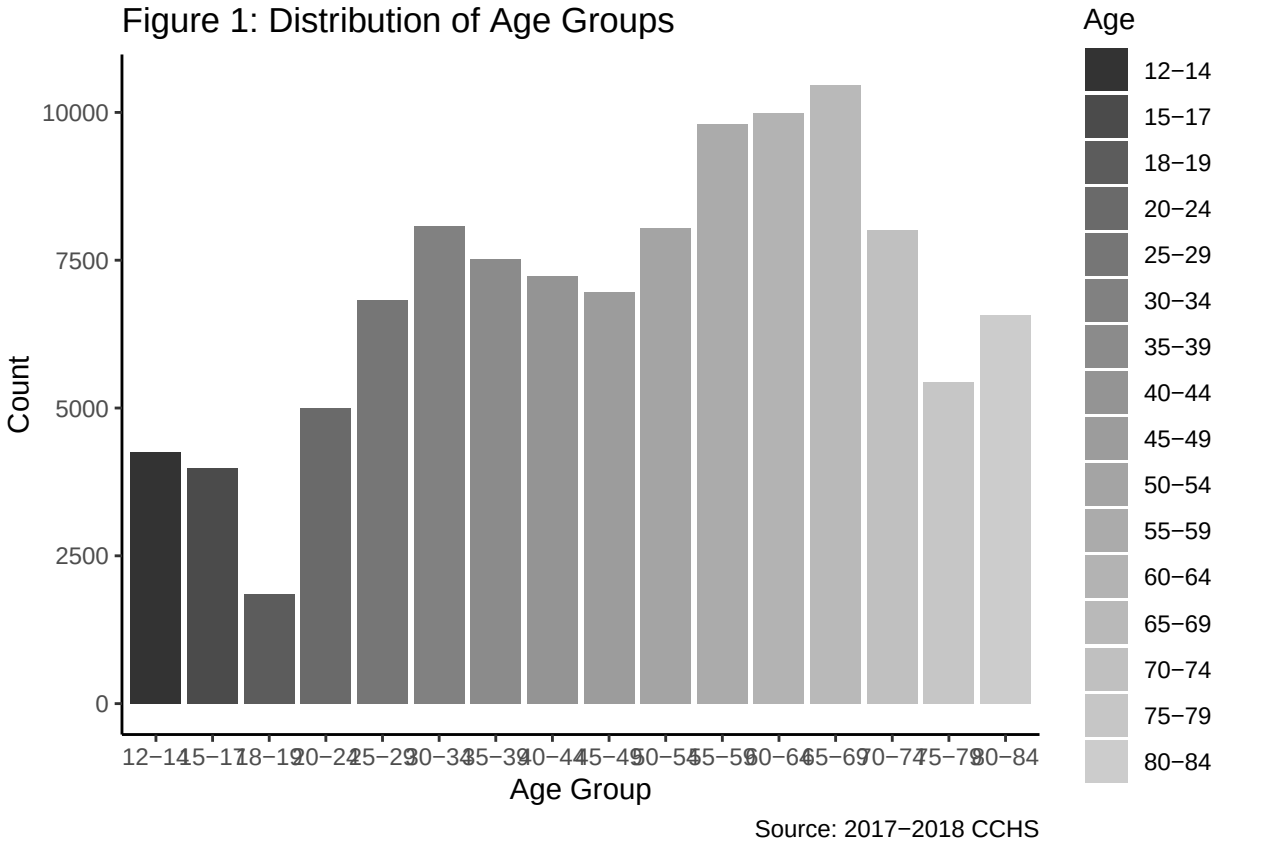
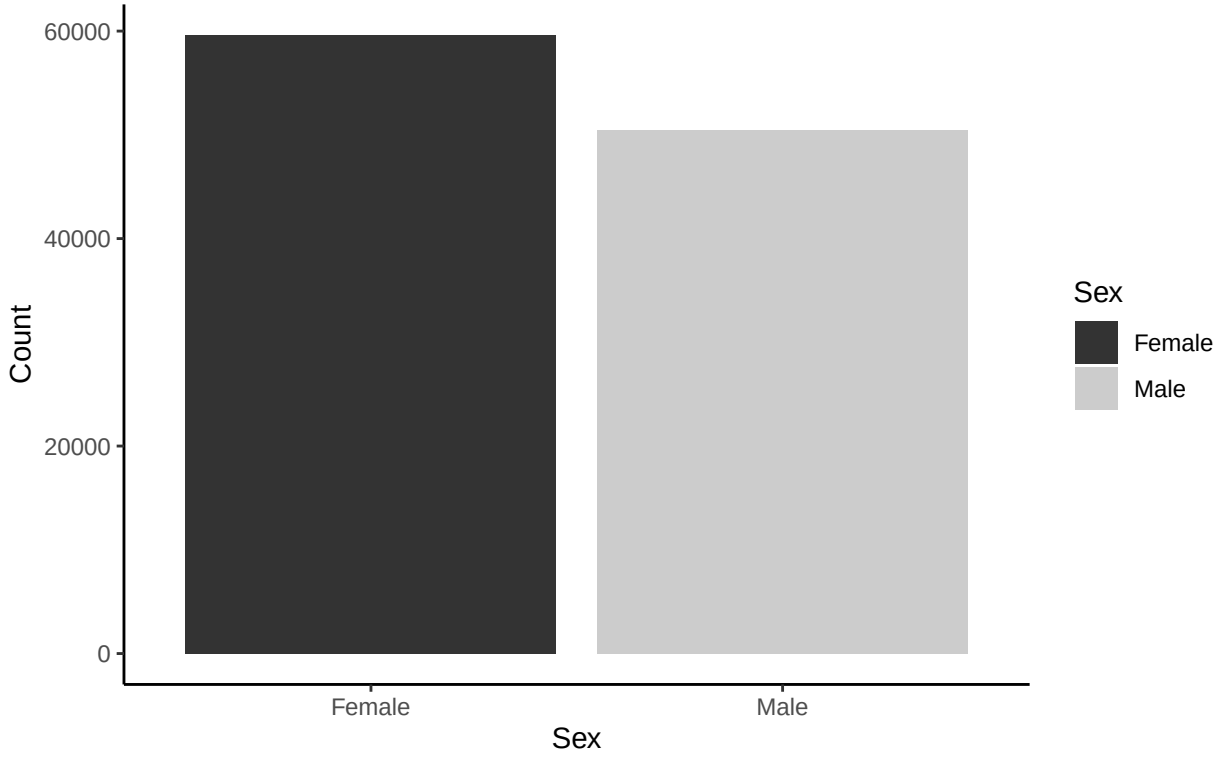
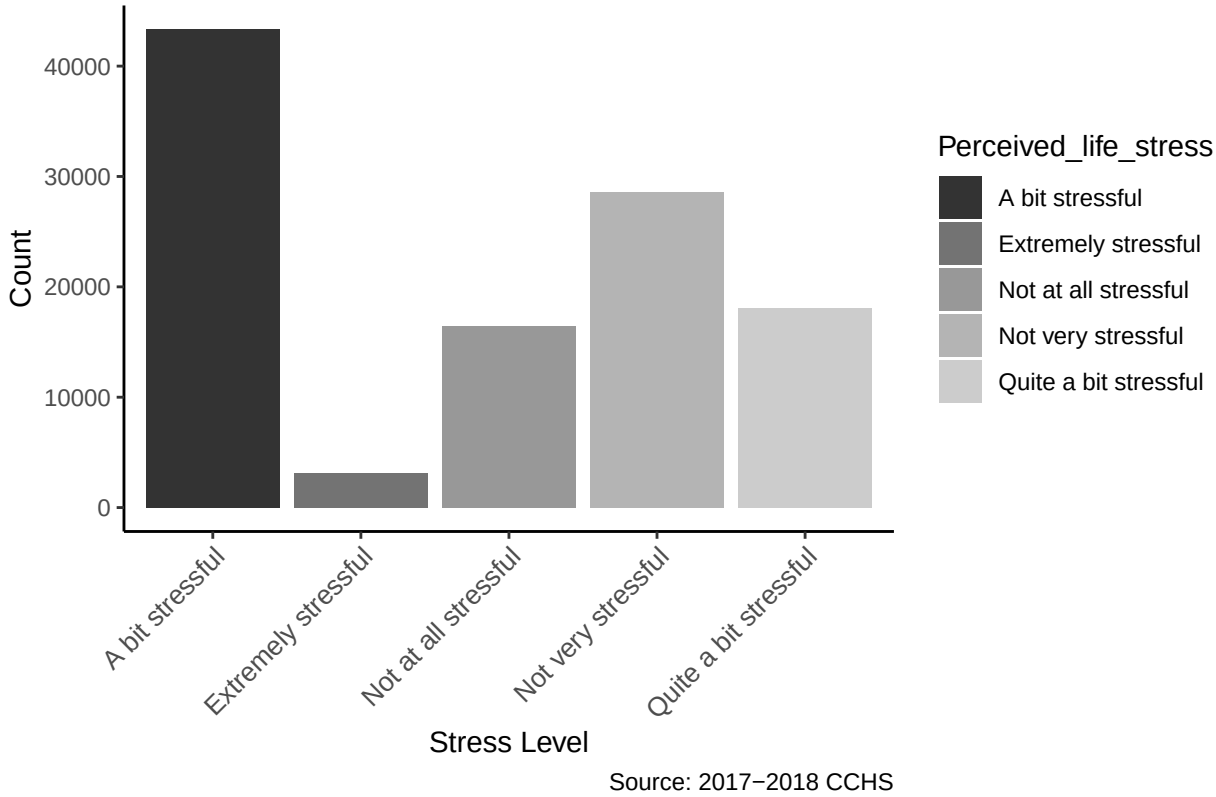


Figure 2: Distribution of Sex



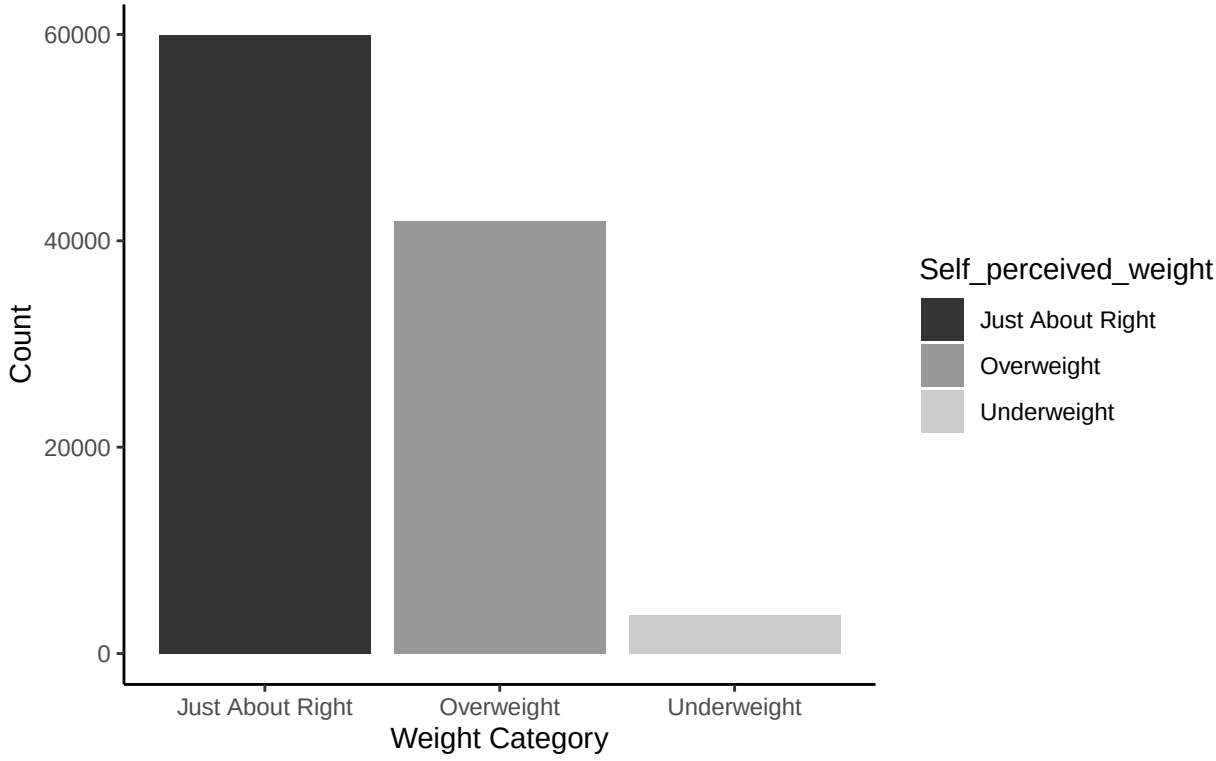
Source: 2017−2018 CCHS

Figure 3: Perceived Life Stress



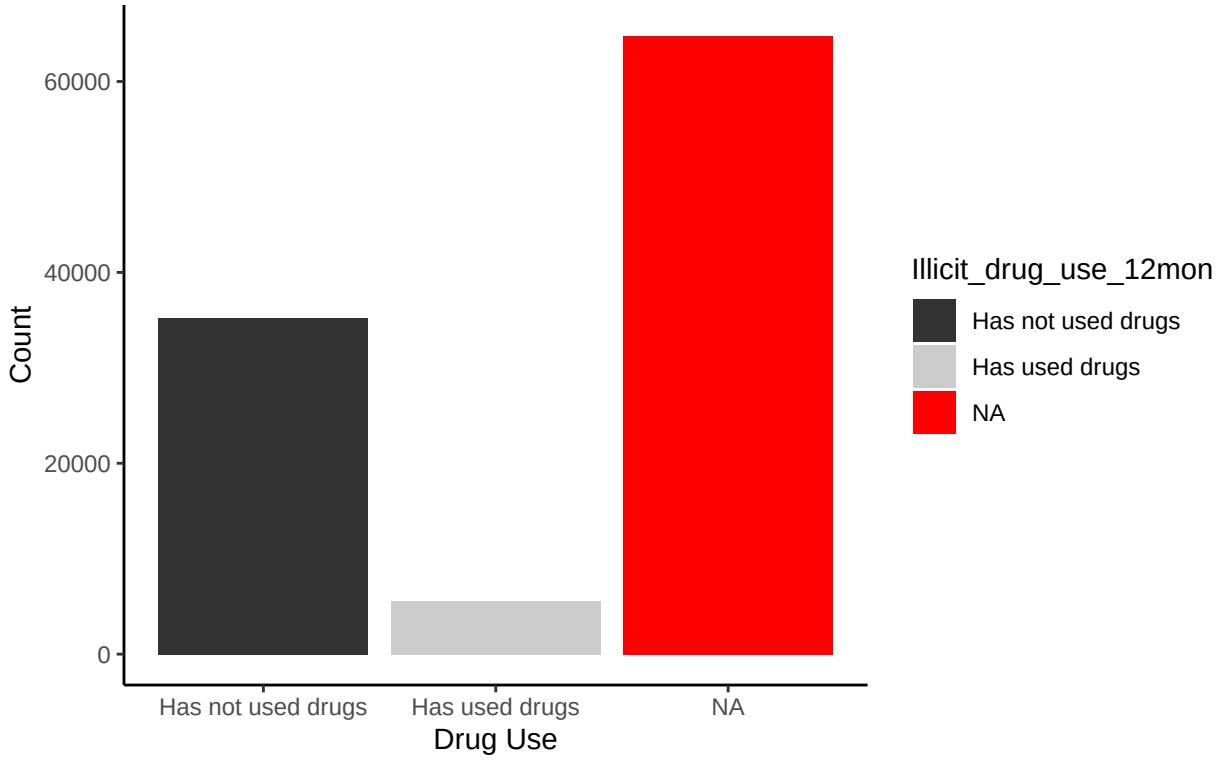
Source: 2017−2018 CCHS

Figure 4: Self Perceived Weight



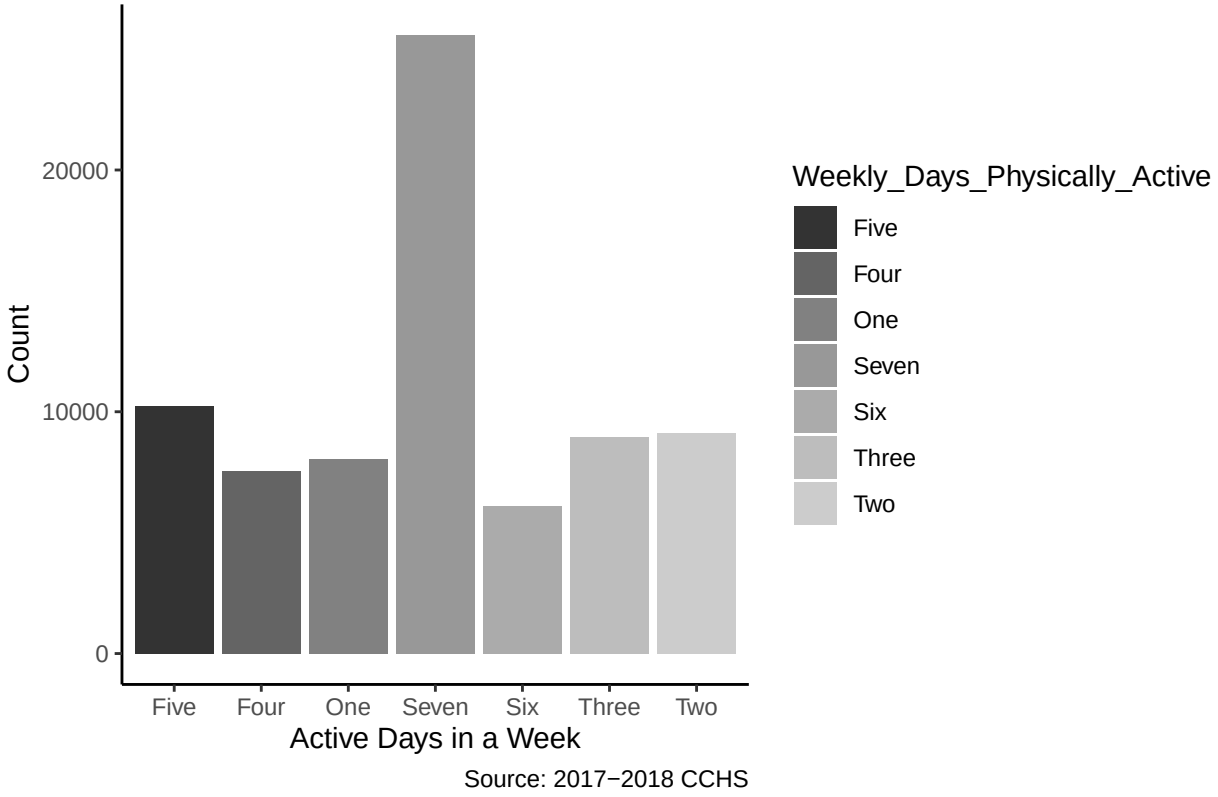
Source: 2017−2018 CCHS

Figure 5: Drug Use (Last 12 Months)



Source: 2017−2018 CCHS

Figure 6: Weekly Days Physically Active



Results

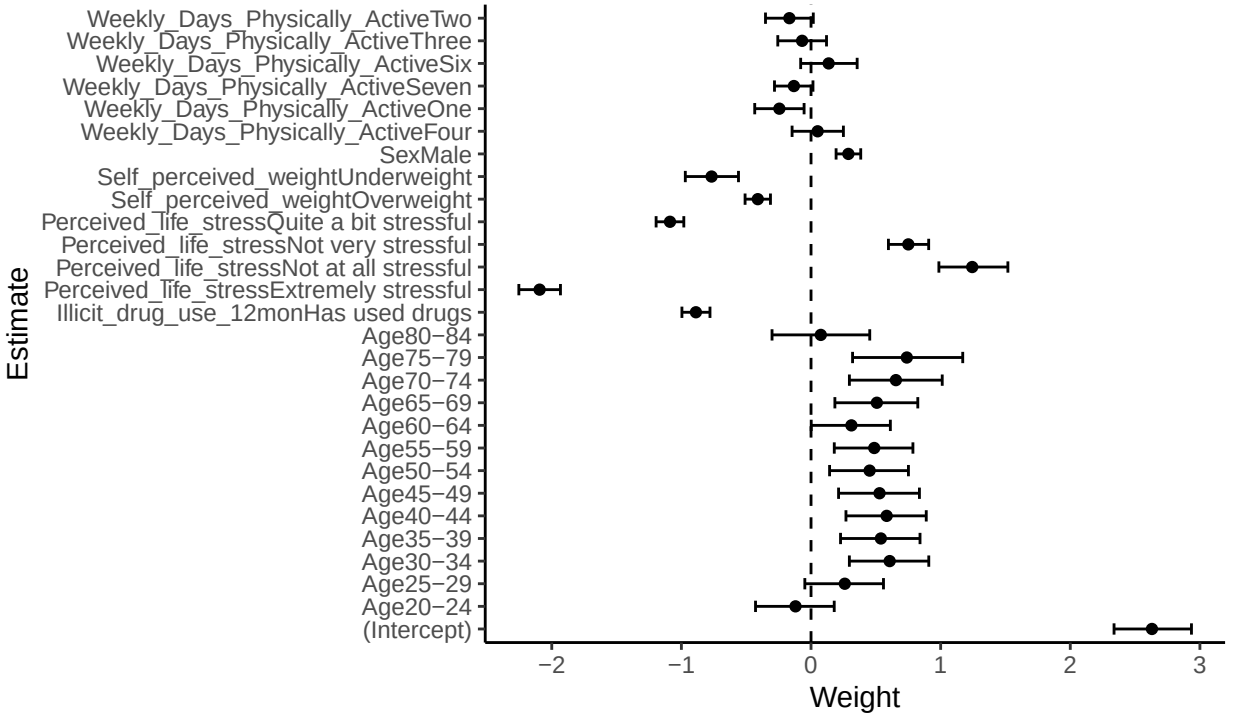
Figure 7: Basic Output of Logistic Regression Model

term	estimate	std.error	statistic	p.value	conf.low	conf.high
(Intercept)	2.6300351	0.1521829	17.2820628	0.0000000	2.3377417	2.9348413
Age20-24	-0.1196123	0.1546757	-0.7733099	0.4393390	-0.4280001	0.1790261
Age25-29	0.2605065	0.1545454	1.6856312	0.0918669	-0.0475730	0.5589572
Age30-34	0.6068530	0.1560942	3.8877355	0.0001012	0.2959656	0.9085804
Age35-39	0.5389647	0.1562137	3.4501744	0.0005602	0.2278036	0.8408723
Age40-44	0.5836165	0.1578334	3.6976733	0.0002176	0.2694753	0.8889035
Age45-49	0.5287059	0.1589275	3.3267116	0.0008788	0.2125272	0.8362463
Age50-54	0.4522299	0.1549836	2.9179200	0.0035237	0.1432553	0.7514848
Age55-59	0.4877257	0.1546146	3.1544612	0.0016079	0.1794267	0.7862107
Age60-64	0.3116404	0.1556071	2.0027391	0.0452053	0.0014577	0.6121305
Age65-69	0.5078095	0.1629688	3.1159918	0.0018333	0.1841838	0.8237767
Age70-74	0.6548086	0.1824150	3.5896644	0.0003311	0.2960885	1.0122306
Age75-79	0.7391859	0.2162908	3.4175557	0.0006319	0.3204926	1.1704639
Age80-84	0.0755587	0.1920079	0.3935184	0.6939366	-0.3007158	0.4531589
SexMale	0.2882268	0.0484614	5.9475606	0.0000000	0.1934438	0.3834328
Perceived_life_stressExtremely stressful	-2.0937272	0.0818088	-25.5929482	0.0000000	-2.2537286	-1.9329627

term	estimate	std.error	statistic	p.value	conf.low	conf.high
Perceived_life_stressNot at all stressful	1.2435677	0.1355478	9.1743831	0.0000000	0.9864405	1.5187574
Perceived_life_stressNot very stressful	0.7505473	0.0792035	9.4761870	0.0000000	0.5971722	0.9077929
Perceived_life_stressQuite a bit stressful	-1.0879255	0.0545064	-19.9595872	0.0000000	-1.1948620	-0.9811690
Self_perceived_weightOverweight	-0.4105442	0.0499308	-8.2222619	0.0000000	-0.5085766	-0.3128264
Self_perceived_weightUnderweight	-0.7671187	0.1045743	-7.3356346	0.0000000	-0.9696427	-0.5595194
Illicit_drug_use_12monHas used drugs	-0.8878977	0.0551986	-16.0855041	0.0000000	-0.9958252	-0.7794225
Weekly_Days_Physically_ActiveFour	0.0511695	0.1009126	0.5070680	0.6121071	-0.1459217	0.2498482
Weekly_Days_Physically_ActiveOne	-0.2441758	0.0970917	-2.5148983	0.0119067	-0.4342421	-0.0534822
Weekly_Days_Physically_ActiveSeven	-0.1321350	0.0756904	-1.7457291	0.0808580	-0.2817784	0.0150205
Weekly_Days_Physically_ActiveSix	0.1361618	0.1111093	1.2254761	0.2203959	-0.0798510	0.3559830
Weekly_Days_Physically_ActiveThree	-0.0686550	0.0958346	-0.7163907	0.4737502	-0.2562675	0.1195666
Weekly_Days_Physically_ActiveTwo	-0.1668447	0.0939701	-1.7755088	0.0758139	-0.3510019	0.0175090

Figure 8: Distribution of Estimation of Coefficients

Bars represent estimated error



Source: CCHS 2017−2018 Data

Figure 9: Logistic Regression Outputs with Confidence Intervals Present

Characteristic	**log(OR)**	**95% CI**	**p-value**
(Intercept)	2.6	2.3, 2.9	<0.001
Age			
18-19			
20-24	-0.12	-0.43, 0.18	0.4
25-29	0.26	-0.05, 0.56	0.092
30-34	0.61	0.30, 0.91	<0.001
35-39	0.54	0.23, 0.84	<0.001
40-44	0.58	0.27, 0.89	<0.001
45-49	0.53	0.21, 0.84	<0.001
50-54	0.45	0.14, 0.75	0.004
55-59	0.49	0.18, 0.79	0.002
60-64	0.31	0.00, 0.61	0.045
65-69	0.51	0.18, 0.82	0.002
70-74	0.65	0.30, 1.0	<0.001
75-79	0.74	0.32, 1.2	<0.001
80-84	0.08	-0.30, 0.45	0.7
Sex			
Female			
Male	0.29	0.19, 0.38	<0.001
Perceived_life_stress			
A bit stressful			
Extremely stressful	-2.1	-2.3, -1.9	<0.001
Not at all stressful	1.2	1.0, 1.5	<0.001
Not very stressful	0.75	0.60, 0.91	<0.001
Quite a bit stressful	-1.1	-1.2, -1.0	<0.001
Self_perceived_weight			
Just About Right			
Overweight	-0.41	-0.51, -0.31	<0.001
Underweight	-0.77	-1.0, -0.56	<0.001
Illicit_drug_use_12mon			
Has not used drugs			
Has used drugs	-0.89	-1.0, -0.78	<0.001
Weekly_Days_Physically_Active			
Five			
Four	0.05	-0.15, 0.25	0.6
One	-0.24	-0.43, -0.05	0.012
Seven	-0.13	-0.28, 0.02	0.081
Six	0.14	-0.08, 0.36	0.2
Three	-0.07	-0.26, 0.12	0.5
Two	-0.17	-0.35, 0.02	0.076

Model

This study uses a logistic regression model of the form:

$$log\left(\frac{\hat{p}}{1-\hat{p}}\right) = \beta_1 + \beta_2 * x_{PhysicalActivity} + \beta_3 * x_{Sex} + \beta_4 * x_{Weight} + \beta_5 * x_{Stress} + \beta_6 * x_{DrugUse} + \beta_7 * x_{AgeGroup}$$

References