Psychological Disorders Within Homeless Populations

Abstract

In the United States, there is a significantly higher proportion of individuals that suffer from serious mental illness in homeless populations compared to the overall population. Since mental illness is largely prevalent in the population of homeless people, we wanted to examine different variables that impact the likelihood of a person having a mental disorder within homeless populations, such as age and gender. Using the R statistical package, we analyzed data from a ICPSR survey of 908 homeless individuals that were randomly sampled from the DC Metropolitan area. We found, in general, the likelihood that a person in a homeless population will have a psychological disorder differs by age group, while it does not differ by gender. However, alcohol use was an exception to this, as a significantly larger proportion of homeless males were observed to drink heavily compared to females.

Introduction

Over the years, homelessness has consistently been a major problem around the world, especially within the United States. As homelessness continues to increase in our country for people of all ages and gender, its effects on individuals and communities continue to worsen. One consequence of homelessness is the way in which it can negatively affect the mental state of an individual.

According to the Substance Abuse and Mental Health Services Administration, about 20% of homeless people have a serious mental illness (Homelessness and Housing). This is significantly higher than the rate of people (homeless and non-homeless) with a serious mental illness in the United States, which is only 4% according to the National Institute of Mental Health (Serious Mental Illness). Since mental illness is largely prevalent in the population of homeless people, we wanted to examine different variables that impact the likelihood of a person having a mental disorder within homeless populations. We hypothesized that the likelihood that a homeless person will have a mental disorder significantly differs by factors such as age and gender.

Materials and Methods

In order to test our hypothesis, we found a data set that explored the characteristics of the Washington, DC Metropolitan area homeless population, including the relationship between homelessness and various measures of health. To collect this data, Inter-University Consortium for Political and Social Research conducted interviews with 908 homeless people on 64 randomly selected nights. According to the ICPSR, the homeless people were randomly sampled from those who spent the night in emergency shelters or hotels for homeless people, used soup kitchens, were in major encampments, or were in a geographic sample of census blocks in the 16 city and county municipalities that make up the DC metropolitan area.

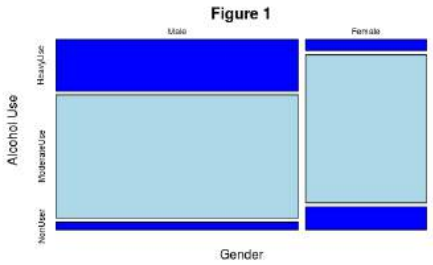
In order to quantify the associations between our outcome and predictor variables, we used various statistical tests to determine if each association was significant at the .05 level. First, we analyzed how alcohol use, depression, anxiety, and number of psychological problems ever experienced differ by gender in the sample of homeless people. For analyzing the association between gender and alcohol use, we performed a chi-square test. In order to analyze how depression and anxiety differ by gender, we performed a two-sample proportion test. To analyze how the average number of psychological problems differs by gender, we conducted a two-sample t-test and created a 5-number summary.

Next, we analyzed how alcohol use, depression, anxiety, and number of psychological problems ever experienced differ by age group within our homeless sample population. For analyzing how alcohol use, depression, and anxiety differ by age group, we performed a chi-square test. To analyze how the average number of psychological problems ever experienced differs by age group, we performed an analysis of variance F-test (ANOVA F-test) and created a 5-number summary. For all of our tests (chi-square, proportion tests, two-sample t-test, ANOVA F test) except one chi-square test, all conditions were met for all tests. The chi-square test that did not exactly meet conditions is addressed appropriately in the results and the discussion sections. We used the R statistical package to perform these tests, recode variables, label them, and make other modifications in order to perform our statistical analysis.

Results

The tests performed provided us with insight into the significance of our factors, age and gender, in terms of how they influence the likelihood that a homeless person will have a mental disorder. Our first test explored whether heavy alcohol consumption is associated with gender in homeless populations by running a chi-square test. We have statistically significant evidence that the proportion of heavy alcohol users, moderate users, and nonusers differs by gender in homeless populations ($X^2 = 70.9$, df = 2, p-value < 0.001). As seen in Figure 1 (the mosaic plot

below), a larger proportion of males reported heavy alcohol use compared to females than expected (28% for males and 6% for females as seen in Table 1 in the appendix). Additionally, a larger proportion of females reported moderate or "other" amounts of alcohol use compared to males than expected (81% for females and 67% for males as seen in Table 1), and a larger proportion of females reported not using alcohol than expected (13% for females and 4% for males).



We analyzed if the average number of psychological problems ever experienced differs by gender by using a two-sample t-test. Table 4 (a 5-number summary) shows that the mean number of psychological problems ever experienced by males is 3.49, while the mean for females is 3.51. This observation, along with the results of the two-sample t-test (t = -0.077 on 620.8 df, p-value = 0.939), show that the difference in the average number of psychological problems between males and females is not significant.

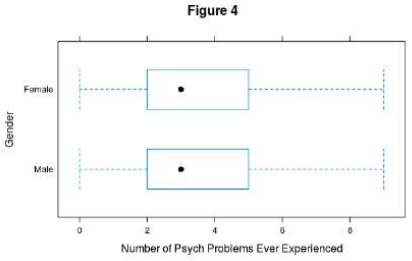
When testing to see whether the average number of psychological problems ever experienced differs by age group, we performed an analysis of variance F-test followed by Tukey's HSD. We found significant evidence that the average number of psychological problems experienced does differ by age group (F = 4.13 on 3 df, p-value = 0.0064) Tukey's HSD (Table 6) shows us that the only significant differences between age groups were found when comparing adults to older adults, and younger adults to adults. As seen in Table 6, we are 95% confident that on average, young adults (age 20-30) experience somewhere between 0.375 and 2.125 more psychological problems than older adults (age 55+). Also, we are 95% confident that on average, adults (age 31-54) experience between 0.370 and 2.071 more psychological problems than older adults.

As another consideration, we tested whether the proportion of alcohol users differed by age group by conducting a chi-square test. We found that the proportion of alcohol users does significantly differ by age group (X^2 = 47.2, df = 6, p-value < 0.001). Furthermore, the "Teen", "Young Adult" and "Adult" age groups observed proportions all differed from what we expected assuming the null hypothesis to be true. Only the "Older Adult" age group had observed proportions similar to what was expected. While we found the chi-square test to be very significant, it should be noted that this chi-square approximation may be incorrect because it does not exactly meet the normality condition of a chi-square test (at least 5 cases in each cell).

Finally, when testing to see whether a relationship exists between anxiety and age group, we performed a chi-square test. We found statistically significant evidence anxiety differs by age group (X^2 = 13.6 on 3 df, p-value = 0.0036). When comparing the expected and observed counts, we only observe a greater proportion of adults reported having experienced anxiety than expected. All other age groups had a smaller proportion of people that reported experiencing anxiety than expected.

Discussion

After completing all of our tests, we found that, generally speaking, the likelihood that a person in a homeless population will have a psychological disorder differs by age group, while it does not differ by gender. However, alcohol use was an exception to this, as a significantly larger proportion of homeless males were observed to drink heavily compared to females. When testing to see whether gender played a role in determining the number of psychological problems experienced by a homeless person, we found that the average number of psychological



problems experienced by a person from each gender was nearly identical (as seen in Figure 4 on the right).

This provides strong evidence that in homeless populations, the true average number of psychological problems ever experienced does not significantly differ between genders. Alternatively, when determining whether the average number of psychological problem ever experienced differs by age group, we expected the average number of psychological problems to increase with age because the longer someone is alive, the more time they have to experience psychological issues. However, as seen in Table 4 in the appendix, we discovered that older adults (people over the age of 55) on average reported a fewer number of psychological problems ever experienced than all other age groups. This observed difference was found to be statistically significant between older adults and adults (age 31-54), as well as between older adults and young adults (20-30). The observed difference between older adults and teens (age 19 and below) was not significant at the .05 level, but a noticeable difference in means still existed.

As decades have passed, diagnostic techniques as well as our knowledge and awareness of psychological problems have improved. We speculate that this increase in diagnostics and awareness is a confounding variable, and caused more teens, young adults, and adults (all under age 55) to be aware of their psychological problems, whereas older adults more often went undiagnosed.

Our sample of 908 homeless people should adequately represent the homeless population in the DC area because the ICPSR was very intricate in implementing random sampling. According to the ICPSR, the homeless people were randomly sampled from those who spent the night in emergency shelters or hotels for homeless people, used soup kitchens, were in major encampments, or were in a geographic sample of census blocks in the 16 city and county municipalities that make up the DC metropolitan area. Since our data consists of homeless people randomly sampled from the homeless population in the D.C. metropolitan area, it is acceptable to generalizable our results to other homeless populations in metropolitan cities in the United States.

One limitation of our analysis involves our chi-square test between age group and alcohol use. In order to pass the normality condition for a chi-square test, there should be at least 5 people expected in each combination of age group and level of alcohol use. However, the expected number of teens that were heavy alcohol users was only 2.55, and the expected number of older adults that were nonusers was only 2.89. Since the normality condition for the chi-square test was not exactly met, the results of the chi-square test may be inaccurate. However, since there were very significant differences for the observed and expected counts of young adults and adults, and the differences for the observed and expected counts of teens and older adults was minimal, we believe our chi-square test was acceptable and still produced valid results.

A weakness in our analysis of the data is that we based our analysis on psychological problems and disorders but did not have data on homeless people who had alcoholism (a psychological disorder). Instead, we considered heavy alcohol use to be a psychological problem. This may be the case sometimes, but other times heavy alcohol use may have nothing to do with a person's psychological state. As an idea for future research, we can collect data on alcoholism within homeless populations. This will allow us to see if alcoholism differs by age group but not gender, as observed for other psychological disorders.

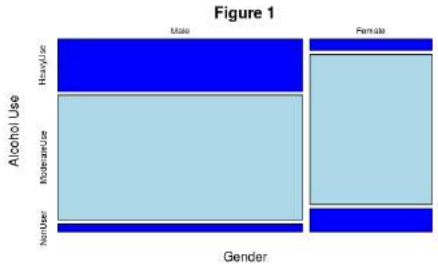
Work Cited

"Homelessness and Housing." *Substance Abuse and Mental Health Services Administration*, www.samhsa.gov/homelessness-housing. Accessed 8 Dec. 2017.

"Serious Mental Illness (SMI) Among U.S. Adults." *National Institute of Mental Health*, www.nimh.nih.gov/health/statistics/prevalence/serious-mental-illness-smi-among-us adults.shtml. Accessed 8 Dec. 2017.

Appendix

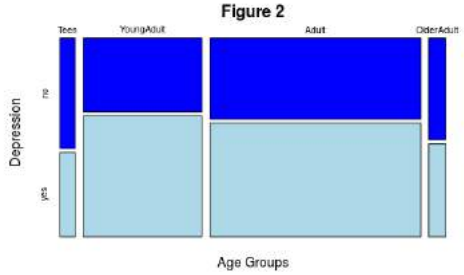
Figure 1



Gender	AlcoholUse		
	HeavyUse	ModerateUse	NonUser
Male	0.28286190	0.67387687	0.04326123
Female	0.06312292	0.81063123	0.12624585

Table 1

Figure 2



	Depression	
AgeGroup	no	yes
Teen	0.5675676	0.4324324
YoungAdult	0.3793103	0.6206897
Adult	0.4163424	0.5836576
OlderAdult	0.5238095	0.4761905

Table 2

Figure 3

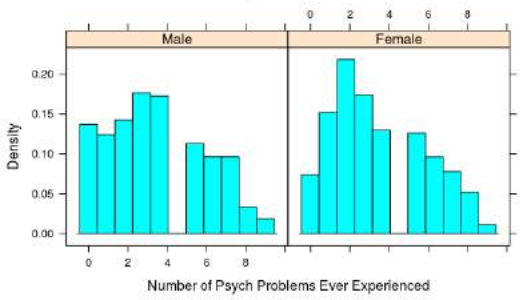
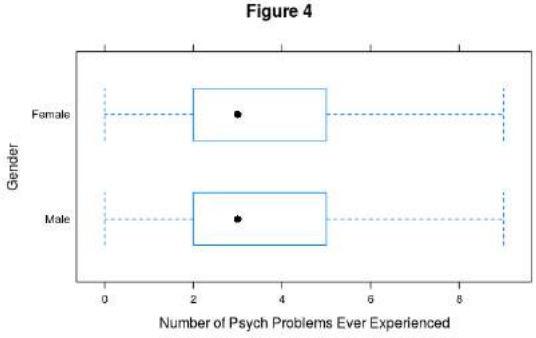


Figure 4



	Gender2	min	Q1	median	Q3	max	mean	sd	n	missing
1	Male	0	2	3	5	9	3.494157	2.353298	599	0
2	Female	0	2	3	5	9	3.506667	2.258382	300	0

Table 3

Figure 5

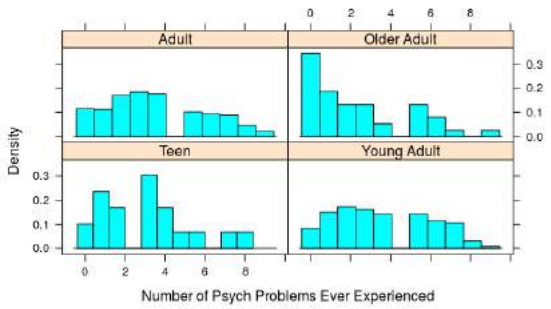
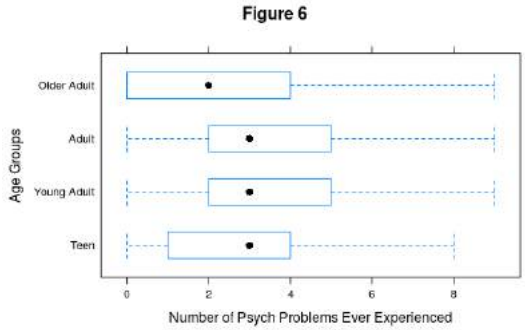


Figure 6



	Homelessness7$AgeGroups2	min	Q1	median	Q3	max	mean	sd	n
1	Teen	0	1	3	4	8	3.135135	2.187873	37
2	Young Adult	0	2	3	5	9	3.606897	2.253169	290
3	Adult	0	2	3	5	9	3.577821	2.342666	514
4	Older Adult	0	0	2	4	9	2.357143	2.387175	42

Table 4

Figure 7

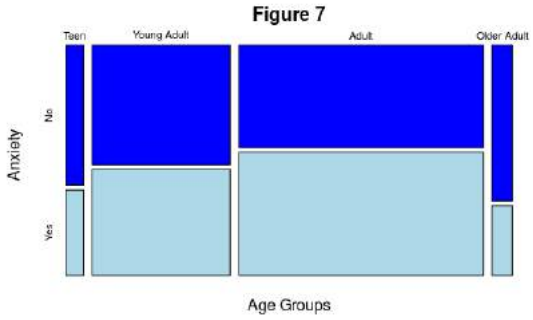
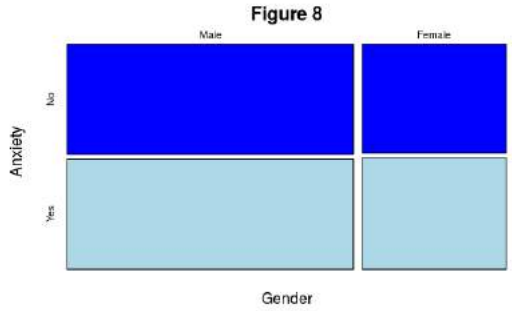


Figure 8



AgeGroup	AlcoholUse Heavy	Moderate	None
Teen	2	26	9
Young Adult	36	230	24
Adult	140	351	25
Older Adult	10	29	3

Table 5

Figure 9

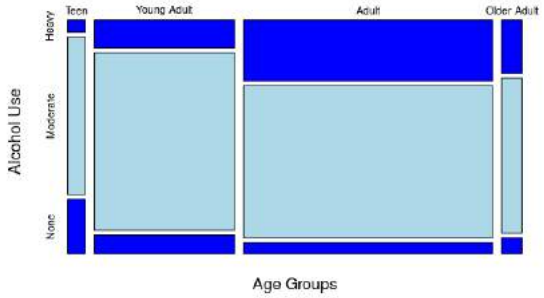
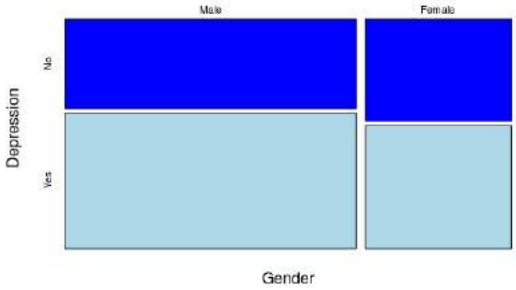


Figure 10



AgeGroups

	diff	lwr	upr	p adj
Young Adult-Teen	0.47176142	-0.4534314	1.3969543	0.6459208
Adult-Teen	0.44268588	-0.4594078	1.3447795	0.6734858
Older Adult-Teen	-0.77799228	-1.9729328	0.4169482	0.4415070
Adult-Young Adult	-0.02907554	-0.4183050	0.3601539	0.9982092
Older Adult-Young Adult	-1.24975369	-2.1247448	-0.3747626	0.0059822
Older Adult-Adult	-1.22067815	-2.0712078	-0.3701485	0.0056694

Table 6

Secondary Analysis

When testing whether the proportion of homeless people with anxiety differs by gender, we performed a chi-square test. This test showed the difference is not significant (X^2 = 0.045, df = 1, p-value = 0.832), as the proportion of females with anxiety is very close to that of males with anxiety. We had similar results when testing whether the proportion of homeless people with depression differs by gender. We conducted a two-sample proportion test in this case and found that the difference between the proportion of males with depression compared to females is not significantly different (X^2 = 2.36, df = 1, p-value = 0.125).

Also, we explored whether or not depression was associated with age in homeless populations with a chi-square test. We found that there is not statistically significant evidence at the .05 level that depression is associated with age group (X^2 = 7.12, df = 3, p-value = .068).