Commands for packages and files: library(ggplot2)

install.packages("car")

install.packages("pastecs")

install.packages("psych")

library(car)

library(psych)

library(pastecs)

burnoutData<-read.delim("C:/Users/kurti/OneDrive/Documents/R/Data files/Burnout.dat", header = TRUE)

Commands: burntData<-subset(burnoutData, burnoutData$burnout=="Burnt Out")

notburntD<-subset(burnoutData, burnoutData$burnout=="Not Burnt Out")

histburnt<-ggplot(burntData, aes(research)) + geom\_histogram(aes(y = ..density..), fill = "white", colour = "black", binwidth = 4) + labs(x = "Stress Caused By Research", y = "Density") + stat\_function(fun=dnorm, args=list(mean = mean(burntData$research, na.rm = TRUE), sd = sd(burntData$research, na.rm = TRUE)), colour = "red", size=1)

histnotBurnt<-ggplot(notburntD, aes(research)) + geom\_histogram(aes(y = ..density..), fill = "white", colour = "black", binwidth = 4) + labs(x = "Stress Caused By Research", y = "Density") + stat\_function(fun=dnorm, args=list(mean = mean(burntData$research, na.rm = TRUE), sd = sd(burntData$research, na.rm = TRUE)), colour = "red", size=1)

burntqq<-qplot(sample=burntData$research)

notBurntqq<-qplot(sample=notburntD$research)

 a. Burnt Out Lecturers

Q-Q plot  


The histogram for burnt out lecturers who are stressed based off the variable of research shows kind of a normal distribution for stress ratings. However, it does have some low response density in the middle of the graph. The Q-Q Plot seems to be slightly skewed, specifically at the start of the graph.

Not Burnt Out Lecturer



Q-Q plot



The histogram for lecturers who are not burnt out seems to be close to a normal distribution, but it seems to have a slight negative skew. The Q-Q plot seems to have a good normal distribution because the plot is relatively straight.

b. Commands: by(data = burnoutData$research, INDICES = burnoutData$burnout, FUN = stat.desc, basic = FALSE, norm = TRUE)

Data from subset Burnt Out and Not Burnt Out

burnoutData$burnout: Burnt Out

median mean SE.mean CI.mean.0.95 var std.dev

58.33333333 58.98109244 1.34853432 2.67046508 216.40683109 14.71077262

coef.var skewness skew.2SE kurtosis kurt.2SE normtest.W

0.24941506 0.03736490 0.08423784 -0.54779832 -0.62236086 0.98831199

normtest.p

0.40231977

Kurtosis = -.5478

Skewness = .0374

Both the skewness and kurtosis are close to 0 which implies that the data of the burnt out lecturers is a normal distribution. Kurtosis my be affecting the data slightly because it has a slightly high value, however the kurtosis divided by 2SE suggests that the kurtosis value is not significant.

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burnoutData$burnout: Not Burnt Out

median mean SE.mean CI.mean.0.95 var

62.500000000 62.907088123 0.784541731 1.543055509 214.195993482

std.dev coef.var skewness skew.2SE kurtosis

14.635436225 0.232651624 -0.003441592 -0.013161449 -0.400923812

kurt.2SE normtest.W normtest.p

-0.768768616 0.994053952 0.191894529

Kurtosis = -.4009

Skewness = -.0034

Both the skewness and kurtosis are close to 0 which implies that the data of the not burnt out lecturers is a normal distribution.

c. Commands: by(burnoutData$research, burnoutData$burnout, shapiro.test)

burnoutData$burnout: Burnt Out

Shapiro-Wilk normality test

data: dd[x, ]

W = 0.98831, p-value = 0.4023

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burnoutData$burnout: Not Burnt Out

Shapiro-Wilk normality test

data: dd[x, ]

W = 0.99405, p-value = 0.1919

The burnt out lecturers, W = .988, p>.05, the not burnt out lecturers, W = .994, p>.05.

Both p-values are above .05 which suggests that both data sets of the lecturers are normal distributed.

Overall, after completing all the tests for normality within the data, the tests imply that the data sets of the two types of lecturers are normally distributed.

2. a. Commands: leveneTest(burnoutData$research, burnoutData$burnout, center = mean)

Levene's Test for Homogeneity of Variance (center = mean)

For the ratings based off of stress levels felt from research, the variances were similar for both Burnt Out and Not Burnt Out lecturers. F(1, 465)=.1326, with p=.1716. The high p-value indicates that the different variances between the two different types of lecturers is not significant.

b.

Burnt Out Variance= 216.4

Not Burnt Variance= 214.2

Variance Ratio: 216.4/214.2

=1.01

This Fmax suggests that the difference in variances between the two groups of lecturers is non-significant.

Overall, the variance tests indicate that the variance does not change significantly between the different groups of lecturers.