Exploring the BRFSS data

Setup

Load packages

```
library(ggplot2)
library(dplyr)
```

Load data

```
load("brfss2013.RData")
```

Part 1: Data

The data used in this analysis is part of the 2013 Behavioral Risk Factor Surveillance System (BRFSS) survey collected by the Centers for Disease Control and Prevention.This observational study collects state and local health information regarding U.S residents 18 years of age or older via telephone. The survey is conducted throughout the year and subjects are selected via Random Digit Dialing techniques on both cellular phones and landlines. With the landline participants being randomly selected adults in the household and cellular participants are adults who reside in private or college housing.

The study included more than 400,000 adults in 3 U.S. territories, DC, and all 50 states. The random sampling method used helps to decrease the potential for bias, however, because this is a self-reporting survey, there may be instances of response bias that may have influenced the participants responses.

The survey consisted of three parts: 1. the core component, 2. the Optional BRFSS modules, and 3. State added questions.

All of the data used in this analysis was taken from the core component of the survey. This analysis doesn't include "NA" responses for the "exerany2" variable.

Part 2: Research questions

Research quesion 1: Does exercising impact respondents perception of their mental health status?

Addressing this question, we can gain insight into what, if any, role exercising may play in how one gauges their own daily mental health status?

Research quesion 2: Does exercising, based on one's gender, play a role in an indidvidual's overall determination of their mental health status?

If exercise really does impact how one feels regarding their mental health state, then what role does gender play in this? The importance of this question is to determine if one gender, male or female, is impacted more or if there is no real difference.

Research quesion 3:

Does marital status along with participating in exercise impact how respondents gauge their own daily mental health status?

The importance of this question is to learn how persons of differenct marital statuses who participate in exercise feel regarding their mental health status. We will learn if those of different marital statuses are impacted at the same or differing levels.

Part 3: Exploratory data analysis

**Preliminary Data

The descriptive summary data shown below displays that the average days that respondents felt that their mental health was not good out of 30 days was around 3.4 days.

```
summary(brfss2013$menthlth, na.rm=TRUE)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.     NA's
##    0.000    0.000    0.000    3.383    2.000 5000.000     8627
```

Research quesion 1:

```
brfss2013 %>%
  group_by(exerany2) %>%
  summarise(mean(menthlth, na.rm=TRUE), sd(menthlth, na.rm=TRUE))
```

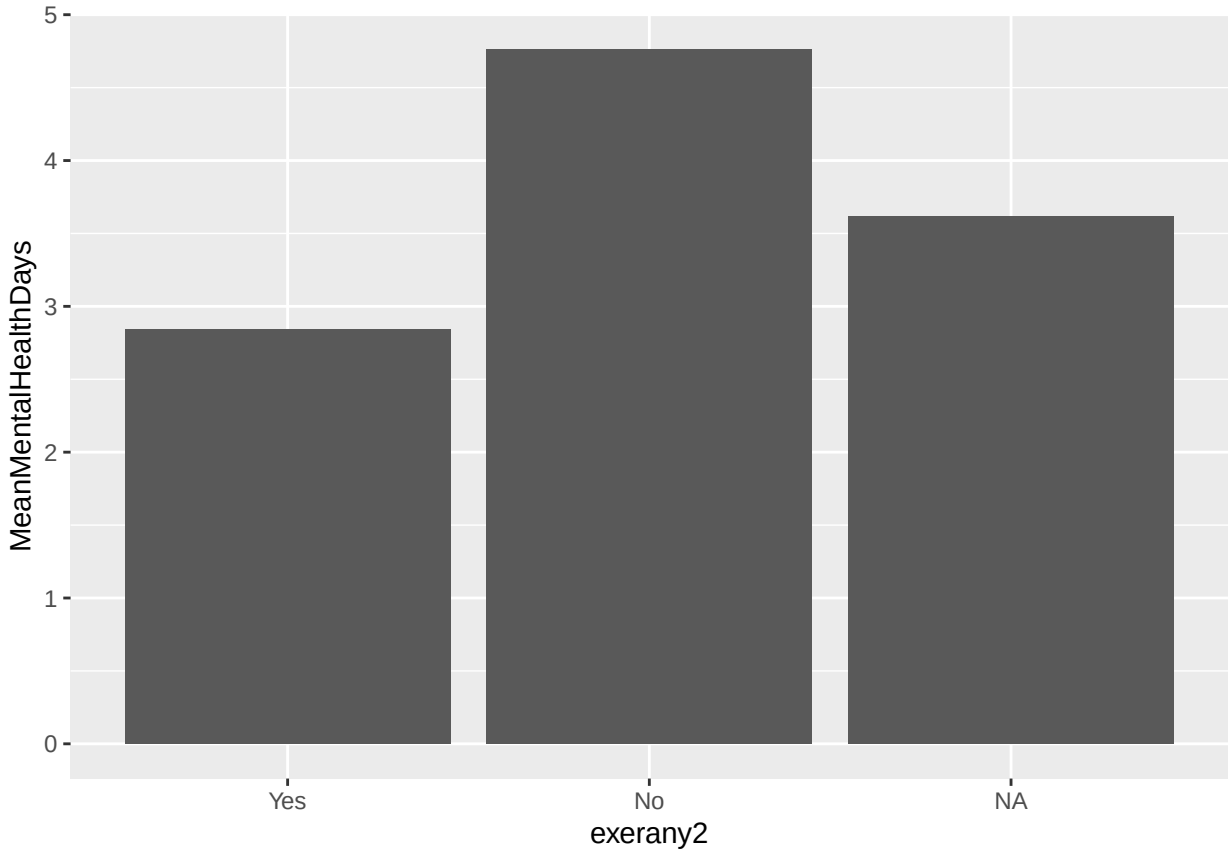
```
## Warning: Factor `exerany2` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
## # A tibble: 3 x 3
##   exerany2 `mean(menthlth, na.rm = TRUE)` `sd(menthlth, na.rm = TRUE)`
##   <fct>                             <dbl>                       <dbl>
## 1 Yes                                2.84                        6.91
## 2 No                                 4.76                        9.29
## 3 <NA>                               3.62                       28.6
```

```
data1 <-brfss2013 %>% group_by(exerany2) %>% summarise(MeanMentalHealthDays = mean(menthlth, na.rm=TRUE)
```

```
## Warning: Factor `exerany2` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
library(ggplot2)
ggplot(aes(x = exerany2, y = MeanMentalHealthDays), data = data1) + geom_bar(stat = "identity")
```



The average number of days that a respondent felt that they mental health is not good is higher among those who responded that they had not participated in any type of exercise during the previous 30 day period.Those who had exercised, on average felt that their mental health was not good an average of 2.8 days and those who had not exercised during the previous 30 days felt this way about 4.8 days. This is a difference of 2 days.

Research quesion 2:

```
data2 <-brfss2013 %>% group_by(sex,exerany2) %>% summarise(MeanMentalHealthDays = mean(menthlth, na.rm='
```

```
## Warning: Factor `sex` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
## Warning: Factor `exerany2` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
print(data2)
```

```
## Warning: Factor `sex` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

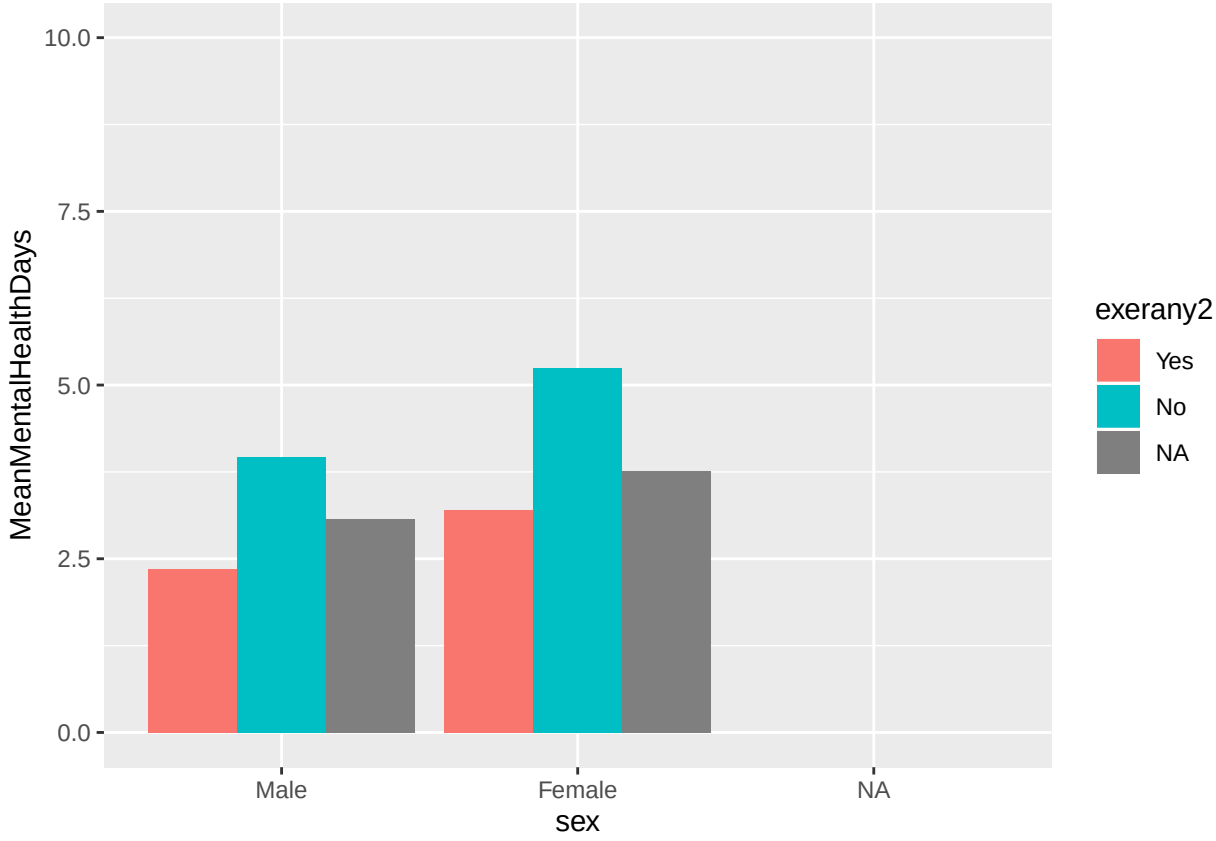
```
## # A tibble: 9 x 3
## # Groups:   sex [3]
##   sex    exerany2 MeanMentalHealthDays
##   <fct>  <fct>                   <dbl>
## 1 Male   Yes                      2.35
## 2 Male   No                       3.97
## 3 Male   <NA>                     3.07
## 4 Female Yes                      3.20
## 5 Female No                       5.24
## 6 Female <NA>                     3.76
```

```
## 7 <NA>   Yes                    NaN
## 8 <NA>   No                     NaN
## 9 <NA>   <NA>                  1749
```

```
library(ggplot2)

ggplot(data = data2, aes(x=sex, y= MeanMentalHealthDays, fill = exerany2)) +geom_bar(stat = "identity",
```

```
## Warning: Removed 3 rows containing missing values (geom_bar).
```



Overall, when compared to males, females reported having more days where they felt that their mental health was not good whether they exercised or not. females who reported not exercising also reported having an average of about 1.27 more days where their mental health was not good compared with males who had not exercised. Of those male and females who reported exercising over the past 30 days, females reported an average of 3 days as opposed to males reporting a little over 2 days feeling that their mental health was not good.

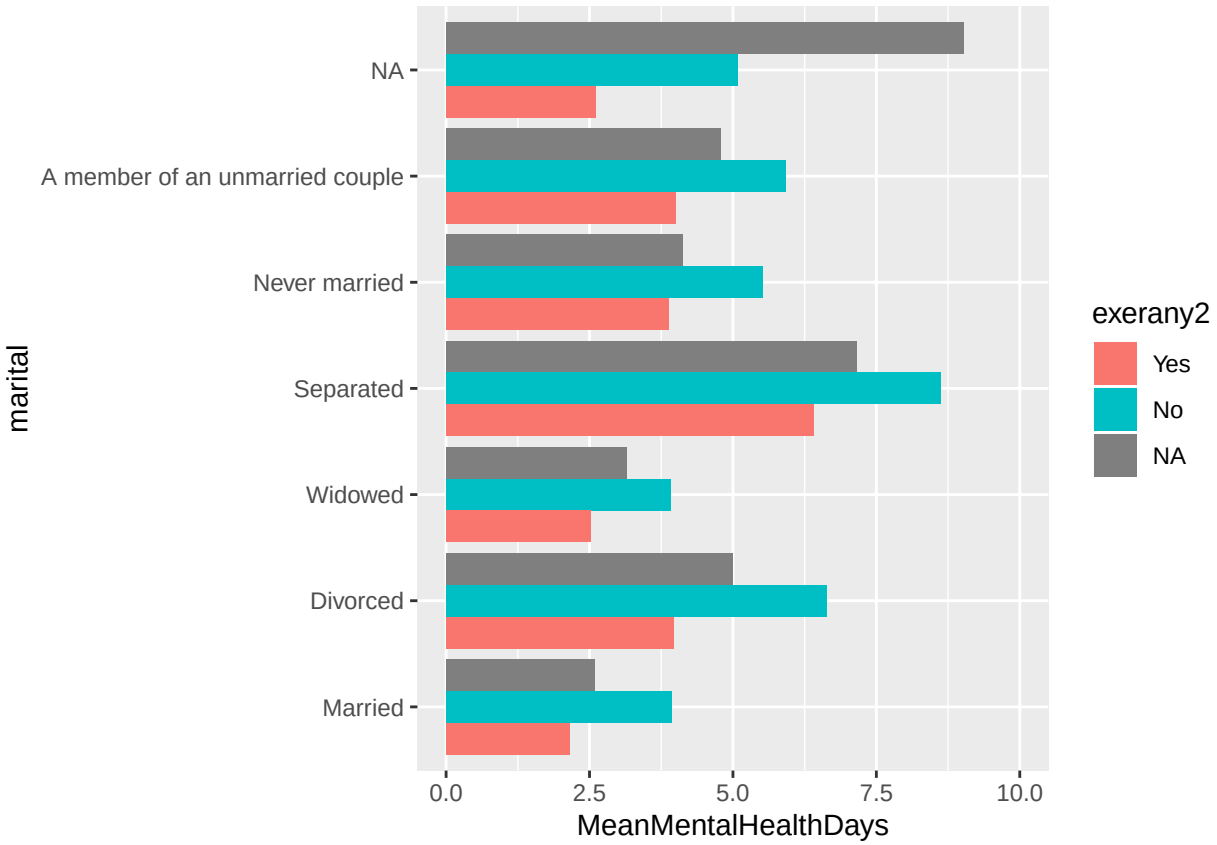
Research quesion 3:

```
data3 <-brfss2013 %>% group_by(marital,exerany2) %>% summarise(MeanMentalHealthDays = mean(menthlth, na
```

```
## Warning: Factor `marital` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
## Warning: Factor `exerany2` contains implicit NA, consider using
## `forcats::fct_explicit_na`
```

```
library(ggplot2)
ggplot(data = data3, aes(x=marital, y= MeanMentalHealthDays, fill = exerany2)) +geom_bar(stat = "identi
```



This data set shows that those who are separated report having more days of feeling that their mental health was not good whether they exercised or not. For those that did and didn't exercise, they reported having an average of 6.4 and 8.6 days of feeling that their mental health was not good respectively. This outpaces all of the other marital statuses.