Final Project: Sodium Data Levels in hospital Patients

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Introduction

Our general research topic is to determine the level of sodium in admitted patients. Throughout the data, the sodium level is either flagged or not, further variables would describe the admitted patients' sodium level as low, normal, or high.

Based on the data provided, the purpose of our research is to determine the median age of each level of sodium.

Prerequistes

The following packages need to be downloaded from the library

```
library(tidyverse)
library(ggplot2)
library(pivottabler)
```

Data description

```{r}
glimpse(Sodium_Data)
```

```
Rows: 497
Columns: 4
$ Sodium                <dbl> 134, 124, 131, 134, 133, 124~
$ Sodium.missing.flag   <chr> "No", "No", "No", "No", "No"~
$ Age..Unit.Entry.      <int> 67, 63, 79, 77, 74, 62, 68, ~
$ Levels                <chr> "Low", "Low", "Low", "Low", ~
```

- We created this data from the original csv. It contains Sodium points, Sodium Missing flags, Age at the Entry, and Levels.

Sodium Missing

```
## What does "missing sodium" represent - how is the data "managed"?
```{r}
Sodium_Data%>%
  filter(Sodium.missing.flag == "Yes")
```
```

Description: df [55 x 3]

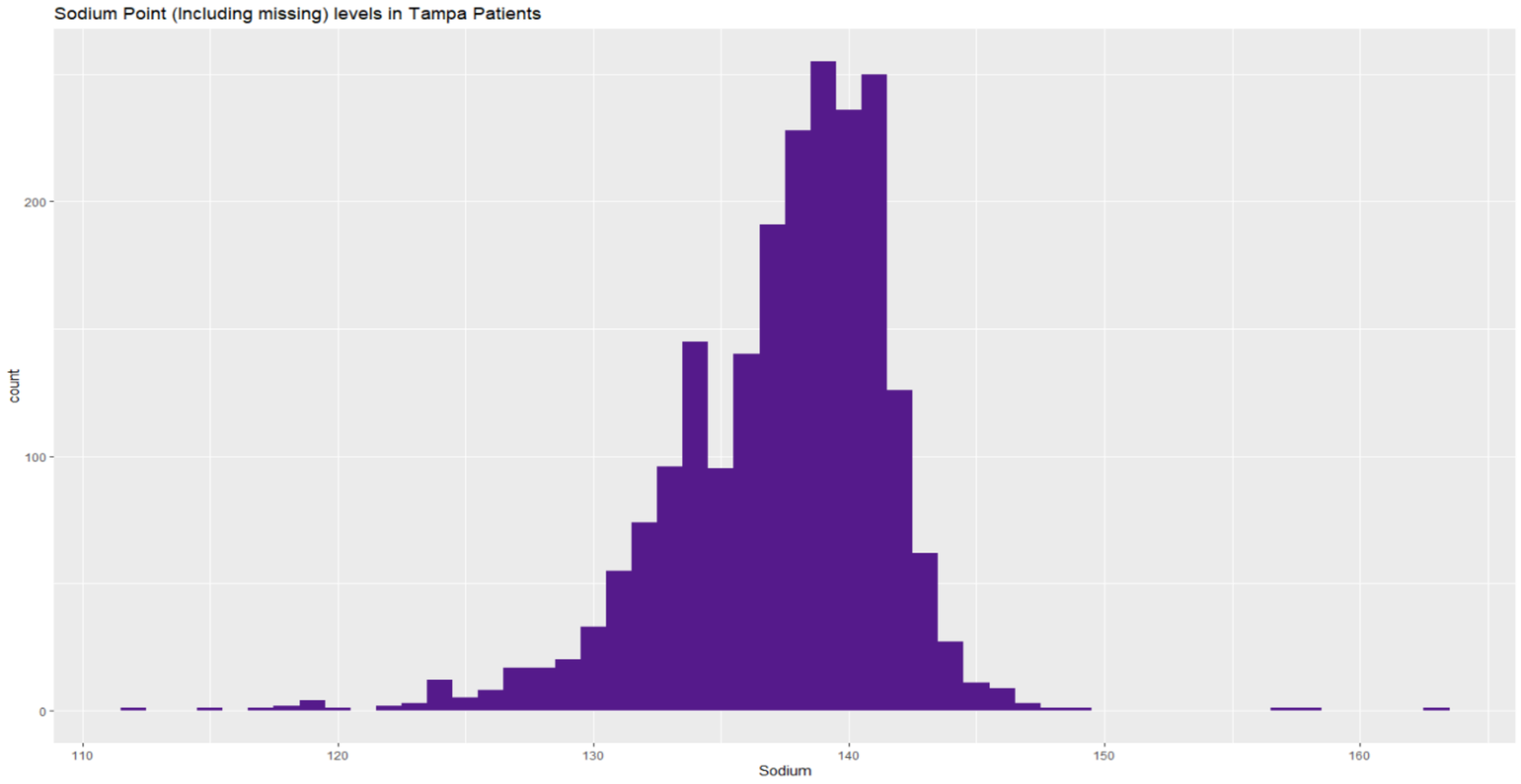
Sodium <dbl>	Sodium.missing.flag <chr>	Levels <chr>
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal
141.5	Yes	Normal

- Missing sodium means when the patient has enough sodium in their body to show they did not set off a test that could mean they are critically ill.

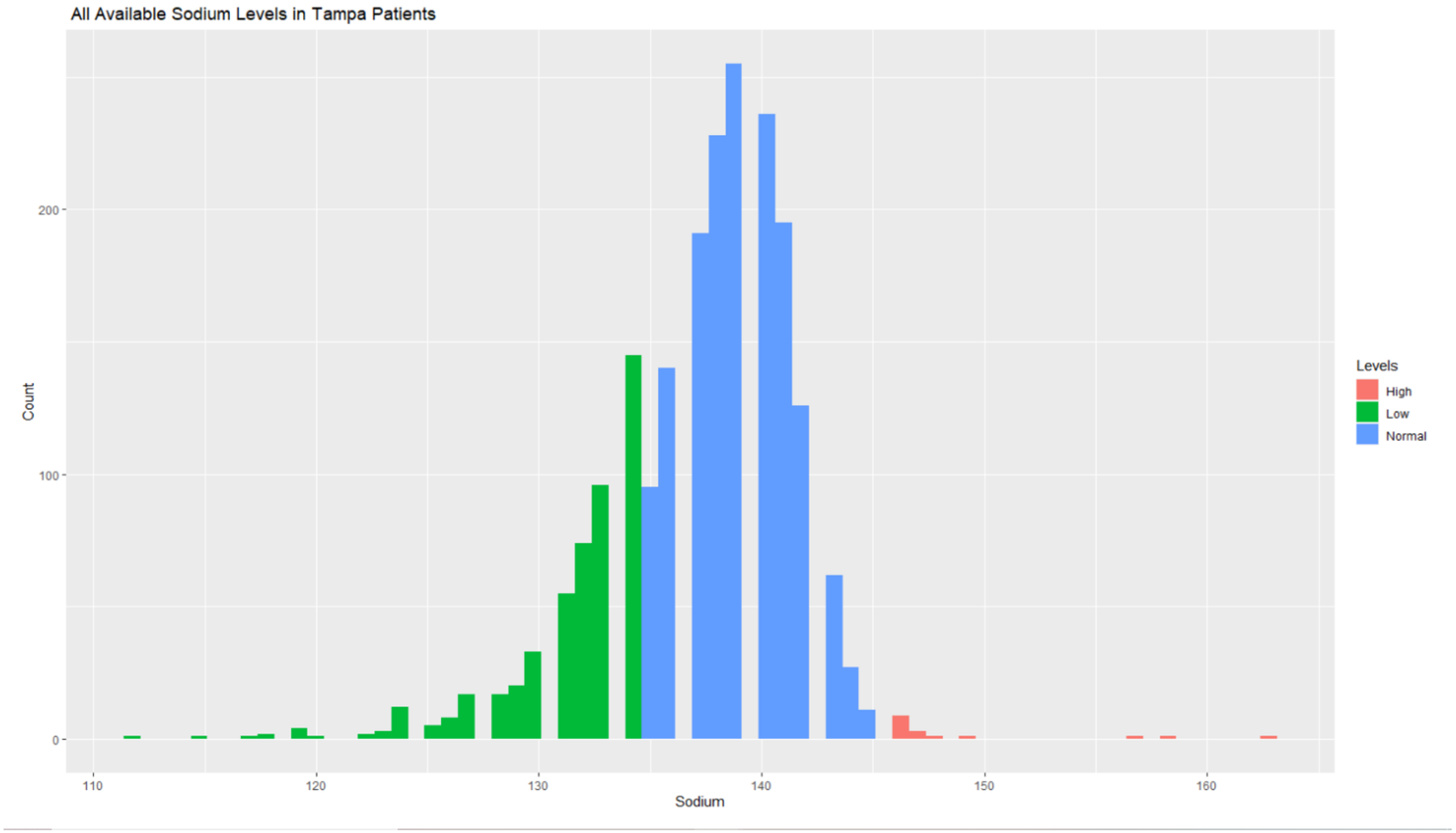
Data Analysis

In this data we made a histogram of all the sodium points including the missing points. This ranged between 112 and 163

```r
Sodium_Data %>%
  ggplot() +
  geom_histogram(aes( x = Sodium), binwidth = 1, fill = "Purple4") +
  labs(title = "Sodium Point (Including missing) levels in Tampa Patients")
```



Sodium Level



- When sodium levels in the blood are lower than 135 meq/l, it is a condition called Hyponatremia.
- Sodium levels between 135 and 145meq/l are within the normal range.
- When sodium levels in the blood are higher than 145 meq/l, it is a condition called Hypernatremia.

The median age for Low sodium levels in Tampa Patients is 67 years old.

```{r}
Sodium_levels <- Sodium_Data %>%
  filter(Sodium.missing.flag == "No")%>%
  filter(Levels == "Low")%>%
  mutate(
    median_Age_Low = median(Age..Unit.Entry.)
  )
 Sodium_levels
```

The median age for normal sodium levels in Tampa is 67 years old.

```{r}
Sodium_levels <- Sodium_Data %>%
  filter(Sodium.missing.flag == "No")%>%
  filter(Levels == "Normal")%>%
  mutate(
    median_Age_Normal = median(Age..Unit.Entry.)
  )
 Sodium_levels
```

The median age for High sodium levels in Tampa is 66 years old.

```{r}
Sodium_levels <- Sodium_Data %>%
  filter(Sodium.missing.flag == "No")%>%
  filter(Levels == "High")%>%
  mutate(
    median_Age_High = median(Age..Unit.Entry.)
  )
Sodium_levels
```

Conclusion

- In conclusion, based on our data analysis and our research question provided us the answer that there was a median age level that corresponded with a specific sodium level group.
- This means that there was a common age that was found in a respective sodium level group, despite there being a few outliers. We learned that these sodium levels are result of underlying health conditions.

Citations

- Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/hyponatremia/symptoms-causes/syc-20373711

- Annals of intensive care https://annalsofintensivecare.springeropen.com/articles/10.1186/s13613-018-0442-2