Logistic regression 23-March-2021

library(ggplot2)  
library(dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library(tidyverse)

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.0 ──

## ✓ tibble 3.1.0 ✓ purrr 0.3.4  
## ✓ tidyr 1.1.3 ✓ stringr 1.4.0  
## ✓ readr 1.4.0 ✓ forcats 0.5.1

## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag() masks stats::lag()

library(arsenal)  
library(data.table)

##   
## Attaching package: 'data.table'

## The following object is masked from 'package:purrr':  
##   
## transpose

## The following objects are masked from 'package:dplyr':  
##   
## between, first, last

library(expss)

##   
## Attaching package: 'expss'

## The following objects are masked from 'package:data.table':  
##   
## copy, like

## The following objects are masked from 'package:stringr':  
##   
## fixed, regex

## The following objects are masked from 'package:purrr':  
##   
## keep, modify, modify\_if, transpose, when

## The following objects are masked from 'package:tidyr':  
##   
## contains, nest

## The following objects are masked from 'package:dplyr':  
##   
## between, compute, contains, first, last, na\_if, recode, vars

## The following object is masked from 'package:ggplot2':  
##   
## vars

library(ggsci)  
library(sjPlot)  
library(sjmisc)

## Install package "strengejacke" from GitHub (`devtools::install\_github("strengejacke/strengejacke")`) to load all sj-packages at once!

##   
## Attaching package: 'sjmisc'

## The following objects are masked from 'package:expss':  
##   
## add\_columns, add\_rows, rec

## The following object is masked from 'package:arsenal':  
##   
## %nin%

## The following object is masked from 'package:purrr':  
##   
## is\_empty

## The following object is masked from 'package:tidyr':  
##   
## replace\_na

## The following object is masked from 'package:tibble':  
##   
## add\_case

library(sjlabelled)

##   
## Attaching package: 'sjlabelled'

## The following object is masked from 'package:expss':  
##   
## read\_spss

## The following object is masked from 'package:arsenal':  
##   
## set\_labels

## The following object is masked from 'package:forcats':  
##   
## as\_factor

## The following object is masked from 'package:dplyr':  
##   
## as\_label

#ideas, stratify by what do you consider a good nights sleep  
#additive index according to behaviors   
#regression models for the outcome.  
  
#Positive quality of sleep -   
#Consistent wake up   
#Greater than 7 hrs to 9 hrs --> stratify #for sure USE THIS AND ONE OR THE OTHER  
 #Agreement questions Q44  
 #Current bedtime routines  
 #Current lifestyle habits  
 #Employment and children

analysisdata <- readRDS("foranalysis.rds")

#Binary variable for seven or nine weighted as 1  
analysisdata <- analysisdata %>% mutate(  
 sevenornine = case\_when(  
 Q10\_workdayhoursofsleep >= 7.0 & Q10\_workdayhoursofsleep <= 9.0 ~ 1,  
 Q10\_workdayhoursofsleep < 7.0 | Q10\_workdayhoursofsleep > 9.0 ~ 0,  
 is.na(Q10\_workdayhoursofsleep) ~ NA\_real\_  
 ))  
  
  
#analysisdata <- analysisdata %>% mutate(  
# sevenornine = case\_when(  
# Q10\_workdayhoursofsleep >= 7.0 & Q10\_workdayhoursofsleep <= 9.0 ~ 2,  
# Q10\_workdayhoursofsleep < 7.0 | Q10\_workdayhoursofsleep > 9.0 ~ 0,  
# is.na(Q10\_workdayhoursofsleep) ~ NA\_real\_  
# ))  
  
#Binary variable for quality of sleep weighted as 1  
analysisdata <- analysisdata %>% mutate(  
 quality = case\_when(  
 Q44\_6\_ifeelpositiveaboutthequalityofmysleep == "Somewhat agree" ~ 1,  
 Q44\_6\_ifeelpositiveaboutthequalityofmysleep == "Strongly agree" ~ 1,  
 is.na(Q44\_6\_ifeelpositiveaboutthequalityofmysleep) ~ NA\_real\_,  
 TRUE ~ 0))  
  
#Binary variable for consistency of wake up weighted as 1  
analysisdata <- analysisdata %>% mutate(  
 consistency = case\_when(  
 Q13\_consistentwakeup == "Yes" ~ 1,  
 is.na(Q13\_consistentwakeup) ~ NA\_real\_,  
 TRUE ~ 0))  
  
#Compositescore computation  
analysisdata <- analysisdata %>% mutate(  
 compositescore = sevenornine + quality + consistency  
 )  
  
#analysisdata <- analysisdata %>% mutate(compositeoutcomegoodsleep = factor(compositescore, label = c("score 0 - worst sleep", "score 1", "score 2", "score 3 - best sleep"))) %>%  
# filter(!is.na(compositescore))  
  
#analysisdata <- analysisdata %>% mutate(compositeoutcomegoodsleep = factor(compositescore, label = c("score 0 - worst sleep", "score 1", "score 2", "score 3", "score 4 - best sleep"))) %>%  
# filter(!is.na(compositescore))  
  
  
 analysisdata <- analysisdata %>% mutate(compositeoutcomegoodsleep = case\_when(  
 compositescore >= 2 ~ 1,  
 compositescore < 2 ~ 0,  
 is.na(compositescore) ~ NA\_real\_)) %>%   
 mutate(compositeoutcomegoodsleep = factor(compositeoutcomegoodsleep, label = c("Poor sleep (score less than 2)", "Good sleep (score 2 or more)"))) %>% filter(!is.na(compositescore))  
  
#Logistic regression just input demographic variables, then add pyschosocial variables and see how that affects model statistics. Sequential adjustment.  
  
#Cut it in different places.   
#Split between 2 and 3 , and 3 and 4   
  
#Cumulative score how many ones do you get   
#hours of sleep (7-9) vs. outside of (7-9) --> either interim category   
#quality of sleep (1) sometimes or (0)  
#consistent wakeup (1) sometimes/no (0)

analysisdata <- analysisdata %>% mutate(compositeoutcomegoodsleepbinary = case\_when(  
 compositescore >= 2 ~ 1,  
 compositescore < 2 ~ 0,  
 is.na(compositescore) ~ NA\_real\_))  
  
#consider less than 0.1  
#program  
#emotions, social media, exercise,   
#Trying  
analysisdata <- analysisdata %>% mutate(Q4\_gender\_binary = case\_when(  
 Q4\_gender == "Male" ~ 1,  
 Q4\_gender == "Female" ~ 0,  
 TRUE ~ NA\_real\_  
)) %>%   
 mutate(Q2\_program\_reduced = case\_when(  
 Q2\_program == "Masters Student" ~ 0,  
 Q2\_program == "Post doctoral student" ~ 1,  
 TRUE ~ NA\_real\_  
 )) %>%  
mutate(  
 Q4\_gender\_binary = factor(Q4\_gender\_binary, labels = c("Female", "Male")),  
 Q2\_program\_reduced = factor(Q2\_program\_reduced, labels = c("Masters", "Postdoc"))  
)  
  
#m1  
m1 <- glm(compositeoutcomegoodsleepbinary ~ Q4\_gender\_binary,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m1)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.39

1.02 – 1.92

0.039

Q4\_gender\_binary [Male]

0.54

0.25 – 1.12

0.101

Observations

193

R2 Tjur

0.014

#m2  
m2 <- glm(compositeoutcomegoodsleepbinary ~ Q2\_program\_reduced,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m2)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.05

0.75 – 1.47

0.796

Q2\_program\_reduced[Postdoc]

0.24

0.01 – 1.67

0.206

Observations

140

R2 Tjur

0.013

#m3  
m3 <- glm(compositeoutcomegoodsleepbinary ~ Q3\_role,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m3)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.67

0.09 – 4.02

0.657

What is your role atBloomberg: Full-timestudent

1.76

0.28 – 13.69

0.542

What is your role atBloomberg: Part-timestudent

1.86

0.29 – 14.96

0.514

Observations

198

R2 Tjur

0.002

#m4  
m4 <- glm(compositeoutcomegoodsleepbinary ~ Q5\_age,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m4)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.81

0.51 – 6.55

0.360

How old are you?

0.99

0.95 – 1.03

0.517

Observations

196

R2 Tjur

0.002

#m5  
m5 <- glm(compositeoutcomegoodsleepbinary ~ Q6\_numberinhousehold,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m5)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.64

0.32 – 1.25

0.200

How many people live inyour household, includingyourself?

1.28

1.01 – 1.65

0.047

Observations

196

R2 Tjur

0.021

#m6  
m6 <- glm(compositeoutcomegoodsleepbinary ~ Q37\_employed,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m6)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.98

0.65 – 1.47

0.917

Are you currentlyemployed outside of youreducation program?: Yes

1.45

0.83 – 2.55

0.197

Observations

197

R2 Tjur

0.008

#m7  
m7 <- glm(compositeoutcomegoodsleepbinary ~ Q38\_wfh,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m7)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.14

0.56 – 2.37

0.715

Do you work from home?:Yes

1.36

0.57 – 3.21

0.484

Observations

104

R2 Tjur

0.005

#m8   
m8 <- glm(compositeoutcomegoodsleepbinary ~ Q7\_children,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m8)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.15

0.85 – 1.56

0.358

Q7\_children [Yes, atleast one child age 5 orolder]

1.39

0.45 – 4.76

0.578

Q7\_children [Yes, atleast one child under theage of 5]

0.99

0.34 – 2.95

0.988

Observations

198

R2 Tjur

0.002

#m9  
m9 <- glm(compositeoutcomegoodsleepbinary ~ Q8\_diagnosis,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m9)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.71

0.21 – 2.24

0.566

Have you ever beendiagnosed with any of thefollowing sleepdisorders?: No

1.69

0.52 – 5.91

0.383

Have you ever beendiagnosed with any of thefollowing sleepdisorders?: Other

2.80

0.21 – 70.84

0.448

Have you ever beendiagnosed with any of thefollowing sleepdisorders?: Sleep Apnea

1.40

0.13 – 15.29

0.772

Observations

198

R2 Tjur

0.005

#m10  
m10 <- glm(compositeoutcomegoodsleepbinary ~ Q10\_workdayhoursofsleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m10)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.00

0.00 – 0.00

<0.001

During the past 5workdays, how many hoursof sleep did you get pernight on average?

3.40

2.33 – 5.24

<0.001

Observations

198

R2 Tjur

0.278

#m10  
m11 <- glm(compositeoutcomegoodsleepbinary ~ Q11\_weekendhoursofsleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m11)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.09

0.01 – 0.67

0.021

During the past weekend,how many hours of sleepdid you get per night onaverage?

1.39

1.08 – 1.80

0.012

Observations

195

R2 Tjur

0.036

#m12  
m12 <- glm(compositeoutcomegoodsleepbinary ~ Q13\_consistentwakeup,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m12)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.25

0.11 – 0.50

<0.001

Do you have a consistenttime you wake up onweekdays?: Sometimes

1.83

0.66 – 5.20

0.245

Do you have a consistenttime you wake up onweekdays?: Yes

11.23

5.04 – 27.31

<0.001

Observations

198

R2 Tjur

0.235

#m13  
m13 <- glm(compositeoutcomegoodsleepbinary ~ Q15\_consistentbedtimeonweekdays,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m13)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.37

0.23 – 0.59

<0.001

Do you have a consistenttime you wake up onweekdays?: Sometimes

5.22

2.46 – 11.53

<0.001

Do you have a consistenttime you wake up onweekdays?: Yes

10.99

5.21 – 24.60

<0.001

Observations

198

R2 Tjur

0.232

#m14  
m14 <- glm(compositeoutcomegoodsleepbinary ~ Q49\_sleepqualitychangecovid,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m14)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.69

1.05 – 2.78

0.033

Has your sleep qualitychanged due to theCOVID-19 pandemic? : Yes,I feel my sleep qualityhas improved

3.25

1.10 – 12.03

0.048

Has your sleep qualitychanged due to theCOVID-19 pandemic? : Yes,I feel my sleep qualityhas worsened

0.39

0.21 – 0.73

0.004

Observations

196

R2 Tjur

0.102

#m15  
m15 <- glm(compositeoutcomegoodsleepbinary ~ Q18\_howoftenpracticemindfullness,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m15)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.75

0.87 – 3.67

0.122

How often do you practicemindfulness techniques?(i.e. breathingexercises, meditation,etc.,): Rarely

0.50

0.21 – 1.15

0.106

How often do you practicemindfulness techniques?(i.e. breathingexercises, meditation,etc.,): Sometimes

0.72

0.30 – 1.67

0.448

How often do you practicemindfulness techniques?(i.e. breathingexercises, meditation,etc.,): Always

1.71

0.19 – 36.82

0.656

Observations

180

R2 Tjur

0.020

#m16  
m16 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_1\_thingsidointhelasthourbeforesleepaffectthequalityofmysleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m16)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.00

0.19 – 5.40

1.000

The things I do in thelast hour before bedaffect the quality of mysleep.: Somewhat disagree

1.60

0.22 – 12.07

0.637

The things I do in thelast hour before bedaffect the quality of mysleep.: Neither agree nordisagree

0.80

0.12 – 5.39

0.813

The things I do in thelast hour before bedaffect the quality of mysleep.: Somewhat agree

1.24

0.22 – 6.99

0.800

The things I do in thelast hour before bedaffect the quality of mysleep.: Strongly agree

1.16

0.20 – 6.67

0.861

Observations

198

R2 Tjur

0.005

#m17  
m17 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_3\_mostofmyfriendshaveahealthysleeproutine,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m17)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.50

0.11 – 1.90

0.327

Most of my friends have ahealthy sleep routine.:Somewhat disagree

1.81

0.42 – 9.53

0.444

Most of my friends have ahealthy sleep routine.:Neither agree nordisagree

3.43

0.85 – 17.06

0.095

Most of my friends have ahealthy sleep routine.:Somewhat agree

1.82

0.42 – 9.53

0.438

Most of my friends have ahealthy sleep routine.:Strongly agree

1.67

0.27 – 11.38

0.583

Observations

197

R2 Tjur

0.033

#m18  
m18 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_4\_lackofsleepaffectsmyacademicperformance,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m18)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

2.00

0.19 – 43.04

0.571

Lack of sleep affects myacademic performance.:Somewhat disagree

0.88

0.03 – 12.39

0.923

Lack of sleep affects myacademic performance.:Neither agree nordisagree

0.50

0.02 – 6.45

0.604

Lack of sleep affects myacademic performance.:Somewhat agree

0.53

0.02 – 5.70

0.605

Lack of sleep affects myacademic performance.:Strongly agree

0.64

0.03 – 6.93

0.721

Observations

197

R2 Tjur

0.006

#m19  
m19 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_7\_ithinkcuttingoutscreenuseonehourbeforesleepleadstobettersleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m19)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.75

0.15 – 3.40

0.706

I think cutting outscreen use 1 hour beforebed leads to bettersleep.: Somewhat disagree

2.67

0.29 – 31.00

0.396

I think cutting outscreen use 1 hour beforebed leads to bettersleep.: Neither agree nordisagree

1.40

0.27 – 7.92

0.682

I think cutting outscreen use 1 hour beforebed leads to bettersleep.: Somewhat agree

1.66

0.34 – 8.86

0.525

I think cutting outscreen use 1 hour beforebed leads to bettersleep.: Strongly agree

1.56

0.32 – 8.48

0.579

Observations

198

R2 Tjur

0.005

#m20  
m20 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_8\_ithinkingworkingoutregularlyleadstobettersleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m20)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.50

0.02 – 5.22

0.571

I think working outregularly leads to bettersleep.: Neither agree nordisagree

2.25

0.18 – 54.04

0.538

I think working outregularly leads to bettersleep.: Somewhat agree

1.93

0.18 – 42.94

0.599

I think working outregularly leads to bettersleep.: Strongly agree

2.65

0.25 – 58.02

0.431

Observations

198

R2 Tjur

0.008

#m21  
m21 <- glm(compositeoutcomegoodsleepbinary ~ Q44\_9\_ithinkmeditatingbeforesleephelpsquality,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m21)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.50

0.07 – 2.56

0.423

I think meditating beforebed helps sleep quality.:Somewhat disagree

2.40

0.32 – 23.23

0.407

I think meditating beforebed helps sleep quality.:Neither agree nordisagree

2.40

0.44 – 18.18

0.331

I think meditating beforebed helps sleep quality.:Somewhat agree

2.48

0.45 – 18.83

0.313

I think meditating beforebed helps sleep quality.:Strongly agree

2.26

0.40 – 17.41

0.371

Observations

197

R2 Tjur

0.006

#m22  
m22 <- glm(compositeoutcomegoodsleepbinary ~ Q59\_1\_icanmaintainhealthysleephabits,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m22)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.17

0.03 – 0.61

0.019

I can maintain healthysleep habits.: Slightlyconfident

1.64

0.32 – 12.36

0.581

I can maintain healthysleep habits.: Somewhatconfident

5.14

1.27 – 34.76

0.041

I can maintain healthysleep habits.: Prettyconfident

14.70

3.60 – 100.16

0.001

I can maintain healthysleep habits.: Extremelyconfident

120.00

14.21 – 2959.56

<0.001

Observations

197

R2 Tjur

0.228

#m23  
m23 <- glm(compositeoutcomegoodsleepbinary ~ Q59\_2\_icancutoutscreenuseonehourbeforesleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m23)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.32

0.73 – 2.42

0.367

I can cut out screen use1 hour before bed.:Slightly confident

0.48

0.22 – 1.05

0.067

I can cut out screen use1 hour before bed.:Somewhat confident

1.35

0.59 – 3.12

0.477

I can cut out screen use1 hour before bed.:Pretty confident

1.52

0.57 – 4.24

0.411

I can cut out screen use1 hour before bed.:Extremely confident

1.01

0.30 – 3.54

0.983

Observations

197

R2 Tjur

0.050

#m24  
m24 <- glm(compositeoutcomegoodsleepbinary ~ Q59\_3\_icanworkoutregularly,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m24)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.25

0.06 – 0.79

0.032

I can work outregularly.: Slightlyconfident

4.71

1.25 – 23.23

0.033

I can work outregularly.: Somewhatconfident

6.13

1.63 – 30.36

0.012

I can work outregularly.: Prettyconfident

3.84

1.06 – 18.40

0.057

I can work outregularly.: Extremelyconfident

7.40

2.07 – 35.34

0.004

Observations

196

R2 Tjur

0.055

#m25  
m25 <- glm(compositeoutcomegoodsleepbinary ~ Q59\_4\_icanmediatebeforebed,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m25)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.44

0.80 – 2.68

0.230

I can meditate beforebed.: Slightly confident

0.62

0.27 – 1.38

0.243

I can meditate beforebed.: Somewhat confident

0.75

0.33 – 1.66

0.474

I can meditate beforebed.: Pretty confident

1.26

0.49 – 3.31

0.635

I can meditate beforebed.: Extremely confident

0.78

0.25 – 2.44

0.664

Observations

197

R2 Tjur

0.015

#m26  
m26 <- glm(compositeoutcomegoodsleepbinary ~ Q19\_howmanyhourssdidyouuseascreen,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m26)

## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred  
  
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## Warning: glm.fit: algorithm did not converge

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compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

2.00

0.19 – 43.04

0.571

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen4

0.75

0.02 – 15.10

0.851

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen5

0.33

0.01 – 6.15

0.472

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen6

0.63

0.02 – 9.16

0.736

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen7

0.33

0.01 – 6.15

0.472

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen8

0.37

0.02 – 4.30

0.436

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen9

1.17

0.04 – 17.88

0.913

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen10

0.75

0.03 – 8.29

0.819

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen11

0.00

NA – 2278748803526939133652078803969129957923208822784.00

0.987

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen12

0.73

0.03 – 8.07

0.798

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen13

0.50

0.01 – 10.86

0.661

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen14

0.43

0.02 – 5.61

0.529

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen15

0.13

0.00 – 2.62

0.210

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen16

1.00

0.02 – 40.40

1.000

How many hours per day doyou typically use ascreen? (i.e. cell phone,tablet, computer,television):Q19\_howmanyhourssdidyouuseascreen17

2878906.43

0.00 – NA

0.992

Observations

195

R2 Tjur

0.056

#m27  
m27 <- glm(compositeoutcomegoodsleepbinary ~ Q12\_1\_howmanynightsusescreen,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m27)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.76

0.48 – 7.10

0.406

In the past week, howmany nights did you usescreens (i.e. cell phone,tablet, computer,television) within 1 hourbefore bed?

0.94

0.76 – 1.15

0.544

Observations

198

R2 Tjur

0.002

#m28  
m28 <- glm(compositeoutcomegoodsleepbinary ~ Q17\_stressedaboutschool,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m28)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

2.23

0.92 – 5.67

0.082

How stressed do youcurrently feel aboutschool?

0.91

0.79 – 1.03

0.143

Observations

196

R2 Tjur

0.011

#m29  
m29 <- glm(compositeoutcomegoodsleepbinary ~ Q33\_whatisthrecommendednumbersofhoursofsleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m29)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

21.46

0.74 – 746.38

0.080

Q33\_whatisthrecommendednumbersofhoursofsleep

0.69

0.43 – 1.07

0.105

Observations

168

R2 Tjur

0.016

#m30  
m30 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_1\_energyfordailyacitivites,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m30)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.30

0.04 – 2.24

0.246

Energy for dailyactivities

1.35

0.88 – 2.11

0.180

Observations

197

R2 Tjur

0.009

#m31  
m31 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_2\_attractivness,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m31)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.88

0.85 – 4.25

0.123

Attractiveness (to self &others)

0.87

0.68 – 1.09

0.231

Observations

197

R2 Tjur

0.007

#m32  
m32 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_3\_productivity,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m32)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.84

0.09 – 7.88

0.874

Productivity atwork/school

1.08

0.67 – 1.73

0.754

Observations

197

R2 Tjur

0.001

#m33  
m33 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_4\_accomplishmentofotherdailygoals,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m33)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.37

0.32 – 6.06

0.674

Accomplishment of otherdaily goals (e.g.exercise, cooking, payingbills, etc)

0.97

0.69 – 1.35

0.848

Observations

197

R2 Tjur

0.000

#m34  
m34 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_5\_mentalandemotionalwellbeing,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m34)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.34

0.03 – 3.21

0.350

Mental and emotionalwellbeing

1.31

0.81 – 2.17

0.270

Observations

196

R2 Tjur

0.006

#m35  
m35 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_6\_fosteringmaintaingrelationships,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m35)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.27

0.42 – 3.94

0.674

Fostering/maintainingrelationships

0.99

0.75 – 1.30

0.919

Observations

196

R2 Tjur

0.000

#m36  
m36 <- glm(compositeoutcomegoodsleepbinary ~ Q50\_7\_caringforchildren,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m36)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.10

0.68 – 1.78

0.703

Caring for children

1.04

0.87 – 1.24

0.707

Observations

190

R2 Tjur

0.001

#m37  
m37 <- glm(compositeoutcomegoodsleepbinary ~ Q53\_1\_getoutsidefor10mininthemorning,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m37)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.06

0.50 – 2.28

0.878

Get outside for 10minutes in the morning.

1.03

0.84 – 1.27

0.753

Observations

197

R2 Tjur

0.001

#m38  
m38 <- glm(compositeoutcomegoodsleepbinary ~ Q53\_2\_exerciseduringtheday,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m38)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.39

0.13 – 1.08

0.074

Exercise during the day.

1.33

1.04 – 1.74

0.028

Observations

195

R2 Tjur

0.025

#m39  
m39 <- glm(compositeoutcomegoodsleepbinary ~ Q53\_3\_doingabreathingexercisebeforesleep,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m39)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.92

0.43 – 1.96

0.834

Do a breathing exercisebefore you sleep.

1.08

0.87 – 1.35

0.478

Observations

197

R2 Tjur

0.003

#m40  
m40 <- glm(compositeoutcomegoodsleepbinary ~ Q53\_4\_notusescreens,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m40)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.72

0.36 – 1.43

0.352

Not use screens (i.e.cell phone, tablet,computer, television) for1 hour before bed

1.23

0.95 – 1.59

0.119

Observations

197

R2 Tjur

0.013

#m41  
m41 <- glm(compositeoutcomegoodsleepbinary ~ Q53\_5\_listeningtoacalmingaudiobookorpodcast,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m41)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.12

0.59 – 2.11

0.733

Listen to a calmingaudiobook or podcastbefore bed

1.02

0.84 – 1.25

0.829

Observations

197

R2 Tjur

0.000

#m42  
m42 <- glm(compositeoutcomegoodsleepbinary ~ Brushing.teeth,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m42)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.56

0.24 – 1.25

0.167

Brushing.teeth

2.32

0.99 – 5.76

0.058

Observations

198

R2 Tjur

0.019

#m43  
m43 <- glm(compositeoutcomegoodsleepbinary ~ Watching.TV,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m43)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.06

0.76 – 1.46

0.741

Watching.TV

1.51

0.80 – 2.92

0.208

Observations

198

R2 Tjur

0.008

#m44  
m44 <- glm(compositeoutcomegoodsleepbinary ~ Phone.Usage,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m44)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.31

0.79 – 2.20

0.303

Phone.Usage

0.86

0.46 – 1.58

0.625

Observations

198

R2 Tjur

0.001

#m45  
m45 <- glm(compositeoutcomegoodsleepbinary ~ Listening.to.Music,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m45)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.22

0.90 – 1.64

0.199

Listening.to.Music

0.75

0.31 – 1.81

0.526

Observations

198

R2 Tjur

0.002

#m46  
m46 <- glm(compositeoutcomegoodsleepbinary ~ Washing.my.face,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m46)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

0.95

0.62 – 1.47

0.825

Washing.my.face

1.44

0.81 – 2.54

0.212

Observations

198

R2 Tjur

0.008

#m47  
m47 <- glm(compositeoutcomegoodsleepbinary ~ Showering,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m47)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.49

1.07 – 2.10

0.020

Showering

0.43

0.23 – 0.81

0.010

Observations

198

R2 Tjur

0.035

#m48  
m48 <- glm(compositeoutcomegoodsleepbinary ~ Journaling,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m48)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.16

0.87 – 1.54

0.310

Journaling

1.44

0.34 – 7.17

0.626

Observations

198

R2 Tjur

0.001

#m49  
m49 <- glm(compositeoutcomegoodsleepbinary ~ Reading,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m49)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.02

0.71 – 1.45

0.928

Reading

1.46

0.82 – 2.62

0.200

Observations

198

R2 Tjur

0.008

#m50  
m50 <- glm(compositeoutcomegoodsleepbinary ~ Meditating,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m50)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.11

0.83 – 1.49

0.461

Meditating

2.24

0.72 – 8.41

0.185

Observations

198

R2 Tjur

0.009

#m51  
m51 <- glm(compositeoutcomegoodsleepbinary ~ bedtimeroutine,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m51)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.10

0.67 – 1.81

0.706

bedtimeroutinePhone usage

0.73

0.17 – 2.99

0.657

bedtimeroutineReading

0.23

0.01 – 1.64

0.196

bedtimeroutineShowering

0.91

0.03 – 23.67

0.947

bedtimeroutineWashing my face

1.24

0.67 – 2.31

0.489

bedtimeroutineWatching TV

0.91

0.03 – 23.67

0.947

Observations

197

R2 Tjur

0.017

#m52  
m52 <- glm(compositeoutcomegoodsleepbinary ~ cantsleepfeeling,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m52)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

2.67

0.77 – 12.17

0.147

cantsleepfeelingFrustrated

0.54

0.11 – 1.99

0.383

cantsleepfeelingGuilty

0.18

0.03 – 0.75

0.026

cantsleepfeelingNone of the above

0.44

0.07 – 2.34

0.345

cantsleepfeelingOther

0.38

0.05 – 2.22

0.290

cantsleepfeelingSad

0.08

0.00 – 0.71

0.044

cantsleepfeelingStressed

0.75

0.14 – 3.45

0.720

Observations

198

R2 Tjur

0.070

#m53  
m53 <- glm(compositeoutcomegoodsleepbinary ~ behaviors,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m53)

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compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

1.64

1.09 – 2.50

0.019

behaviorsCigarette smoking

0.20

0.01 – 1.66

0.175

behaviorsDaytime napping

1292448.80

0.00 – NA

0.987

behaviorsDrinking Caffeinated beverages

0.61

0.07 – 5.27

0.629

behaviorsExercise

0.67

0.35 – 1.26

0.211

behaviorsSocial Media Use

0.29

0.11 – 0.71

0.009

Observations

196

R2 Tjur

0.049

#m54  
m54 <- glm(compositeoutcomegoodsleepbinary ~ information,family = binomial(link = "logit"), data = analysisdata)  
tab\_model(m54)

compositeoutcomegoodsleepbinary

Predictors

Odds Ratios

CI

p

(Intercept)

7.00

1.25 – 130.85

0.069

informationHealth care professional

0.13

0.01 – 0.77

0.060

informationNews sources

0.29

0.01 – 2.54

0.309

informationOther online source

0.14

0.01 – 0.98

0.089

informationSocial media

0.25

0.01 – 1.55

0.210

informationUniversity wellbeing resources

0.06

0.00 – 0.46

0.019

Observations

183

R2 Tjur

0.063

#  
mylogit <- glm(compositeoutcomegoodsleepbinary ~ cantsleepfeeling + behaviors + Q4\_gender + Q5\_age, data = analysisdata)  
tab\_model(mylogit)

compositeoutcomegoodsleepbinary

Predictors

Estimates

CI

p

(Intercept)

0.97

0.55 – 1.39

<0.001

cantsleepfeelingFrustrated

-0.19

-0.50 – 0.13

0.241

cantsleepfeelingGuilty

-0.46

-0.80 – -0.12

0.008

cantsleepfeelingNone of the above

-0.13

-0.53 – 0.27

0.527

cantsleepfeelingOther

-0.23

-0.65 – 0.20

0.297

cantsleepfeelingSad

-0.51

-1.01 – -0.01

0.049

cantsleepfeelingStressed

0.01

-0.35 – 0.37

0.958

behaviorsCigarette smoking

-0.24

-0.76 – 0.27

0.356

behaviorsDaytime napping

0.33

-0.61 – 1.27

0.490

behaviorsDrinking Caffeinated beverages

-0.10

-0.59 – 0.38

0.678

behaviorsExercise

-0.08

-0.24 – 0.07

0.296

behaviorsSocial Media Use

-0.29

-0.51 – -0.08

0.009

What gender do youidentify as?: Male

-0.17

-0.35 – 0.02

0.076

What gender do youidentify as?: Non-binary/ third gender

-0.39

-0.98 – 0.20

0.196

How old are you?

-0.00

-0.01 – 0.01

0.490

Observations

194

R2 Nagelkerke

0.176

attach(analysisdata)  
 analysisdata <- analysisdata %>% mutate(compositeoutcomegoodsleepbinary\_badsleep = case\_when(  
 compositescore >= 2 ~ 0,  
 compositescore < 2 ~ 1,  
 is.na(compositescore) ~ NA\_real\_))  
  
analysisdata <- analysisdata %>%   
 mutate(Confidence = case\_when(  
 Q59\_1\_icanmaintainhealthysleephabits == "Extremely confident" ~ 1,  
 Q59\_1\_icanmaintainhealthysleephabits == "Pretty confident" ~ 1,  
 is.na(Q59\_1\_icanmaintainhealthysleephabits) ~ NA\_real\_,  
 TRUE ~ 0  
 )) %>%  
 mutate(Workoutregularly = case\_when(  
 Q59\_3\_icanworkoutregularly == "Extremely confident" ~ 1,  
 Q59\_3\_icanworkoutregularly == "Pretty confident" ~ 1,  
 is.na(Q59\_3\_icanworkoutregularly) ~ NA\_real\_,  
 TRUE ~ 0  
 ))  
  
  
  
mylogit <- glm(compositeoutcomegoodsleepbinary\_badsleep ~ Q4\_gender\_binary + Q6\_numberinhousehold + Q11\_weekendhoursofsleep + Confidence + Workoutregularly + Showering + Guilty + Sad + Social.Media.Use, family = binomial(link = "logit"), data = analysisdata)  
tab\_model(mylogit)

compositeoutcomegoodsleepbinary\_badsleep

Predictors

Odds Ratios

CI

p

(Intercept)

157.41

9.12 – 3510.12

0.001

Q4\_gender\_binary: Male

2.66

1.02 – 7.18

0.048

How many people live inyour household, includingyourself?

0.73

0.53 – 0.98

0.041

During the past weekend,how many hours of sleepdid you get per night onaverage?

0.64

0.46 – 0.87

0.006

Confidence

0.16

0.07 – 0.33

<0.001

Workoutregularly

0.82

0.39 – 1.72

0.607

Showering

3.31

1.44 – 7.92

0.006

Guilty

3.03

1.10 – 8.89

0.036

Sad

0.96

0.33 – 2.68

0.933

Social.Media.Use

0.36

0.13 – 0.97

0.046

Observations

187

R2 Tjur

0.304