

SHUTi CARE Descriptives

Kelly Shaffer

3/19/23

##Environment set-up

```
setwd("Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/Data & Analyses/Quantitative Data")
getwd()
```

```
#install.packages('tidyverse')
#install.packages('Hmisc')
#install.packages('car')
#install.packages('ltm')
```

```
library(Hmisc)
library(car)
library(ltm)
library(tidyverse)
```

##Data import & management Baseline

```
#Import data for continuous variables
baseline.number<-read.csv("SHUTi-CARE_Baseline_Final numeric_2023 01 18_deid.csv")
baseline.number<-as.data.frame(baseline.number)
```

```
#Rename continuous variables
baseline.number<-baseline.number %>%
rename('QDuration (in seconds)' = 'Duration..in.seconds.',
QRecordedDate=RecordedDate,
QResponseId=ResponseId,
age=Q1.1,
total_CR=Q160,
CR_age=Q191,
care_duration_y=Q1.14_1,
care_duration_m=Q1.14_2,
overload1=Q3.1_1,
overload2=Q3.1_2,
overload3=Q3.1_3,
overload4=Q3.1_4,
cgefficacy1=Q3.2_1,
cgefficacy2=Q3.2_2,
cgefficacy3=Q3.3_1,
cgefficacy4=Q3.3_2,
guilt_selfcare1=Q164_1,
guilt_dowrong1=Q164_2,
```

```
guilt_notrise1=Q164_3,  
guilt_notrise2=Q164_4,  
guilt_selfcare2=Q164_5,  
guilt_dowrong2=Q164_6,  
guilt_notrise3=Q164_7,  
guilt_dowrong3=Q164_8,  
guilt_dowrong4=Q164_9,  
guilt_dowrong5=Q164_10,  
guilt_notrise4=Q164_11,  
guilt_dowrong6=Q164_12,  
guilt_selfcare3=Q164_13,  
guilt_selfcare4=Q164_14,  
guilt_dowrong7=Q164_15,  
guilt_notrise5=Q164_16,  
guilt_notrise6=Q164_17,  
adl_bowels=Q175,  
adl_bladder=Q176,  
adl_grooming=Q177,  
adl_toilet=Q178,  
adl_feeding=Q179,  
adl_transfer=Q180,  
adl_mobility=Q181,  
adl_dressing=Q182.1,  
adl_stairs=Q183,  
adl_bathing=Q184.2,  
pss_cognitive1=Q166_1,  
pss_cognitive2=Q166_2,  
pss_cognitive3=Q166_3,  
pss_cognitive4=Q166_4,  
pss_cognitive5=Q166_5,  
pss_cognitive6=Q166_6,  
pss_cognitive7=Q166_7,  
pss_cognitive8=Q166_8,  
pss_behavior1=Q167_1,  
pss_behavior2=Q167_2,  
pss_behavior3=Q167_3,  
pss_behavior4=Q167_4,  
pss_behavior5=Q167_5,  
pss_behavior6=Q167_6,  
pss_behavior7=Q167_7,  
pss_behavior8=Q167_8,  
pss_behavior9=Q167_9,  
pss_behavior10=Q167_10,  
pss_behavior11=Q167_11,  
pss_behavior12=Q167_12,  
pss_behavior13=Q167_13,  
pss_behavior14=Q167_14,  
adl_tasks=Q170,  
iadl_tasks=Q172,  
med_nursing_tasks=Q174,  
isi_2=Q5.6,  
isi_3=Q5.7,  
dbas_1=Q5.11,
```

```

dbas_2=Q5.12,
dbas_3=Q5.13,
dbas_4=Q5.14,
dbas_5=Q5.15,
dbas_6=Q5.16,
dbas_7=Q5.17,
dbas_8=Q5.18,
dbas_9=Q5.19,
dbas_10=Q5.20,
dbas_11=Q5.21,
dbas_12=Q5.22,
dbas_13=Q5.23,
dbas_14=Q5.24,
dbas_15=Q5.25,
dbas_16=Q5.26,
sloc1=Q5.29_1,
sloc2=Q5.29_2,
sloc3=Q5.29_3,
sloc4=Q5.29_4,
sloc5=Q5.29_5,
sloc6=Q5.29_6,
sloc7=Q5.29_7,
sloc8=Q5.29_8,
sleep_diff_precg=Q193,
sleep_diff_bc_cg=Q194,
promis_physhealth1=Q185,
promis_physhealth2=Q186,
phq4_1=Q189_1,
phq4_2=Q189_2,
phq4_3=Q189_3,
phq4_4=Q189_4,
complete=Q195)

##Import data for ordinal variables
baseline.ordinal<-read.csv("SHUTi-CARE_Baseline_Final text_2023 01 18_deid.csv")
baseline.ordinal<-as.data.frame(baseline.ordinal)

##Rename ordinal variables
baseline.ordinal<-baseline.ordinal %>%
rename(gender=Q1.2,
gender_other=Q1.2_3_TEXT,
sex=Q190,
race=Q182,
race_other=Q182_6_TEXT,
ethnicity=Q184,
work=Q1.4,
work_other=Q1.4_9_TEXT,
income=Q1.5,
education=Q184.1,
income_perceived=Q1.6,
health_literacy=Q1.8,
CR_relationship=Q1.10,
CR_relationship_other=Q1.10_14_TEXT,

```

```

CR_live=Q1.11,
CR_same_room=Q1.12,
CR_other_live=Q163,
CR_other_live_other=Q163_9_TEXT,
CR_condition=Q1.13,
Quuid=uuid)

#Merge datasets
baseline.number<-baseline.number %>%
  dplyr::select(-starts_with("Q"))
baseline.ordinal<-baseline.ordinal %>%
  dplyr::select(-starts_with("Q"))

baseline<- merge(baseline.ordinal, baseline.number, by.x = "PID", by.y = "PID", all = TRUE)
rm(baseline.number, baseline.ordinal)

```

Post-A User

```

#Import data for continuous variables
postuser.number<-read.csv("SHUTi-CARE_Post (User)_Final numeric_2023 03 08_deid.csv")
postuser.number<-as.data.frame(postuser.number)

#Rename continuous variables
postuser.number<-postuser.number %>%
  rename('QDuration (in seconds)'='Duration..in.seconds.',
  QRecordedDate=RecordedDate,
  QResponseId=ResponseId,
  isi1=Q5.6,
  isi2=Q5.7,
  dbas1=Q5.11,
  dbas2=Q5.12,
  dbas3=Q5.13,
  dbas4=Q5.14,
  dbas5=Q5.15,
  dbas6=Q5.16,
  dbas7=Q5.17,
  dbas8=Q5.18,
  dbas9=Q5.19,
  dbas10=Q5.20,
  dbas11=Q5.21,
  dbas12=Q5.22,
  dbas13=Q5.23,
  dbas14=Q5.24,
  dbas15=Q5.25,
  dbas16=Q5.26,
  sloc1=Q5.29_1,
  sloc2=Q5.29_2,
  sloc3=Q5.29_3,
  sloc4=Q5.29_4,
  sloc5=Q5.29_5,
  sloc6=Q5.29_6,
  sloc7=Q5.29_7,
  sloc8=Q5.29_8,

```

```

overload1=Q3.1_1,
overload2=Q3.1_2,
overload3=Q3.1_3,
overload4=Q3.1_4,
promis.ph1=Q296,
promis.ph2=Q297,
phq1=Q299_1,
phq2=Q299_2,
phq3=Q299_3,
phq4=Q299_4)

##Import data for ordinal variables
postuser.ordinal<-read.csv("SHUTi-CARE_Post (User)_Final text_2023 03 08_deid.csv")
postuser.ordinal<-as.data.frame(postuser.ordinal)

##Rename ordinal variables
postuser.ordinal<-postuser.ordinal %>%
  rename(eval.needs=QID187,
eval.needs.how=Q191,
eval.needs.different=Q193,
eval.recommend=Q195,
eval.recommend.different=Q197,
eval.recommend.why=Q199,
eval.satisfiedCSQ=Q201,
eval.satisfied.why=Q203,
eval.satisfied.different=Q205,
eval.again=Q207,
eval.again.different=Q209,
eval.again.why=Q211,
eval.cg_responsibilities=Q215,
eval.cg_help=Q217,
eval.cg_format=Q219,
eval.cg_changes=Q221,
eval.tailor=Q223,
eval.convenience=Q229,
eval.satisfiedIIUQ=QID212,
eval.accept=QID213,
eval.useful=QID214,
eval.helpful=QID223,
eval.website_work_you=QID225,
eval.follow=QID231,
eval.improve_sleep=Q301,
eval.improve_cg=Q317,
adherence.forgot=Q331,
adherence.preferred_not=Q333,
adherence.no_time=Q335,
adherence.cg_issues=Q347,
adherence.too_much=Q361,
adherence.too_long=Q363,
adherence.website_wont_help=Q365,
adherence.rules=Q369,
adherence.spouse=Q371,
adherence.cr=Q293,

```

```

adherence.sleep_restrict=Q373,
adherence.hw_amount=Q377,
adherence.hw_difficult=Q379,
adherence.personal_email=Q383,
adherence.phone=Q385,
adherence.supportcall=Q387,
adherence.forum=Q318,
cg_changes=Q294,
cg_changes1=Q295,
wearables=Q319,
wearables1=Q320,
futurecontact=Q304,
Qurl=url,
Quuid=uuid)

#Merge datasets
postuser.number<-postuser.number %>%
  dplyr::select(-starts_with("Q"))
postuser.ordinal<-postuser.ordinal %>%
  dplyr::select(-starts_with("Q"))

postuser<- merge(postuser.ordinal, postuser.number, by.x = "PID", by.y = "PID", all = TRUE)
rm(postuser.number, postuser.ordinal)

```

Post-A Non-user

```

#Import data for continuous variables
postnonuser.number<-read.csv("SHUTi-CARE_Post (No SHUTi)_Final numeric_2023 03 08_deid.csv")
postnonuser.number<-as.data.frame(postnonuser.number)

#Rename continuous variables
postnonuser.number<- postnonuser.number %>%
  rename('QDuration (in seconds)'='Duration..in.seconds.',
  QRecordedDate=RecordedDate,
  QResponseId=ResponseId,
  isi1=Q9,
  isi2=Q10,
  overload1=Q66_1,
  overload2=Q66_2,
  overload3=Q66_3,
  overload4=Q66_4,
  promis.ph1=Q61,
  promis.ph2=Q62,
  phq1=Q64_1,
  phq2=Q64_2,
  phq3=Q64_3,
  phq4=Q64_4)

##Import data for ordinal variables
postnonuser.ordinal<-read.csv("SHUTi-CARE_Post (No SHUTi)_Final text_2023 03 08_deid.csv")
postnonuser.ordinal<-as.data.frame(postnonuser.ordinal)

##Rename ordinal variables

```

```

postnonuser.ordinal<- postnonuser.ordinal %>%
  rename(barriers=Q18,
    barriers.other=Q18_8_TEXT,
    barriers.relevant=Q20,
    barriers.lifestyle=Q21,
    barriers.interest=Q22,
    barriers.complicated=Q23,
    barriers.time=Q24,
    barriers.unhelpful=Q25,
    barriers.no_need=Q26,
    cg_changes=Q67,
    cg_changes1=Q68,
    wearables=Q69,
    wearables1=Q72,
    futurecontact=Q65,
    Quuid=uuid)

#Merge datasets
postnonuser.number<-postnonuser.number %>%
  dplyr::select(-starts_with("Q"))
postnonuser.ordinal<-postnonuser.ordinal %>%
  dplyr::select(-starts_with("Q"))

postnonuser<- merge(postnonuser.ordinal, postnonuser.number, by.x = "PID", by.y = "PID", all = TRUE)
rm(postnonuser.number, postnonuser.ordinal)

```

Core completion and engagement data

```

#Compute number of Cores completed within 9-week Intervention period
uniqueIDs <- unique(baseline$PID)
dat_rawEvents <- read.csv("Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/
dat_rawEvents <- dat_rawEvents[which(dat_rawEvents$PID %in% uniqueIDs), ]
rawDat<- dat_rawEvents

intdat <- uniqueIDs
intdat <- as.data.frame(intdat)
names(intdat) <- "PID"

day0Marker <- "Event::Day0"
dat_rawEvents$day0data <- ifelse(str_detect(dat_rawEvents$Event.Type, day0Marker),1,0)
day0data <- dat_rawEvents[which(dat_rawEvents$day0data==1),]
day0data <- day0data[c(4,9)]
names(day0data) <- c("PID", "Day0Date")

rawDat <- left_join(rawDat, day0data, by = "PID")

PostMarker <- "Post Questionnaire transitioned to Available"
dat_rawEvents$postdaydata <- ifelse(str_detect(dat_rawEvents$Description, PostMarker),1,0)
postdaydata <- dat_rawEvents[which(dat_rawEvents$postdaydata==1),]
postdaydata <- postdaydata[c(4,9)]
names(postdaydata) <- c("PID", "PostAvailDate")

rawDat <- left_join(rawDat, postdaydata, by = "PID")

```

```

rawDat$PostIntended<- as_datetime(rawDat$Day0Date) + days(63)
rawDat$PostIntended<- ymd_hms(rawDat$PostIntended, tz = "UTC")

rawDat$utctime.created<-str_replace(rawDat$Created.At, "UTC", "")
rawDat$utctime.created<-ymd_hms(rawDat$utctime.created, tz = "UTC")

rawDat$utctime.day0<-str_replace(rawDat$Day0Date, "UTC", "")
rawDat$utctime.day0<-ymd_hms(rawDat$utctime.day0, tz = "UTC")

rawDat$postDay0<- ifelse(rawDat$utctime.created > rawDat$utctime.day0, "Yes", "No")

rawDat$utctime.postday<-str_replace(rawDat$PostAvailDate, "UTC", "")
rawDat$utctime.postday<-ymd_hms(rawDat$utctime.postday, tz = "UTC")

rawDat$prePostAvail<- ifelse(rawDat$utctime.created < rawDat$utctime.postday, "Yes", "No")
rawDat$prePostIntend<- ifelse(rawDat$utctime.created < rawDat$PostIntended, "Yes", "No")
rawDat$prePost<- coalesce(rawDat$prePostAvail, rawDat$prePostIntend)

rawDat$inWindow <- ifelse(rawDat$postDay0 == "Yes" & rawDat$prePost == "Yes",
                          "Retain", "Remove")
rawDat_reduced <- rawDat[which(rawDat$inWindow=="Retain"),]

completed <- "transitioned to Completed"
rawDat_reduced$CoresComp <- ifelse(str_detect(rawDat_reduced$Description, completed),
                                   "Yes", "No")
rawDat_reduced <- rawDat_reduced[which(rawDat_reduced$CoresComp=="Yes"),]

core <- "Activity: Core"
rawDat_reduced$Core <- ifelse(str_detect(rawDat_reduced$Description, core),
                              "Yes", "No")
rawDat_reduced <- rawDat_reduced[which(rawDat_reduced$Core=="Yes"),]

rawDat_corecomp<- aggregate(data = rawDat_reduced,
                           Description ~ PID,
                           function(Description) length(unique(Description)))

names(rawDat_corecomp) <- c("PID", "int_cores_comp")

#Compute total cores complete
rawDat$inWindowTot <- ifelse(rawDat$postDay0 == "Yes",
                             "Retain", "Remove")
rawDat_reduced <- rawDat[which(rawDat$inWindowTot=="Retain"),]

completed <- "transitioned to Completed"
rawDat_reduced$CoresComp <- ifelse(str_detect(rawDat_reduced$Description, completed),
                                   "Yes", "No")
rawDat_reduced <- rawDat_reduced[which(rawDat_reduced$CoresComp=="Yes"),]

```



```

core <- "Activity: Core"
rawDat_reduced$Core <- ifelse(str_detect(rawDat_reduced$Description, core),
                              "Yes", "No")
rawDat_reduced <- rawDat_reduced[which(rawDat_reduced$Core=="Yes"),]

rawDat_totcorecomp<- aggregate(data = rawDat_reduced,
                              Description ~ PID,
                              function(Description) length(unique(Description)))

names(rawDat_totcorecomp) <- c("PID", "tot_cores_comp")
coreDat<-merge(rawDat_corecomp, rawDat_totcorecomp, by = "PID", all = TRUE)

uniqueIDs<-as.data.frame(uniqueIDs)
names(uniqueIDs)<- "PID"
coreDat<- merge(x=uniqueIDs, y=coreDat, by.x = "PID", by.y = "PID", all.x = TRUE)
coreDat$int_cores_comp <- replace_na(coreDat$int_cores_comp, 0)
coreDat$tot_cores_comp <- replace_na(coreDat$tot_cores_comp, 0)

#Compute User variable
coreDat$user<- ifelse(coreDat$int_cores_comp > 0, "User", "Non-user")
coreDat$engagement<- ifelse(coreDat$user == "Non-user", "Non-user", ifelse(coreDat$int_cores_comp >= 4,

#Remove dropped participant
coreDat<- coreDat %>%
  filter(PID != 202)

#write.csv(coreDat, "Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/Data &
rm(rawDat, dat_rawEvents, day0data, intdat, uniqueIDs, postdaydata, rawDat_corecomp, rawDat_reduced, raw

```

Interest form data

```

#Import data for continuous variables
interest<-read.csv("Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/Data &
interest<-as.data.frame(interest)

```

Create full long dataset for cleaning

```

baselinern<-baseline
names(baselinern)<- paste(names(baselinern), "T1", sep=".")

postuserrn<-postuser
names(postuserrn)<- paste(names(postuserrn), "T2u", sep=".")

data<- merge(baselinern, postuserrn, by.x = "PID.T1", by.y = "PID.T2u", all = TRUE)

postnonuserrn<-postnonuser
names(postnonuserrn)<- paste(names(postnonuserrn), "T2n", sep=".")

data<- merge(data, postnonuserrn, by.x = "PID.T1", by.y = "PID.T2n", all = TRUE)

```

```

data<- merge(data, coreDat, by.x = "PID.T1", by.y = "PID", all = TRUE)

data<- merge(data, interest, by.x = "PID.T1", by.y = "PID", all.x = TRUE)

#Remove participant who dropped out after completing baseline questionnaire (i.e., never received access)
data<-data %>%
  filter(PID.T1 != 202)

#Remove participant who withdrew during the intervention period (i.e., did not have full 9-week intervention)
data<-data %>%
  filter(PID.T1 != 607)

rm(baseline, baselinern, coreDat, postnonuser, postnonuserrn, postuser, postuserrn, interest)

```

##Data cleaning Demographics

```

#Age
data$age.T1<-car::recode(data$age.T1,'4 = 18;
5 = 19;
6 = 20;
7 = 21;
8 = 22;
9 = 23;
10 = 24;
11 = 25;
12 = 26;
13 = 27;
14 = 28;
15 = 29;
16 = 30;
17 = 31;
18 = 32;
19 = 33;
20 = 34;
21 = 35;
22 = 36;
23 = 37;
24 = 38;
25 = 39;
26 = 40;
27 = 41;
28 = 42;
29 = 43;
30 = 44;
31 = 45;
32 = 46;
33 = 47;
34 = 48;
35 = 49;
36 = 50;
37 = 51;
38 = 52;
39 = 53;

```

```

40 = 54;
41 = 55;
42 = 56;
43 = 57;
44 = 58;
45 = 59;
46 = 60;
47 = 61;
48 = 62;
49 = 63;
50 = 64;
51 = 65;
52 = 66;
53 = 67;
54 = 68;
55 = 69;
56 = 70;
57 = 71;
58 = 72;
59 = 73;
60 = 74;
61 = 75;
62 = 76;
63 = 77;
64 = 78;
65 = 79;
66 = 80;
67 = 81;
68 = 82;
69 = 83;
70 = 84;
71 = 85;
72 = 86;
73 = 87;
74 = 88;
75 = 89;
76 = 90')
describe(data$age.T1)

#Gender
data<- data %>%
  mutate(gender_r = ifelse((gender.T1 == "Female") & (sex.T1 == "Female"), "Woman", "other"))
data<- data %>%
  mutate(gender_r = ifelse((gender.T1 == "Female") & (sex.T1 == "Male"), "Transgender woman", gender_r))
data<- data %>%
  mutate(gender_r = ifelse((gender.T1 == "Male") & (sex.T1 == "Male"), "Man", gender_r))
data<- data %>%
  mutate(gender_r = ifelse((gender.T1 == "Male") & (sex.T1 == "Female"), "Transgender man", gender_r))
data<- data %>%
  mutate(gender_r = ifelse((gender.T1 == "Genderqueer"), "Genderqueer / Non-binary", gender_r))
table(data$gender_r)

#Race

```

```

table(data$race.T1)
data<-data %>%
  mutate(race_r = ifelse((race.T1 == "Native Hawaiian or Other Pacific Islander") | (race.T1 == "Other"),

#Ethnicity
table(data$ethnicity.T1)

#Income
table(data$income.T1)

#Education
table(data$education.T1)

#Health Literacy
table(data$health_literacy.T1)

#Years Providing Care
table(data$care_duration_y.T1)
data$care_dur_yr = car::recode(data$care_duration_y.T1, '1 = 0; 2 = 1; 3 = 2; 4 = 3; 5 = 4; 6 = 5; 7 = 6; 8 = 7; 9 = 8; 10 = 9; 11 = 10; 12 = 11; 13 = 12; 14 = 13; 15 = 14; 16 = 15; 17 = 16; 18 = 17; 19 = 18; 20 = 19; 21 = 20; 22 = 21; 23 = 22; 24 = 23; 25 = 24; 26 = 25; 27 = 26; 28 = 27; 29 = 28; 30 = 29; 31 = 30; 32 = 31; 33 = 32; 34 = 33; 35 = 34; 36 = 35; 37 = 36; 38 = 37; 39 = 38; 40 = 39; 41 = 40; 42 = 41; 43 = 42; 44 = 43; 45 = 44; 46 = 45; 47 = 46; 48 = 47; 49 = 48; 50 = 49; 51 = 50; 52 = 51; 53 = 52; 54 = 53; 55 = 54; 56 = 55; 57 = 56; 58 = 57; 59 = 58; 60 = 59; 61 = 60; 62 = 61; 63 = 62; 64 = 63; 65 = 64; 66 = 65; 67 = 66; 68 = 67; 69 = 68; 70 = 69; 71 = 70; 72 = 71; 73 = 72; 74 = 73; 75 = 74; 76 = 75; 77 = 76; 78 = 77; 79 = 78; 80 = 79; 81 = 80; 82 = 81; 83 = 82; 84 = 83; 85 = 84; 86 = 85; 87 = 86; 88 = 87; 89 = 88; 90 = 89; 91 = 90; 92 = 91; 93 = 92; 94 = 93; 95 = 94; 96 = 95; 97 = 96; 98 = 97; 99 = 98; 100 = 99; 101 = 100; 102 = 101; 103 = 102; 104 = 103; 105 = 104; 106 = 105; 107 = 106; 108 = 107; 109 = 108; 110 = 109; 111 = 110; 112 = 111; 113 = 112; 114 = 113; 115 = 114; 116 = 115; 117 = 116; 118 = 117; 119 = 118; 120 = 119; 121 = 120; 122 = 121; 123 = 122; 124 = 123; 125 = 124; 126 = 125; 127 = 126; 128 = 127; 129 = 128; 130 = 129; 131 = 130; 132 = 131; 133 = 132; 134 = 133; 135 = 134; 136 = 135; 137 = 136; 138 = 137; 139 = 138; 140 = 139; 141 = 140; 142 = 141; 143 = 142; 144 = 143; 145 = 144; 146 = 145; 147 = 146; 148 = 147; 149 = 148; 150 = 149; 151 = 150; 152 = 151; 153 = 152; 154 = 153; 155 = 154; 156 = 155; 157 = 156; 158 = 157; 159 = 158; 160 = 159; 161 = 160; 162 = 161; 163 = 162; 164 = 163; 165 = 164; 166 = 165; 167 = 166; 168 = 167; 169 = 168; 170 = 169; 171 = 170; 172 = 171; 173 = 172; 174 = 173; 175 = 174; 176 = 175; 177 = 176; 178 = 177; 179 = 178; 180 = 179; 181 = 180; 182 = 181; 183 = 182; 184 = 183; 185 = 184; 186 = 185; 187 = 186; 188 = 187; 189 = 188; 190 = 189; 191 = 190; 192 = 191; 193 = 192; 194 = 193; 195 = 194; 196 = 195; 197 = 196; 198 = 197; 199 = 198; 200 = 199; 201 = 200; 202 = 201; 203 = 202; 204 = 203; 205 = 204; 206 = 205; 207 = 206; 208 = 207; 209 = 208; 210 = 209; 211 = 210; 212 = 211; 213 = 212; 214 = 213; 215 = 214; 216 = 215; 217 = 216; 218 = 217; 219 = 218; 220 = 219; 221 = 220; 222 = 221; 223 = 222; 224 = 223; 225 = 224; 226 = 225; 227 = 226; 228 = 227; 229 = 228; 230 = 229; 231 = 230; 232 = 231; 233 = 232; 234 = 233; 235 = 234; 236 = 235; 237 = 236; 238 = 237; 239 = 238; 240 = 239; 241 = 240; 242 = 241; 243 = 242; 244 = 243; 245 = 244; 246 = 245; 247 = 246; 248 = 247; 249 = 248; 250 = 249; 251 = 250; 252 = 251; 253 = 252; 254 = 253; 255 = 254; 256 = 255; 257 = 256; 258 = 257; 259 = 258; 260 = 259; 261 = 260; 262 = 261; 263 = 262; 264 = 263; 265 = 264; 266 = 265; 267 = 266; 268 = 267; 269 = 268; 270 = 269; 271 = 270; 272 = 271; 273 = 272; 274 = 273; 275 = 274; 276 = 275; 277 = 276; 278 = 277; 279 = 278; 280 = 279; 281 = 280; 282 = 281; 283 = 282; 284 = 283; 285 = 284; 286 = 285; 287 = 286; 288 = 287; 289 = 288; 290 = 289; 291 = 290; 292 = 291; 293 = 292; 294 = 293; 295 = 294; 296 = 295; 297 = 296; 298 = 297; 299 = 298; 300 = 299; 301 = 300; 302 = 301; 303 = 302; 304 = 303; 305 = 304; 306 = 305; 307 = 306; 308 = 307; 309 = 308; 310 = 309; 311 = 310; 312 = 311; 313 = 312; 314 = 313; 315 = 314; 316 = 315; 317 = 316; 318 = 317; 319 = 318; 320 = 319; 321 = 320; 322 = 321; 323 = 322; 324 = 323; 325 = 324; 326 = 325; 327 = 326; 328 = 327; 329 = 328; 330 = 329; 331 = 330; 332 = 331; 333 = 332; 334 = 333; 335 = 334; 336 = 335; 337 = 336; 338 = 337; 339 = 338; 340 = 339; 341 = 340; 342 = 341; 343 = 342; 344 = 343; 345 = 344; 346 = 345; 347 = 346; 348 = 347; 349 = 348; 350 = 349; 351 = 350; 352 = 351; 353 = 352; 354 = 353; 355 = 354; 356 = 355; 357 = 356; 358 = 357; 359 = 358; 360 = 359; 361 = 360; 362 = 361; 363 = 362; 364 = 363; 365 = 364; 366 = 365; 367 = 366; 368 = 367; 369 = 368; 370 = 369; 371 = 370; 372 = 371; 373 = 372; 374 = 373; 375 = 374; 376 = 375; 377 = 376; 378 = 377; 379 = 378; 380 = 379; 381 = 380; 382 = 381; 383 = 382; 384 = 383; 385 = 384; 386 = 385; 387 = 386; 388 = 387; 389 = 388; 390 = 389; 391 = 390; 392 = 391; 393 = 392; 394 = 393; 395 = 394; 396 = 395; 397 = 396; 398 = 397; 399 = 398; 400 = 399; 401 = 400; 402 = 401; 403 = 402; 404 = 403; 405 = 404; 406 = 405; 407 = 406; 408 = 407; 409 = 408; 410 = 409; 411 = 410; 412 = 411; 413 = 412; 414 = 413; 415 = 414; 416 = 415; 417 = 416; 418 = 417; 419 = 418; 420 = 419; 421 = 420; 422 = 421; 423 = 422; 424 = 423; 425 = 424; 426 = 425; 427 = 426; 428 = 427; 429 = 428; 430 = 429; 431 = 430; 432 = 431; 433 = 432; 434 = 433; 435 = 434; 436 = 435; 437 = 436; 438 = 437; 439 = 438; 440 = 439; 441 = 440; 442 = 441; 443 = 442; 444 = 443; 445 = 444; 446 = 445; 447 = 446; 448 = 447; 449 = 448; 450 = 449; 451 = 450; 452 = 451; 453 = 452; 454 = 453; 455 = 454; 456 = 455; 457 = 456; 458 = 457; 459 = 458; 460 = 459; 461 = 460; 462 = 461; 463 = 462; 464 = 463; 465 = 464; 466 = 465; 467 = 466; 468 = 467; 469 = 468; 470 = 469; 471 = 470; 472 = 471; 473 = 472; 474 = 473; 475 = 474; 476 = 475; 477 = 476; 478 = 477; 479 = 478; 480 = 479; 481 = 480; 482 = 481; 483 = 482; 484 = 483; 485 = 484; 486 = 485; 487 = 486; 488 = 487; 489 = 488; 490 = 489; 491 = 490; 492 = 491; 493 = 492; 494 = 493; 495 = 494; 496 = 495; 497 = 496; 498 = 497; 499 = 498; 500 = 499; 501 = 500; 502 = 501; 503 = 502; 504 = 503; 505 = 504; 506 = 505; 507 = 506; 508 = 507; 509 = 508; 510 = 509; 511 = 510; 512 = 511; 513 = 512; 514 = 513; 515 = 514; 516 = 515; 517 = 516; 518 = 517; 519 = 518; 520 = 519; 521 = 520; 522 = 521; 523 = 522; 524 = 523; 525 = 524; 526 = 525; 527 = 526; 528 = 527; 529 = 528; 530 = 529; 531 = 530; 532 = 531; 533 = 532; 534 = 533; 535 = 534; 536 = 535; 537 = 536; 538 = 537; 539 = 538; 540 = 539; 541 = 540; 542 = 541; 543 = 542; 544 = 543; 545 = 544; 546 = 545; 547 = 546; 548 = 547; 549 = 548; 550 = 549; 551 = 550; 552 = 551; 553 = 552; 554 = 553; 555 = 554; 556 = 555; 557 = 556; 558 = 557; 559 = 558; 560 = 559; 561 = 560; 562 = 561; 563 = 562; 564 = 563; 565 = 564; 566 = 565; 567 = 566; 568 = 567; 569 = 568; 570 = 569; 571 = 570; 572 = 571; 573 = 572; 574 = 573; 575 = 574; 576 = 575; 577 = 576; 578 = 577; 579 = 578; 580 = 579; 581 = 580; 582 = 581; 583 = 582; 584 = 583; 585 = 584; 586 = 585; 587 = 586; 588 = 587; 589 = 588; 590 = 589; 591 = 590; 592 = 591; 593 = 592; 594 = 593; 595 = 594; 596 = 595; 597 = 596; 598 = 597; 599 = 598; 600 = 599; 601 = 600; 602 = 601; 603 = 602; 604 = 603; 605 = 604; 606 = 605; 607 = 606; 608 = 607; 609 = 608; 610 = 609; 611 = 610; 612 = 611; 613 = 612; 614 = 613; 615 = 614; 616 = 615; 617 = 616; 618 = 617; 619 = 618; 620 = 619; 621 = 620; 622 = 621; 623 = 622; 624 = 623; 625 = 624; 626 = 625; 627 = 626; 628 = 627; 629 = 628; 630 = 629; 631 = 630; 632 = 631; 633 = 632; 634 = 633; 635 = 634; 636 = 635; 637 = 636; 638 = 637; 639 = 638; 640 = 639; 641 = 640; 642 = 641; 643 = 642; 644 = 643; 645 = 644; 646 = 645; 647 = 646; 648 = 647; 649 = 648; 650 = 649; 651 = 650; 652 = 651; 653 = 652; 654 = 653; 655 = 654; 656 = 655; 657 = 656; 658 = 657; 659 = 658; 660 = 659; 661 = 660; 662 = 661; 663 = 662; 664 = 663; 665 = 664; 666 = 665; 667 = 666; 668 = 667; 669 = 668; 670 = 669; 671 = 670; 672 = 671; 673 = 672; 674 = 673; 675 = 674; 676 = 675; 677 = 676; 678 = 677; 679 = 678; 680 = 679; 681 = 680; 682 = 681; 683 = 682; 684 = 683; 685 = 684; 686 = 685; 687 = 686; 688 = 687; 689 = 688; 690 = 689; 691 = 690; 692 = 691; 693 = 692; 694 = 693; 695 = 694; 696 = 695; 697 = 696; 698 = 697; 699 = 698; 700 = 699; 701 = 700; 702 = 701; 703 = 702; 704 = 703; 705 = 704; 706 = 705; 707 = 706; 708 = 707; 709 = 708; 710 = 709; 711 = 710; 712 = 711; 713 = 712; 714 = 713; 715 = 714; 716 = 715; 717 = 716; 718 = 717; 719 = 718; 720 = 719; 721 = 720; 722 = 721; 723 = 722; 724 = 723; 725 = 724; 726 = 725; 727 = 726; 728 = 727; 729 = 728; 730 = 729; 731 = 730; 732 = 731; 733 = 732; 734 = 733; 735 = 734; 736 = 735; 737 = 736; 738 = 737; 739 = 738; 740 = 739; 741 = 740; 742 = 741; 743 = 742; 744 = 743; 745 = 744; 746 = 745; 747 = 746; 748 = 747; 749 = 748; 750 = 749; 751 = 750; 752 = 751; 753 = 752; 754 = 753; 755 = 754; 756 = 755; 757 = 756; 758 = 757; 759 = 758; 760 = 759; 761 = 760; 762 = 761; 763 = 762; 764 = 763; 765 = 764; 766 = 765; 767 = 766; 768 = 767; 769 = 768; 770 = 769; 771 = 770; 772 = 771; 773 = 772; 774 = 773; 775 = 774; 776 = 775; 777 = 776; 778 = 777; 779 = 778; 780 = 779; 781 = 780; 782 = 781; 783 = 782; 784 = 783; 785 = 784; 786 = 785; 787 = 786; 788 = 787; 789 = 788; 790 = 789; 791 = 790; 792 = 791; 793 = 792; 794 = 793; 795 = 794; 796 = 795; 797 = 796; 798 = 797; 799 = 798; 800 = 799; 801 = 800; 802 = 801; 803 = 802; 804 = 803; 805 = 804; 806 = 805; 807 = 806; 808 = 807; 809 = 808; 810 = 809; 811 = 810; 812 = 811; 813 = 812; 814 = 813; 815 = 814; 816 = 815; 817 = 816; 818 = 817; 819 = 818; 820 = 819; 821 = 820; 822 = 821; 823 = 822; 824 = 823; 825 = 824; 826 = 825; 827 = 826; 828 = 827; 829 = 828; 830 = 829; 831 = 830; 832 = 831; 833 = 832; 834 = 833; 835 = 834; 836 = 835; 837 = 836; 838 = 837; 839 = 838; 840 = 839; 841 = 840; 842 = 841; 843 = 842; 844 = 843; 845 = 844; 846 = 845; 847 = 846; 848 = 847; 849 = 848; 850 = 849; 851 = 850; 852 = 851; 853 = 852; 854 = 853; 855 = 854; 856 = 855; 857 = 856; 858 = 857; 859 = 858; 860 = 859; 861 = 860; 862 = 861; 863 = 862; 864 = 863; 865 = 864; 866 = 865; 867 = 866; 868 = 867; 869 = 868; 870 = 869; 871 = 870; 872 = 871; 873 = 872; 874 = 873; 875 = 874; 876 = 875; 877 = 876; 878 = 877; 879 = 878; 880 = 879; 881 = 880; 882 = 881; 883 = 882; 884 = 883; 885 = 884; 886 = 885; 887 = 886; 888 = 887; 889 = 888; 890 = 889; 891 = 890; 892 = 891; 893 = 892; 894 = 893; 895 = 894; 896 = 895; 897 = 896; 898 = 897; 899 = 898; 900 = 899; 901 = 900; 902 = 901; 903 = 902; 904 = 903; 905 = 904; 906 = 905; 907 = 906; 908 = 907; 909 = 908; 910 = 909; 911 = 910; 912 = 911; 913 = 912; 914 = 913; 915 = 914; 916 = 915; 917 = 916; 918 = 917; 919 = 918; 920 = 919; 921 = 920; 922 = 921; 923 = 922; 924 = 923; 925 = 924; 926 = 925; 927 = 926; 928 = 927; 929 = 928; 930 = 929; 931 = 930; 932 = 931; 933 = 932; 934 = 933; 935 = 934; 936 = 935; 937 = 936; 938 = 937; 939 = 938; 940 = 939; 941 = 940; 942 = 941; 943 = 942; 944 = 943; 945 = 944; 946 = 945; 947 = 946; 948 = 947; 949 = 948; 950 = 949; 951 = 950; 952 = 951; 953 = 952; 954 = 953; 955 = 954; 956 = 955; 957 = 956; 958 = 957; 959 = 958; 960 = 959; 961 = 960; 962 = 961; 963 = 962; 964 = 963; 965 = 964; 966 = 965; 967 = 966; 968 = 967; 969 = 968; 970 = 969; 971 = 970; 972 = 971; 973 = 972; 974 = 973; 975 = 974; 976 = 975; 977 = 976; 978 = 977; 979 = 978; 980 = 979; 981 = 980; 982 = 981; 983 = 982; 984 = 983; 985 = 984; 986 = 985; 987 = 986; 988 = 987; 989 = 988; 990 = 989; 991 = 990; 992 = 991; 993 = 992; 994 = 993; 995 = 994; 996 = 995; 997 = 996; 998 = 997; 999 = 998; 1000 = 999; 1001 = 1000; 1002 = 1001; 1003 = 1002; 1004 = 1003; 1005 = 1004; 1006 = 1005; 1007 = 1006; 1008 = 1007; 1009 = 1008; 1010 = 1009; 1011 = 1010; 1012 = 1011; 1013 = 1012; 1014 = 1013; 1015 = 1014; 1016 = 1015; 1017 = 1016; 1018 = 1017; 1019 = 1018; 1020 = 1019; 1021 = 1020; 1022 = 1021; 1023 = 1022; 1024 = 1023; 1025 = 1024; 1026 = 1025; 1027 = 1026; 1028 = 1027; 1029 = 1028; 1030 = 1029; 1031 = 1030; 1032 = 1031; 1033 = 1032; 1034 = 1033; 1035 = 1034; 1036 = 1035; 1037 = 1036; 1038 = 1037; 1039 = 1038; 1040 = 1039; 1041 = 1040; 1042 = 1041; 1043 = 1042; 1044 = 1043; 1045 = 1044; 1046 = 1045; 1047 = 1046; 1048 = 1047; 1049 = 1048; 1050 = 1049; 1051 = 1050; 1052 = 1051; 1053 = 1052; 1054 = 1053; 1055 = 1054; 1056 = 1055; 1057 = 1056; 1058 = 1057; 1059 = 1058; 1060 = 1059; 1061 = 1060; 1062 = 1061; 1063 = 1062; 1064 = 1063; 1065 = 1064; 1066 = 1065; 1067 = 1066; 1068 = 1067; 1069 = 1068; 1070 = 1069; 1071 = 1070; 1072 = 1071; 1073 = 1072; 1074 = 1073; 1075 = 1074; 1076 = 1075; 1077 = 1076; 1078 = 1077; 1079 = 1078; 1080 = 1079; 1081 = 1080; 1082 = 1081; 1083 = 1082; 1084 = 1083; 1085 = 1084; 1086 = 1085; 1087 = 1086; 1088 = 1087; 1089 = 1088; 1090 = 1089; 1091 = 1090; 1092 = 1091; 1093 = 1092; 1094 = 1093; 1095 = 1094; 1096 = 1095; 1097 = 1096; 1098 = 1097; 1099 = 1098; 1100 = 1099; 1101 = 1100; 1102 = 1101; 1103 = 1102; 1104 = 1103; 1105 = 1104; 1106 = 1105; 1107 = 1106; 1108 = 1107; 1109 = 1108; 1110 = 1109; 1111 = 1110; 1112 = 1111; 1113 = 1112; 1114 = 1113; 1115 = 1114; 1116 = 1115; 1117 = 1116; 1118 = 1117; 1119 = 1118; 1120 = 1119; 1121 = 1120; 1122 = 1121; 1123 = 1122; 1124 = 1123; 1125 = 1124; 1126 = 1125; 1127 = 1126; 1128 = 1127; 1129 = 1128; 1130 = 1129; 1131 = 1130; 1132 = 1131; 1133 = 1132; 1134 = 1133; 1135 = 1134; 1136 = 1135; 1137 = 1136; 1138 = 1137; 1139 = 1138; 1140 = 1139; 1141 = 1140; 1142 = 1141; 1143 = 1142; 1144 = 1143; 1145 = 1144; 1146 = 1145; 1147 = 1146; 1148 = 1147; 1149 = 1148; 1150 = 1149; 1151 = 1150; 1152 = 1151; 1153 = 1152; 1154 = 1153; 1155 = 1154; 1156 = 1155; 1157 = 1156; 1158 = 1157; 1159 = 1158; 1160 = 1159; 1161 = 1160; 1162 = 1161; 1163 = 1162; 1164 = 1163; 1165 = 1164; 1166 = 1165; 1167 = 1166; 1168 = 1167; 1169 = 1168; 1170 = 1169; 1171 = 1170; 1172 = 1171; 1173 = 1172; 1174 = 1173; 1175 = 1174; 1176 = 1175; 1177 = 1176; 1178 = 1177; 1179 = 1178; 1180 = 1179; 1181 = 1180; 1182 = 1181; 1183 = 1182; 1184 = 1183; 1185 = 1184; 1186 = 1185; 1187 = 1186; 1188 = 1187; 1189 = 1188; 1190 = 1189; 1191 = 1190; 1192 = 1191; 1193 = 1192; 1194 = 1193; 1195 = 1194; 1196 = 1195; 1197 = 1196; 1198 = 1197; 1199 = 1198; 1200 = 1199; 1201 = 1200; 1202 = 1201; 1203 = 1202;
```

```
101 = 11;  
102 = 12;  
103 = 13;  
104 = 14;  
105 = 15;  
106 = 16;  
107 = 17;  
108 = 18;  
109 = 19;  
110 = 20;  
111 = 21;  
112 = 22;  
113 = 23;  
114 = 24;  
115 = 25;  
116 = 26;  
117 = 27;  
118 = 28;  
119 = 29;  
120 = 30;  
121 = 31;  
122 = 32;  
123 = 33;  
124 = 34;  
125 = 35;  
126 = 36;  
127 = 37;  
128 = 38;  
129 = 39;  
130 = 40;  
131 = 41;  
132 = 42;  
133 = 43;  
134 = 44;  
135 = 45;  
136 = 46;  
137 = 47;  
138 = 48;  
139 = 49;  
140 = 50;  
141 = 51;  
142 = 52;  
143 = 53;  
144 = 54;  
145 = 55;  
146 = 56;  
147 = 57;  
148 = 58;  
149 = 59;  
150 = 60;  
151 = 61;  
152 = 62;  
153 = 63;
```

```

154 = 64;
155 = 65;
156 = 66;
157 = 67;
158 = 68;
159 = 69;
160 = 70;
161 = 71;
162 = 72;
163 = 73;
164 = 74;
165 = 75;
166 = 76;
167 = 77;
168 = 78;
169 = 79;
170 = 80;
171 = 81;
172 = 82;
173 = 83;
174 = 84;
175 = 85;
176 = 86;
177 = 87;
178 = 88;
179 = 89;
180 = 90')

data$CR_age.T1<-car::recode(data$CR_age.T1, '4 = "Less than 1 year old";
92 = "1";
93 = "2";
94 = "3";
95 = "4";
96 = "5";
97 = "6";
98 = "7";
5 = "8";
99 = "9";
100 = "10";
101 = "11";
102 = "12";
103 = "13";
104 = "14";
105 = "15";
106 = "16";
107 = "17";
108 = "18";
109 = "19";
110 = "20";
111 = "21";
112 = "22";
113 = "23";
114 = "24";

```

```
115 = "25";
116 = "26";
117 = "27";
118 = "28";
119 = "29";
120 = "30";
121 = "31";
122 = "32";
123 = "33";
124 = "34";
125 = "35";
126 = "36";
127 = "37";
128 = "38";
129 = "39";
130 = "40";
131 = "41";
132 = "42";
133 = "43";
134 = "44";
135 = "45";
136 = "46";
137 = "47";
138 = "48";
139 = "49";
140 = "50";
141 = "51";
142 = "52";
143 = "53";
144 = "54";
145 = "55";
146 = "56";
147 = "57";
148 = "58";
149 = "59";
150 = "60";
151 = "61";
152 = "62";
153 = "63";
154 = "64";
155 = "65";
156 = "66";
157 = "67";
158 = "68";
159 = "69";
160 = "70";
161 = "71";
162 = "72";
163 = "73";
164 = "74";
165 = "75";
166 = "76";
167 = "77";
```

```

168 = "78";
169 = "79";
170 = "80";
171 = "81";
172 = "82";
173 = "83";
174 = "84";
175 = "85";
176 = "86";
177 = "87";
178 = "88";
179 = "89";
180 = "90 or older"')

#Caregiver Relationship to Patient
table(data$CR_relationship.T1)

#Primary care recipient primary condition
table(data$CR_condition.T1)

```

Caregiving-related User Characteristics

```

#Pearlin Stress Scale (PSS) - Overload Subscale
##4 items, All positively scored
##No recoding necessary
##Run descriptives
describe(data$overload1.T1)
describe(data$overload2.T1)
describe(data$overload3.T1)
describe(data$overload4.T1)

describe(data$overload1.T2u)
describe(data$overload2.T2u)
describe(data$overload3.T2u)
describe(data$overload4.T2u)

describe(data$overload1.T2n)
describe(data$overload2.T2n)
describe(data$overload3.T2n)
describe(data$overload4.T2n)

##Calculate cronbach alpha
overload.T1<- data %>%
  dplyr::select(overload1.T1, overload2.T1, overload3.T1, overload4.T1)
ltm::cronbach.alpha(overload.T1, na.rm=TRUE)

overload.T2u<- data %>%
  dplyr::select(overload1.T2u, overload2.T2u, overload3.T2u, overload4.T2u)
ltm::cronbach.alpha(overload.T2u, na.rm=TRUE)

overload.T2n<- data %>%

```



```

    dplyr::select(overload1.T2n, overload2.T2n, overload3.T2n, overload4.T2n)
ltm::cronbach.alpha(overload.T2n, na.rm=TRUE)

rm(overload.T1, overload.T2u, overload.T2n)

##Compute subscale score
data %>%
  dplyr::select(PID.T1, overload1.T1, overload2.T1, overload3.T1, overload4.T1) %>%
  mutate(overload.T1 = overload1.T1 + overload2.T1 + overload3.T1 + overload4.T1) %>%
  view()

data<-data %>%
  mutate(overload.T1 = overload1.T1 + overload2.T1 + overload3.T1 + overload4.T1)

data %>%
  dplyr::select(PID.T1, overload1.T2u, overload2.T2u, overload3.T2u, overload4.T2u) %>%
  mutate(overload.T2u = overload1.T2u + overload2.T2u + overload3.T2u + overload4.T2u) %>%
  view()

data<-data %>%
  mutate(overload.T2u = overload1.T2u + overload2.T2u + overload3.T2u + overload4.T2u)

data %>%
  dplyr::select(PID.T1, overload1.T2n, overload2.T2n, overload3.T2n, overload4.T2n) %>%
  mutate(overload.T2n = overload1.T2n + overload2.T2n + overload3.T2n + overload4.T2n) %>%
  view()

data<-data %>%
  mutate(overload.T2n = overload1.T2n + overload2.T2n + overload3.T2n + overload4.T2n)
#End PSS - Overload Subscale

#Pearlin Stress Scale (PSS) - Caregiving Competence Subscale
##4 items
##No recoding necessary
##Run descriptives
describe(data$cgefficacy1.T1)
describe(data$cgefficacy2.T1)
describe(data$cgefficacy3.T1)
describe(data$cgefficacy4.T1)

##Calculate cronbach alpha for subscale
cgefficacy<- data %>%
  dplyr::select(cgefficacy1.T1:cgefficacy4.T1)
ltm::cronbach.alpha(cgefficacy, na.rm=TRUE)

rm(cgefficacy)

##Compute subscale score
data %>%
  dplyr::select(PID.T1, cgefficacy1.T1, cgefficacy2.T1, cgefficacy3.T1, cgefficacy4.T1) %>%

```

```

mutate(cgefficacy.T1 = cgefficacy1.T1 + cgefficacy2.T1 + cgefficacy3.T1 + cgefficacy4.T1) %>%
view()

data<-data %>%
  mutate(cgefficacy.T1 = cgefficacy1.T1 + cgefficacy2.T1 + cgefficacy3.T1 + cgefficacy4.T1)
#End PSS - Caregiving Competence Subscale

#Caregiver Guilt Questionnaire
##Only used 3 of 5 subscales in SHUTi CARE Study.
##Begin Guilt about Doing Wrong by the Care Recipient Subscale (of Caregiver Guilt Questionnaire)
###7 items
###All positively scored
###Original items #2, 8, 10, 11, 12, 14, 20; baseline questionnaire items #2, 6, 8, 9, 10, 12, 15.
describe(data$guilt_dowrong1.T1)
describe(data$guilt_dowrong2.T1)
describe(data$guilt_dowrong3.T1)
describe(data$guilt_dowrong4.T1)
describe(data$guilt_dowrong5.T1)
describe(data$guilt_dowrong6.T1)
describe(data$guilt_dowrong7.T1)

###RECODE: all items in original manuscript were scored on a scale of 0 (never) to 4 (always or almost
data$guilt_dowrong1.T1 <-car::recode(data$guilt_dowrong1.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong2.T1 <-car::recode(data$guilt_dowrong2.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong3.T1 <-car::recode(data$guilt_dowrong3.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong4.T1 <-car::recode(data$guilt_dowrong4.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong5.T1 <-car::recode(data$guilt_dowrong5.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong6.T1 <-car::recode(data$guilt_dowrong6.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_dowrong7.T1 <-car::recode(data$guilt_dowrong7.T1,'1=0; 2=1; 3=2; 4=3; 5=4')

###Repeat descriptives after recoding.
describe(data$guilt_dowrong1.T1)
describe(data$guilt_dowrong2.T1)
describe(data$guilt_dowrong3.T1)
describe(data$guilt_dowrong4.T1)
describe(data$guilt_dowrong5.T1)
describe(data$guilt_dowrong6.T1)
describe(data$guilt_dowrong7.T1)

###Compute subscale score and calculate cronbach alpha for subscale.
cgguilt_wrong.T1 <-data %>%
  dplyr::select(guilt_dowrong1.T1, guilt_dowrong2.T1, guilt_dowrong3.T1, guilt_dowrong4.T1, guilt_dowrong5.T1, guilt_dowrong6.T1, guilt_dowrong7.T1) %>%
  ltm::cronbach.alpha(cgguilt_wrong.T1)

rm(cgguilt_wrong.T1)

data %>%
  dplyr::select(PID.T1, guilt_dowrong1.T1, guilt_dowrong2.T1, guilt_dowrong3.T1, guilt_dowrong4.T1, guilt_dowrong5.T1, guilt_dowrong6.T1, guilt_dowrong7.T1) %>%
  mutate(cgguilt_wrong.T1 = guilt_dowrong1.T1 + guilt_dowrong2.T1 + guilt_dowrong3.T1 + guilt_dowrong4.T1 + guilt_dowrong5.T1 + guilt_dowrong6.T1 + guilt_dowrong7.T1) %>%
  View()

```

```

data <- data %>%
  mutate(cgguilt_wrong.T1 = guilt_dowrong1.T1 + guilt_dowrong2.T1 + guilt_dowrong3.T1 + guilt_dowrong4.T1)
##End Guilt about Doing Wrong by the Care Recipient Subscale (of Caregiver Guilt Questionnaire)

##Begin Guilt about Failing to Meet the Challenges of Caregiver Subscale (of Caregiver Guilt Questionnaire)
###6 items
###5 positively scored, manuscript item 6/baseline question 4 inversely scored
###Original items #5, 6, 9, 13, 21, 22; baseline questionnaire items #3, 4, 7, 11, 16, 17.
describe(data$guilt_notrise1.T1)
describe(data$guilt_notrise2.T1)
describe(data$guilt_notrise3.T1)
describe(data$guilt_notrise4.T1)
describe(data$guilt_notrise5.T1)
describe(data$guilt_notrise6.T1)

###RECODE: all items in original manuscript were scored on a scale of 0 (never) to 4 (always or almost always)
###Item guilt_notrise2.T1 should be reverse scored.
data$guilt_notrise1.T1<- car::recode(data$guilt_notrise1.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_notrise2.T1<- car::recode(data$guilt_notrise2.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$guilt_notrise3.T1<- car::recode(data$guilt_notrise3.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_notrise4.T1<- car::recode(data$guilt_notrise4.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_notrise5.T1<- car::recode(data$guilt_notrise5.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_notrise6.T1<- car::recode(data$guilt_notrise6.T1,'1=0; 2=1; 3=2; 4=3; 5=4')

###Repeat descriptives after recoding.
describe(data$guilt_notrise1.T1)
describe(data$guilt_notrise2.T1)
describe(data$guilt_notrise3.T1)
describe(data$guilt_notrise4.T1)
describe(data$guilt_notrise5.T1)
describe(data$guilt_notrise6.T1)

###Compute subscale score and calculate cronbach alpha for subscale.
cgguilt_fail.T1 <-data %>%
  dplyr::select(guilt_notrise1.T1, guilt_notrise2.T1, guilt_notrise3.T1, guilt_notrise4.T1, guilt_notrise5.T1, guilt_notrise6.T1)
  ltm::cronbach.alpha(cgguilt_fail.T1)

rm(cgguilt_fail.T1)

data %>%
  dplyr::select(PID.T1, guilt_notrise1.T1, guilt_notrise2.T1, guilt_notrise3.T1, guilt_notrise4.T1, guilt_notrise5.T1, guilt_notrise6.T1)
  mutate(cgguilt_fail.T1 = guilt_notrise1.T1 + guilt_notrise2.T1 + guilt_notrise3.T1 + guilt_notrise4.T1 + guilt_notrise5.T1 + guilt_notrise6.T1)
  View()

data <- data %>%
  mutate(cgguilt_fail.T1 = guilt_notrise1.T1 + guilt_notrise2.T1 + guilt_notrise3.T1 + guilt_notrise4.T1 + guilt_notrise5.T1 + guilt_notrise6.T1)
##End Guilt about Failing to Meet the Challenges of Caregiver Subscale (of Caregiver Guilt Questionnaire)

##Begin Guilt about SelfCare Subscale (of Caregiver Guilt Questionnaire)
###4 items

```

```

###All positively scored
###Original items #1, 7, 15, 16; baseline questionnaire items #1, 5, 13, 14.
describe(data$guilt_selfcare1.T1)
describe(data$guilt_selfcare2.T1)
describe(data$guilt_selfcare3.T1)
describe(data$guilt_selfcare4.T1)

###RECODE: all items in original manuscript were scored on a scale of 0 (never) to 4 (always or almost .
data$guilt_selfcare1.T1 <-car::recode(data$guilt_selfcare1.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_selfcare2.T1 <-car::recode(data$guilt_selfcare2.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_selfcare3.T1 <-car::recode(data$guilt_selfcare3.T1,'1=0; 2=1; 3=2; 4=3; 5=4')
data$guilt_selfcare4.T1 <-car::recode(data$guilt_selfcare4.T1,'1=0; 2=1; 3=2; 4=3; 5=4')

###Repeat descriptives after recoding.
describe(data$guilt_selfcare1.T1)
describe(data$guilt_selfcare2.T1)
describe(data$guilt_selfcare3.T1)
describe(data$guilt_selfcare4.T1)

###Compute subscale score and calculate cronbach alpha for subscale.
cgguilt_selfcare.T1 <-data %>%
  dplyr::select(guilt_selfcare1.T1, guilt_selfcare2.T1, guilt_selfcare3.T1, guilt_selfcare4.T1)
ltm::cronbach.alpha(cgguilt_selfcare.T1)

rm(cgguilt_selfcare.T1)

data %>%
  dplyr::select(PID.T1, guilt_selfcare1.T1, guilt_selfcare2.T1, guilt_selfcare3.T1, guilt_selfcare4.T1)
  mutate(cgguilt_selfcare.T1 = guilt_selfcare1.T1 + guilt_selfcare2.T1 + guilt_selfcare3.T1 + guilt_sel
  View()

data <- data %>%
  mutate(cgguilt_selfcare.T1 = guilt_selfcare1.T1 + guilt_selfcare2.T1 + guilt_selfcare3.T1 + guilt_sel
##End Guilt about SelfCare Subscale (of Caregiver Guilt Questionnaire)
#End Caregiver Guilt Questionnaire

```

Caregiving-related Environmental Characteristics

```

#Proximity
table(data$CR_live.T1)
data<- data %>%
  mutate(cr_proximity.T1 = ifelse(CR_same_room.T1 == "Yes", "Bedpartner", "Live together"))
data<- data %>%
  mutate(cr_proximity.T1 = ifelse(CR_live.T1 != "In your household", "Other Living Sit", cr_proximity.T1)
table(data$cr_proximity.T1)

#Modified Barthel Activities of Daily Living [ADL] Index
##10 items
##Items scored in original manuscript with 0 as unable/greatest dependency (through up to 3 pts, depend
#Run descriptives on original items
describe(data$adl_bowels.T1)

```

```

describe(data$adl_bladder.T1)
describe(data$adl_grooming.T1)
describe(data$adl_toilet.T1)
describe(data$adl_feeding.T1)
describe(data$adl_transfer.T1)
describe(data$adl_mobility.T1)
describe(data$adl_dressing.T1)
describe(data$adl_stairs.T1)
describe(data$adl_bathing.T1)

##Recode items to match original manuscript scoring of 0-3 (or less)
data$adl_bowels.T1<-car::recode(data$adl_bowels.T1, '1=0; 2=1; 3=2')
data$adl_bladder.T1<-car::recode(data$adl_bladder.T1, '1=0; 2=1; 3=2')
data$adl_grooming.T1<-car::recode(data$adl_grooming.T1, '1=0; 3=1')
data$adl_toilet.T1<-car::recode(data$adl_toilet.T1, '1=0; 3=1; 4=2')
data$adl_feeding.T1<-car::recode(data$adl_feeding.T1, '1=0; 2=1; 3=2')
data$adl_transfer.T1<-car::recode(data$adl_transfer.T1, '1=0; 2=1; 3=2; 4=3')
data$adl_mobility.T1<-car::recode(data$adl_mobility.T1, '1=0; 2=1; 3=2; 4=3')
data$adl_dressing.T1<-car::recode(data$adl_dressing.T1, '1=0; 2=1; 4=2')
data$adl_stairs.T1<-car::recode(data$adl_stairs.T1, '1=0; 2=1; 3=2')
data$adl_bathing.T1<-car::recode(data$adl_bathing.T1, '1=0; 2=1')

#Repeat descriptives on recoded items
describe(data$adl_bowels.T1)
describe(data$adl_bladder.T1)
describe(data$adl_grooming.T1)
describe(data$adl_toilet.T1)
describe(data$adl_feeding.T1)
describe(data$adl_transfer.T1)
describe(data$adl_mobility.T1)
describe(data$adl_dressing.T1)
describe(data$adl_stairs.T1)
describe(data$adl_bathing.T1)

##Compute score between 0-20 points by summing total points from items
###QUESTION: LEADS TO SCORES GREATER THAN 20 POINTS - NEED TO BE RESCALED FURTHER? RESCORING CORRECT?
data %>%
  dplyr::select(PID.T1, adl_bowels.T1, adl_bladder.T1, adl_grooming.T1, adl_toilet.T1, adl_feeding.T1, )
  mutate(barthel.T1 = adl_bowels.T1 + adl_bladder.T1 + adl_grooming.T1 + adl_toilet.T1 + adl_feeding.T1)
  view()

data <- data %>%
  mutate(barthel.T1 = adl_bowels.T1 + adl_bladder.T1 + adl_grooming.T1 + adl_toilet.T1 + adl_feeding.T1)
#End Barthel ADL Index

#Pearlin Stress Scale (PSS) - Cognitive Status Subscale
##8 items
##All scored positively, with higher scores reflecting more significant cognitive difficulties
##Run descriptives on all items
describe(data$pss_cognitive1.T1)
describe(data$pss_cognitive2.T1)
describe(data$pss_cognitive3.T1)

```

```

describe(data$pss_cognitive4.T1)
describe(data$pss_cognitive5.T1)
describe(data$pss_cognitive6.T1)
describe(data$pss_cognitive7.T1)
describe(data$pss_cognitive8.T1)

##RECODE: Original manuscript scored 0/Not at all difficult - 4/Can't do at all; Qualtrics scored 1/Can
data$pss_cognitive1.T1<-car::recode(data$pss_cognitive1.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive2.T1<-car::recode(data$pss_cognitive2.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive3.T1<-car::recode(data$pss_cognitive3.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive4.T1<-car::recode(data$pss_cognitive4.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive5.T1<-car::recode(data$pss_cognitive5.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive6.T1<-car::recode(data$pss_cognitive6.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive7.T1<-car::recode(data$pss_cognitive7.T1,'1=4; 2=3; 3=2; 4=1; 5=0')
data$pss_cognitive8.T1<-car::recode(data$pss_cognitive8.T1,'1=4; 2=3; 3=2; 4=1; 5=0')

##Rerun descriptives with rescored items
describe(data$pss_cognitive1.T1)
describe(data$pss_cognitive2.T1)
describe(data$pss_cognitive3.T1)
describe(data$pss_cognitive4.T1)
describe(data$pss_cognitive5.T1)
describe(data$pss_cognitive6.T1)
describe(data$pss_cognitive7.T1)
describe(data$pss_cognitive8.T1)

##Calculate Cronbach alpha and compute scale
pss_cognitive.T1<-data %>%
  dplyr::select(pss_cognitive1.T1, pss_cognitive2.T1, pss_cognitive3.T1, pss_cognitive4.T1, pss_cogniti
ltm::cronbach.alpha(pss_cognitive.T1)

rm(pss_cognitive.T1)

data %>%
  dplyr::select(PID.T1, pss_cognitive1.T1, pss_cognitive2.T1, pss_cognitive3.T1, pss_cognitive4.T1, pss
mutate(pss_cognitive.T1 = pss_cognitive1.T1 + pss_cognitive2.T1 + pss_cognitive3.T1 + pss_cognitive4.
View()

data<-data %>%
  mutate(pss_cognitive.T1 = pss_cognitive1.T1 + pss_cognitive2.T1 + pss_cognitive3.T1 + pss_cognitive4.
#End PSS - Cognitive Status Subscale

#Pearlin Stress Scale (PSS) - Problematic Behavior Subscale
##14 items
##All positively scored
##Run descriptives on original items
describe(data$pss_behavior1.T1)
describe(data$pss_behavior2.T1)
describe(data$pss_behavior3.T1)
describe(data$pss_behavior4.T1)
describe(data$pss_behavior5.T1)

```

```

describe(data$pss_behavior6.T1)
describe(data$pss_behavior7.T1)
describe(data$pss_behavior8.T1)
describe(data$pss_behavior9.T1)
describe(data$pss_behavior10.T1)
describe(data$pss_behavior11.T1)
describe(data$pss_behavior12.T1)
describe(data$pss_behavior13.T1)
describe(data$pss_behavior14.T1)

```

##RECODE: all items in original manuscript were scored on a scale of 1 (No days) to 4 (5 or more days),

```

data$pss_behavior1.T1<-car::recode(data$pss_behavior1.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior2.T1<-car::recode(data$pss_behavior2.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior3.T1<-car::recode(data$pss_behavior3.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior4.T1<-car::recode(data$pss_behavior4.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior5.T1<-car::recode(data$pss_behavior5.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior6.T1<-car::recode(data$pss_behavior6.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior7.T1<-car::recode(data$pss_behavior7.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior8.T1<-car::recode(data$pss_behavior8.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior9.T1<-car::recode(data$pss_behavior9.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior10.T1<-car::recode(data$pss_behavior10.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior11.T1<-car::recode(data$pss_behavior11.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior12.T1<-car::recode(data$pss_behavior12.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior13.T1<-car::recode(data$pss_behavior13.T1,'1=4; 2=3; 3=2; 4=1')
data$pss_behavior14.T1<-car::recode(data$pss_behavior14.T1,'1=4; 2=3; 3=2; 4=1')

```

##Repeat descriptives after recoding.

```

describe(data$pss_behavior1.T1)
describe(data$pss_behavior2.T1)
describe(data$pss_behavior3.T1)
describe(data$pss_behavior4.T1)
describe(data$pss_behavior5.T1)
describe(data$pss_behavior6.T1)
describe(data$pss_behavior7.T1)
describe(data$pss_behavior8.T1)
describe(data$pss_behavior9.T1)
describe(data$pss_behavior10.T1)
describe(data$pss_behavior11.T1)
describe(data$pss_behavior12.T1)
describe(data$pss_behavior13.T1)
describe(data$pss_behavior14.T1)

```

###Compute subscale score and calculate cronbach alpha for subscale.

```

pss_probbehav.T1<-data %>%
  dplyr::select(pss_behavior1.T1, pss_behavior2.T1, pss_behavior3.T1, pss_behavior4.T1, pss_behavior5.T1)
ltm::cronbach.alpha(pss_probbehav.T1)

rm(pss_probbehav.T1)

```

data %>%

```

dplyr::select(PID.T1, pss_behavior1.T1, pss_behavior2.T1, pss_behavior3.T1, pss_behavior4.T1, pss_behavior5.T1)
mutate(pss_probbehav = pss_behavior1.T1 + pss_behavior2.T1 + pss_behavior3.T1 + pss_behavior4.T1 + pss_behavior5.T1)

```

```

View()

data<-data %>%
  mutate(pss_probbehav.T1 = pss_behavior1.T1 + pss_behavior2.T1 + pss_behavior3.T1 + pss_behavior4.T1 +
#End PSS - Problematic Behavior Subscale

#Begin National Caregiving Association Caregiving Index
#describe each variable first

##start with ADLs
data<- data %>%
  mutate(adl.bedchair.T1 = ifelse(grepl(1, adl_tasks.T1), 1, 0))
data<- data %>%
  mutate(adl.dress.T1 = ifelse(grepl(2, adl_tasks.T1), 1, 0))
data<- data %>%
  mutate(adl.toilet.T1 = ifelse(grepl(3, adl_tasks.T1), 1, 0))
data<- data %>%
  mutate(adl.bath.T1 = ifelse(grepl(4, adl_tasks.T1), 1, 0))
data<- data %>%
  mutate(adl.incontinence.T1 = ifelse(grepl(5, adl_tasks.T1), 1, 0))
data<- data %>%
  mutate(adl.feed.T1 = ifelse(grepl(6, adl_tasks.T1), 1, 0))

table(data$adl.bedchair.T1)
table(data$adl.dress.T1)
table(data$adl.toilet.T1)
table(data$adl.bath.T1)
table(data$adl.incontinence.T1)
table(data$adl.feed.T1)

##next do IADLs
data<- data %>%
  mutate(iadl.medicine.T1 = ifelse(grepl(1, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.finances.T1 = ifelse(grepl(2, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.shop.T1 = ifelse(grepl(3, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.housework.T1 = ifelse(grepl(4, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.cook.T1 = ifelse(grepl(5, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.transportation.T1 = ifelse(grepl(6, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.services.T1 = ifelse(grepl(7, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.advocate.T1 = ifelse(grepl(8, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.monitor.T1 = ifelse(grepl(9, iadl_tasks.T1), 1, 0))
data<- data %>%
  mutate(iadl.communicate.T1 = ifelse(grepl(10, iadl_tasks.T1), 1, 0))

```



```

table(data$iadl.medicine.T1)
table(data$iadl.finances.T1)
table(data$iadl.shop.T1)
table(data$iadl.housework.T1)
table(data$iadl.cook.T1)
table(data$iadl.transportation.T1)
table(data$iadl.services.T1)
table(data$iadl.advocate.T1)
table(data$iadl.monitor.T1)
table(data$iadl.communicate.T1)

##Conditionally score ADLs depending on the age of the primary care recipient
data<-data %>%
  mutate(adl.bedchair.r.T1 = ifelse(CR_age_r < 3, NA, adl.bedchair.T1))
data<-data %>%
  mutate(adl.dress.r.T1 = ifelse(CR_age_r < 4, NA, adl.dress.T1))
data<-data %>%
  mutate(adl.toilet.r.T1 = ifelse(CR_age_r < 4, NA, adl.toilet.T1))
data<-data %>%
  mutate(adl.bath.r.T1 = ifelse(CR_age_r < 6, NA, adl.bath.T1))
data<-data %>%
  mutate(adl.incontinence.r.T1 = ifelse(CR_age_r < 4, NA, adl.incontinence.T1))
data<-data %>%
  mutate(adl.feed.r.T1 = ifelse(CR_age_r < 3, NA, adl.feed.T1))

##Conditionally score IADLs depending on the age of the primary care recipient
###No age condition for medicine
###No age condition for finances
data<-data %>%
  mutate(iadl.shop.r.T1 = ifelse(CR_age_r < 18, NA, iadl.shop.T1))
data<-data %>%
  mutate(iadl.housework.r.T1 = ifelse(CR_age_r < 18, NA, iadl.housework.T1))
data<-data %>%
  mutate(iadl.cook.r.T1 = ifelse(CR_age_r < 18, NA, iadl.cook.T1))
data<-data %>%
  mutate(iadl.transportation.r.T1 = ifelse(CR_age_r < 18, NA, iadl.transportation.T1))
###No age condition for services
###No age condition for advocate
###No age condition for monitor
###No age condition for communication

#Calculate number of ADLs for primary care recipient
data %>%
  dplyr::select(PID.T1, adl.bedchair.r.T1, adl.dress.r.T1, adl.toilet.r.T1, adl.bath.r.T1, adl.incontinence.r.T1)
  rowwise() %>%
  mutate(adl.T1 = sum(adl.bedchair.r.T1, adl.dress.r.T1, adl.toilet.r.T1, adl.bath.r.T1, adl.incontinence.r.T1))
  view()

data <- data %>%
  rowwise() %>%
  mutate(adl.T1 = sum(adl.bedchair.r.T1, adl.dress.r.T1, adl.toilet.r.T1, adl.bath.r.T1, adl.incontinence.r.T1))

```

```

#Calculate number of IADLs for primary care recipient
data %>%
  dplyr::select(PID.T1, iadl.medicine.T1, iadl.finances.T1, iadl.shop.r.T1, iadl.housework.r.T1, iadl.co
  rowwise() %>%
  mutate(iadl.T1 = sum(iadl.medicine.T1, iadl.finances.T1, iadl.shop.r.T1, iadl.housework.r.T1, iadl.co
  view()

data <- data %>%
  rowwise() %>%
  mutate(iadl.T1 = sum(iadl.medicine.T1, iadl.finances.T1, iadl.shop.r.T1, iadl.housework.r.T1, iadl.co

#Medical tasks
data$med_nursing_tasks.T1 <- car::recode(data$med_nursing_tasks.T1, '1 = "Yes"; 2 = "No"')
#End National Caregiving Alliance ADL/IADL

```

Cognitive mechanisms

```

#Dysfunctional Beliefs and Attitudes about Sleep (DBAS) Scale
##16 items
##All positively scored
##Run descriptives on items
describe(data$dbas_1.T1)
describe(data$dbas_2.T1)
describe(data$dbas_3.T1)
describe(data$dbas_4.T1)
describe(data$dbas_5.T1)
describe(data$dbas_6.T1)
describe(data$dbas_7.T1)
describe(data$dbas_8.T1)
describe(data$dbas_9.T1)
describe(data$dbas_10.T1)
describe(data$dbas_11.T1)
describe(data$dbas_12.T1)
describe(data$dbas_13.T1)
describe(data$dbas_14.T1)
describe(data$dbas_15.T1)
describe(data$dbas_16.T1)

describe(data$dbas1.T2u)
describe(data$dbas2.T2u)
describe(data$dbas3.T2u)
describe(data$dbas4.T2u)
describe(data$dbas5.T2u)
describe(data$dbas6.T2u)
describe(data$dbas7.T2u)
describe(data$dbas8.T2u)
describe(data$dbas9.T2u)
describe(data$dbas10.T2u)
describe(data$dbas11.T2u)
describe(data$dbas12.T2u)
describe(data$dbas13.T2u)
describe(data$dbas14.T2u)
describe(data$dbas15.T2u)

```

```
describe(data$dbas16.T2u)
```

```
##RECODE: Original manuscript scored 0-10, Qualtrics scoring is 1-11 (text options say 0-10)
```

```
data$dbas_1.T1<- car::recode(data$dbas_1.T1, '1 = 0; 3 = 1; 4 = 2; 5 = 3; 6 = 4; 7 = 5; 8 = 6; 12 = 7;'  
data<-data %>%
```

```
  mutate(dbas_2.T1 = dbas_2.T1-1,  
         dbas_3.T1 = dbas_3.T1-1,  
         dbas_4.T1 = dbas_4.T1-1,  
         dbas_5.T1 = dbas_5.T1-1,  
         dbas_6.T1 = dbas_6.T1-1,  
         dbas_7.T1 = dbas_7.T1-1,  
         dbas_8.T1 = dbas_8.T1-1,  
         dbas_9.T1 = dbas_9.T1-1,  
         dbas_10.T1 = dbas_10.T1-1,  
         dbas_11.T1 = dbas_11.T1-1,  
         dbas_12.T1 = dbas_12.T1-1,  
         dbas_13.T1 = dbas_13.T1-1,  
         dbas_14.T1 = dbas_14.T1-1,  
         dbas_15.T1 = dbas_15.T1-1,  
         dbas_16.T1 = dbas_16.T1-1)
```

```
data$dbas_1.T2u<- car::recode(data$dbas1.T2u, '1 = 0; 3 = 1; 4 = 2; 5 = 3; 6 = 4; 7 = 5; 8 = 6; 12 = 7;'  
data<-data %>%
```

```
  mutate(dbas_2.T2u = dbas2.T2u-1,  
         dbas_3.T2u = dbas3.T2u-1,  
         dbas_4.T2u = dbas4.T2u-1,  
         dbas_5.T2u = dbas5.T2u-1,  
         dbas_6.T2u = dbas6.T2u-1,  
         dbas_7.T2u = dbas7.T2u-1,  
         dbas_8.T2u = dbas8.T2u-1,  
         dbas_9.T2u = dbas9.T2u-1,  
         dbas_10.T2u = dbas10.T2u-1,  
         dbas_11.T2u = dbas11.T2u-1,  
         dbas_12.T2u = dbas12.T2u-1,  
         dbas_13.T2u = dbas13.T2u-1,  
         dbas_14.T2u = dbas14.T2u-1,  
         dbas_15.T2u = dbas15.T2u-1,  
         dbas_16.T2u = dbas16.T2u-1)
```

```
##Rerun descriptives on recoded items
```

```
describe(data$dbas_1.T1)  
describe(data$dbas_2.T1)  
describe(data$dbas_3.T1)  
describe(data$dbas_4.T1)  
describe(data$dbas_5.T1)  
describe(data$dbas_6.T1)  
describe(data$dbas_7.T1)  
describe(data$dbas_8.T1)  
describe(data$dbas_9.T1)  
describe(data$dbas_10.T1)  
describe(data$dbas_11.T1)  
describe(data$dbas_12.T1)  
describe(data$dbas_13.T1)
```

```

describe(data$dbas_14.T1)
describe(data$dbas_15.T1)
describe(data$dbas_16.T1)

describe(data$dbas_1.T2u)
describe(data$dbas_2.T2u)
describe(data$dbas_3.T2u)
describe(data$dbas_4.T2u)
describe(data$dbas_5.T2u)
describe(data$dbas_6.T2u)
describe(data$dbas_7.T2u)
describe(data$dbas_8.T2u)
describe(data$dbas_9.T2u)
describe(data$dbas_10.T2u)
describe(data$dbas_11.T2u)
describe(data$dbas_12.T2u)
describe(data$dbas_13.T2u)
describe(data$dbas_14.T2u)
describe(data$dbas_15.T2u)
describe(data$dbas_16.T2u)

##Calculate Cronbach alpha and compute scale
####Scale score calculated by totaling points
DBAS.T1<- data %>%
  dplyr::select(dbas_1.T1:dbas_16.T1)
ltm::cronbach.alpha(DBAS.T1)

DBAS.T2u<- data %>%
  dplyr::select(dbas_1.T2u:dbas_16.T2u)
ltm::cronbach.alpha(DBAS.T2u, na.rm = TRUE)

rm(DBAS.T1, DBAS.T2u)

data %>%
  dplyr::select(PID.T1, dbas_1.T1:dbas_16.T1) %>%
  mutate(dbas.T1 = dbas_1.T1 + dbas_2.T1 + dbas_3.T1 + dbas_4.T1 + dbas_5.T1 + dbas_6.T1 + dbas_7.T1 + dbas_8.T1 + dbas_9.T1 + dbas_10.T1 + dbas_11.T1 + dbas_12.T1 + dbas_13.T1 + dbas_14.T1 + dbas_15.T1 + dbas_16.T1)
  view()

data<- data %>%
  mutate(dbas.T1 = dbas_1.T1 + dbas_2.T1 + dbas_3.T1 + dbas_4.T1 + dbas_5.T1 + dbas_6.T1 + dbas_7.T1 + dbas_8.T1 + dbas_9.T1 + dbas_10.T1 + dbas_11.T1 + dbas_12.T1 + dbas_13.T1 + dbas_14.T1 + dbas_15.T1 + dbas_16.T1)

data %>%
  dplyr::select(PID.T1, dbas_1.T2u:dbas_16.T2u) %>%
  mutate(dbas.T2u = dbas_1.T2u + dbas_2.T2u + dbas_3.T2u + dbas_4.T2u + dbas_5.T2u + dbas_6.T2u + dbas_7.T2u + dbas_8.T2u + dbas_9.T2u + dbas_10.T2u + dbas_11.T2u + dbas_12.T2u + dbas_13.T2u + dbas_14.T2u + dbas_15.T2u + dbas_16.T2u)
  view()

data<- data %>%
  mutate(dbas.T2u = dbas_1.T2u + dbas_2.T2u + dbas_3.T2u + dbas_4.T2u + dbas_5.T2u + dbas_6.T2u + dbas_7.T2u + dbas_8.T2u + dbas_9.T2u + dbas_10.T2u + dbas_11.T2u + dbas_12.T2u + dbas_13.T2u + dbas_14.T2u + dbas_15.T2u + dbas_16.T2u)
#End DBAS

```

```

#Sleep Locus of Control Scale
##8 items to create 2 subscales - internal locus and external/chance locus
##All positively scored
##Begin Internal Locus of Sleep Control Subscale
###5 items - Qualtrics and manuscript items #1, 2, 5, 7, 8
###Run descriptives on items
describe(data$sloc1.T1)
describe(data$sloc2.T1)
describe(data$sloc5.T1)
describe(data$sloc7.T1)
describe(data$sloc8.T1)

describe(data$sloc1.T2u)
describe(data$sloc2.T2u)
describe(data$sloc5.T2u)
describe(data$sloc7.T2u)
describe(data$sloc8.T2u)

###No recoding necessary - manuscript and Qualtrics scoring match
###Calculate Cronbach alpha and compute subscale
###Scale score calculated by totaling point, per original manuscript.
sloc_int.T1 <-data %>%
  dplyr::select(sloc1.T1, sloc2.T1, sloc5.T1, sloc7.T1, sloc8.T1)
ltm::cronbach.alpha(sloc_int.T1)

sloc_int.T2u <-data %>%
  dplyr::select(sloc1.T2u, sloc2.T2u, sloc5.T2u, sloc7.T2u, sloc8.T2u)
ltm::cronbach.alpha(sloc_int.T2u, na.rm = TRUE)

rm(sloc_int.T1, sloc_int.T2u)

data %>%
  dplyr::select(PID.T1, sloc1.T1, sloc2.T1, sloc5.T1, sloc7.T1, sloc8.T1) %>%
  mutate(sloc_int.T1 = sloc1.T1 + sloc2.T1 + sloc5.T1 + sloc7.T1 + sloc8.T1) %>%
  View()

data <- data %>%
  mutate(sloc_int.T1 = sloc1.T1 + sloc2.T1 + sloc5.T1 + sloc7.T1 + sloc8.T1)

data %>%
  dplyr::select(PID.T1, sloc1.T2u, sloc2.T2u, sloc5.T2u, sloc7.T2u, sloc8.T2u) %>%
  mutate(sloc_int.T2u = sloc1.T2u + sloc2.T2u + sloc5.T2u + sloc7.T2u + sloc8.T2u) %>%
  View()

data <- data %>%
  mutate(sloc_int.T2u = sloc1.T2u + sloc2.T2u + sloc5.T2u + sloc7.T2u + sloc8.T2u)
##End Internal SLOC Subscale

##Begin External/Chance SLOC Subscale
###3 items - manuscript and Qualtrics items #3, 4, 6
###Run descriptives on items

```

```

describe(data$sloc3.T1)
describe(data$sloc4.T1)
describe(data$sloc6.T1)

describe(data$sloc3.T2u)
describe(data$sloc4.T2u)
describe(data$sloc6.T2u)

###No recoding necessary - manuscript and Qualtrics scoring match
###Calculate Cronbach alpha and compute subscale
####Scale score calculated by totaling point, per original manuscript. BeSSI Syntax averaged, not sure
sloc_ext.T1 <-data %>%
  dplyr::select(sloc3.T1, sloc4.T1, sloc6.T1)
ltm::cronbach.alpha(sloc_ext.T1, na.rm = TRUE)

sloc_ext.T2u <-data %>%
  dplyr::select(sloc3.T2u, sloc4.T2u, sloc6.T2u)
ltm::cronbach.alpha(sloc_ext.T2u, na.rm = TRUE)
#poor reliability: alpha = .55

rm(sloc_ext.T1, sloc_ext.T2u)

data %>%
  dplyr::select(PID.T1, sloc3.T1, sloc4.T1, sloc6.T1) %>%
  mutate(sloc_ext.T1 = sloc3.T1 + sloc4.T1 + sloc6.T1) %>%
  View()

data <- data %>%
  mutate(sloc_ext.T1 = sloc3.T1 + sloc4.T1 + sloc6.T1)
#1 NA SLOC_EXT.T1 - missing 1 item

data %>%
  dplyr::select(PID.T1, sloc3.T2u, sloc4.T2u, sloc6.T2u) %>%
  mutate(sloc_ext.T2u = sloc3.T2u + sloc4.T2u + sloc6.T2u) %>%
  View()

data <- data %>%
  mutate(sloc_ext.T2u = sloc3.T2u + sloc4.T2u + sloc6.T2u)
#1 NA SLOC_EXT.T2u - missing 1 item
##End External/Chance SLOC Subscale
#End SLOC Scale

```

Other preliminary efficacy measures

```

#ISI- Insomnia Severity Index - 2
##2 items
##All positively scored
##Run descriptives on items
describe(data$isi_2.T1)
describe(data$isi_3.T1)

describe(data$isi1.T2u)

```

```

describe(data$isi2.T2u)

describe(data$isi1.T2n)
describe(data$isi2.T2n)

##No recoding necessary - scoring in Qualtrics matches original manuscript
##Calculate cronbach alpha
ISI.T1<- data %>%
  dplyr::select(isi_2.T1, isi_3.T1)
ltm::cronbach.alpha(ISI.T1)
#low reliability - alpha = .50

ISI.T2u<- data %>%
  dplyr::select(isi1.T2u, isi2.T2u)
ltm::cronbach.alpha(ISI.T2u, na.rm = TRUE)
#low reliability - alpha = .42

ISI.T2n<- data %>%
  dplyr::select(isi1.T2n, isi2.T2n)
ltm::cronbach.alpha(ISI.T2n, na.rm = TRUE)

rm(ISI.T1, ISI.T2u, ISI.T2n)

##Compute scale
data %>%
  dplyr::select(PID.T1, isi_2.T1, isi_3.T1) %>%
  mutate(isi.T1 = isi_2.T1 + isi_3.T1) %>%
  view()

data<- data %>%
  mutate(isi.T1 = isi_2.T1 + isi_3.T1)

data %>%
  dplyr::select(PID.T1, isi1.T2u, isi2.T2u) %>%
  mutate(isi.T2u = isi1.T2u + isi2.T2u) %>%
  view()

data<- data %>%
  mutate(isi.T2u = isi1.T2u + isi2.T2u)

data %>%
  dplyr::select(PID.T1, isi1.T2n, isi2.T2n) %>%
  mutate(isi.T2n = isi1.T2n + isi2.T2n) %>%
  view()

data<- data %>%
  mutate(isi.T2n = isi1.T2n + isi2.T2n)
#End ISI-2 Scale

```

```

#Sleep Diary Metrics
##SEE SLEEP DIARY SYNTAX FOR COMPUTATION OF SOL, WASO, NO. AWAKENINGS, SLEEP QUALITY, AND TST
#End Sleep Diary Metrics

#PROMIS Global Physical Health 2a
#Internal reliability

promis_ph.T1<- data %>%
  dplyr::select(promis_physhealth1.T1, promis_physhealth2.T1)
ltm::cronbach.alpha(promis_ph.T1)

promis_ph.T2u<- data %>%
  dplyr::select(promis.ph1.T2u, promis.ph2.T2u)
ltm::cronbach.alpha(promis_ph.T2u, na.rm=TRUE)

promis_ph.T2n<- data %>%
  dplyr::select(promis.ph1.T2n, promis.ph2.T2n)
ltm::cronbach.alpha(promis_ph.T2n, na.rm=TRUE)

rm(promis_ph.T1, promis_ph.T2n, promis_ph.T2u)

##2 items, sent to HealthMeasures.net scoring service for scoring - no included syntax
promis_ph.T1<- read.csv("PROMIS Global Physical 2a Scores_T1.csv")
data<- merge(data, promis_ph.T1, by.x = "PID.T1", by.y = "PID.T1", all.x = TRUE)

promis_ph.T2u<- read.csv("PROMIS Global Physical 2a Scores_T2u.csv")
data<- merge(data, promis_ph.T2u, by.x = "PID.T1", by.y = "PID.T1", all.x = TRUE)

promis_ph.T2n<- read.csv("PROMIS Global Physical 2a Scores_T2n.csv")
data<- merge(data, promis_ph.T2n, by.x = "PID.T1", by.y = "PID.T1", all.x = TRUE)

rm(promis_ph.T1, promis_ph.T2u, promis_ph.T2n)
#End PROMIS

#Patient Health Questionnaire (PHQ) - 4 item
##Used 8-item PHQ in BeSSI
##4 items
##All positively scored
## For scores >=3, items 1-2 can suggest anxiety, items 3-4 can suggest depression
##Run descriptives on original items
describe(data$phq4_1.T1)
describe(data$phq4_2.T1)
describe(data$phq4_3.T1)
describe(data$phq4_4.T1)

describe(data$phq1.T2u)
describe(data$phq2.T2u)
describe(data$phq3.T2u)
describe(data$phq4.T2u)

describe(data$phq1.T2n)

```



```

describe(data$phq2.T2n)
describe(data$phq3.T2n)
describe(data$phq4.T2n)

##RECODE: Original manuscript scored items 0-3, Qualtrics scored 1-4
data$phq1.T1<-car::recode(data$phq4_1.T1,'1=0; 2=1; 3=2; 4=3')
data$phq2.T1<-car::recode(data$phq4_2.T1,'1=0; 2=1; 3=2; 4=3')
data$phq3.T1<-car::recode(data$phq4_3.T1,'1=0; 2=1; 3=2; 4=3')
data$phq4.T1<-car::recode(data$phq4_4.T1,'1=0; 2=1; 3=2; 4=3')

data$phq1.T2u<-car::recode(data$phq1.T2u,'1=0; 2=1; 3=2; 4=3')
data$phq2.T2u<-car::recode(data$phq2.T2u,'1=0; 2=1; 3=2; 4=3')
data$phq3.T2u<-car::recode(data$phq3.T2u,'1=0; 2=1; 3=2; 4=3')
data$phq4.T2u<-car::recode(data$phq4.T2u,'1=0; 2=1; 3=2; 4=3')

data$phq1.T2n<-car::recode(data$phq1.T2n,'1=0; 2=1; 3=2; 4=3')
data$phq2.T2n<-car::recode(data$phq2.T2n,'1=0; 2=1; 3=2; 4=3')
data$phq3.T2n<-car::recode(data$phq3.T2n,'1=0; 2=1; 3=2; 4=3')
data$phq4.T2n<-car::recode(data$phq4.T2n,'1=0; 2=1; 3=2; 4=3')

##Rerun descriptives on recoded items
describe(data$phq1.T1)
describe(data$phq2.T1)
describe(data$phq3.T1)
describe(data$phq4.T1)

describe(data$phq1.T2u)
describe(data$phq2.T2u)
describe(data$phq3.T2u)
describe(data$phq4.T2u)

describe(data$phq1.T2n)
describe(data$phq2.T2n)
describe(data$phq3.T2n)
describe(data$phq4.T2n)

##Calculate Cronbach alpha
phq_4.T1 <-data %>%
  dplyr::select(phq1.T1, phq2.T1, phq3.T1, phq4.T1)
ltm::cronbach.alpha(phq_4.T1)

phq_4.T2u <-data %>%
  dplyr::select(phq1.T2u, phq2.T2u, phq3.T2u, phq4.T2u)
ltm::cronbach.alpha(phq_4.T2u, na.rm = TRUE)

phq_4.T2n <-data %>%
  dplyr::select(phq1.T2n, phq2.T2n, phq3.T2n, phq4.T2n)
ltm::cronbach.alpha(phq_4.T2n, na.rm = TRUE)

rm(phq_4.T1, phq_4.T2u, phq_4.T2n)

##Compute PHQ-4 scale and subscales for depression/anxiety

```

```

###Total scale
data %>%
  dplyr::select(PID.T1, phq1.T1, phq2.T1, phq3.T1, phq4.T1) %>%
  mutate(phq_4.T1 = phq1.T1 + phq2.T1 + phq3.T1 + phq4.T1) %>%
  View()

data <- data %>%
  mutate(phq_4.T1 = phq1.T1 + phq2.T1 + phq3.T1 + phq4.T1)

data %>%
  dplyr::select(PID.T1, phq1.T2u, phq2.T2u, phq3.T2u, phq4.T2u) %>%
  mutate(phq_4.T2u = phq1.T2u + phq2.T2u + phq3.T2u + phq4.T2u) %>%
  View()

data <- data %>%
  mutate(phq_4.T2u = phq1.T2u + phq2.T2u + phq3.T2u + phq4.T2u)

data %>%
  dplyr::select(PID.T1, phq1.T2n, phq2.T2n, phq3.T2n, phq4.T2n) %>%
  mutate(phq_4.T2n = phq1.T2n + phq2.T2n + phq3.T2n + phq4.T2n) %>%
  View()

data <- data %>%
  mutate(phq_4.T2n = phq1.T2n + phq2.T2n + phq3.T2n + phq4.T2n)

###Anxiety items
phq.anx.T1 <-data %>%
  dplyr::select(phq1.T1, phq2.T1)
ltm::cronbach.alpha(phq.anx.T1)

phq.anx.T2u <-data %>%
  dplyr::select(phq1.T2u, phq2.T2u)
ltm::cronbach.alpha(phq.anx.T2u, na.rm = TRUE)

phq.anx.T2n <-data %>%
  dplyr::select(phq1.T2n, phq2.T2n)
ltm::cronbach.alpha(phq.anx.T2n, na.rm = TRUE)

rm(phq.anx.T1, phq.anx.T2u, phq.anx.T2n)

data %>%
  dplyr::select(PID.T1, phq1.T1, phq2.T1) %>%
  mutate(phq.anx.T1 = phq1.T1 + phq2.T1) %>%
  View()

data <- data %>%
  mutate(phq.anx.T1 = phq1.T1 + phq2.T1)

```

```

data %>%
  dplyr::select(PID.T1, phq1.T2u, phq2.T2u) %>%
  mutate(phq.anx.T2u = phq1.T2u + phq2.T2u) %>%
  View()

data <- data %>%
  mutate(phq.anx.T2u = phq1.T2u + phq2.T2u)

data %>%
  dplyr::select(PID.T1, phq1.T2n, phq2.T2n) %>%
  mutate(phq.anx.T2n = phq1.T2n + phq2.T2n) %>%
  View()

data <- data %>%
  mutate(phq.anx.T2n = phq1.T2n + phq2.T2n)

###Depression items
phq.dep.T1 <-data %>%
  dplyr::select(phq3.T1, phq4.T1)
ltm::cronbach.alpha(phq.dep.T1)

phq.dep.T2u <-data %>%
  dplyr::select(phq3.T2u, phq4.T2u)
ltm::cronbach.alpha(phq.dep.T2u, na.rm = TRUE)

phq.dep.T2n <-data %>%
  dplyr::select(phq3.T2n, phq4.T2n)
ltm::cronbach.alpha(phq.dep.T2n, na.rm = TRUE)

rm(phq.dep.T1, phq.dep.T2u, phq.dep.T2n)

data %>%
  dplyr::select(PID.T1, phq3.T1, phq4.T1) %>%
  mutate(phq.dep.T1 = phq3.T1 + phq4.T1) %>%
  View()

data <- data %>%
  mutate(phq.dep.T1 = phq3.T1 + phq4.T1)

data %>%
  dplyr::select(PID.T1, phq3.T2u, phq4.T2u) %>%
  mutate(phq.dep.T2u = phq3.T2u + phq4.T2u) %>%
  View()

data <- data %>%
  mutate(phq.dep.T2u = phq3.T2u + phq4.T2u)

data %>%

```

```
dplyr::select(PID.T1, phq3.T2n, phq4.T2n) %>%  
mutate(phq.dep.T2n = phq3.T2n + phq4.T2n) %>%  
View()
```

```
data <- data %>%  
  mutate(phq.dep.T2n = phq3.T2n + phq4.T2n)  
#End PHQ-4 Scale
```

##Add Sleep Diary Outcomes

```
diaryfinal_wide<-read.csv("Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/  
data_all<- merge(data, diaryfinal_wide, by.x = "PID.T1", by.y = "PID", all = TRUE)
```

##Save data

```
#write.csv(data_all, "Z:/Research/Psychiatry and NB Sciences/PSYCH_eHealth/Kelly's Data/00. NCATS/Data
```