

# Final Project

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## Problem 1

### 1.A Load data and prepare data for analysis

```
# Reading in the data

# Predictor
## Basic demographics (age, gender, education)
## Duration of sobriety prior to treatment
raw_demographics <- read_delim("./data/demo.damon.csv", delim = ",")

## Rows: 6038 Columns: 8
## -- Column specification -----
## Delimiter: ","
## chr (4): redcap_event_name, gender, ed_summary, dropout_yn
## dbl (4): record_id, age_today, sobriety_calc, days_in_tx_clean
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.

## Specific SUDs (e.g., alcohol use disorder)
raw_SUD <- read_delim("./data/SUDdiagnosis.damon.csv", delim = ",")

## Rows: 3811 Columns: 15
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (14): record_id, redcap_event_number, admit_num, sa_dx___0, sa_dx___1, s...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.

## Social Support (MSPSS)
raw_social_support <- read_delim("./data/mspss.damon.csv", delim = ",")

## Rows: 6038 Columns: 20
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (19): record_id, redcap_event_number, mspss1, mspss2, mspss3, mspss4, ms...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

### ## Substance Use History

```
raw_sub_history <- read_delim("./data/subuse.damon.csv", delim = ",")
```

```
## Warning: One or more parsing issues, call `problems()` on your data frame for details,  
## e.g.:
```

```
##   dat <- vroom(...)
```

```
##   problems(dat)
```

```
## Rows: 6038 Columns: 16
```

```
## -- Column specification -----
```

```
## Delimiter: ","
```

```
## chr  (1): redcap_event_name
```

```
## dbl (15): record_id, redcap_event_number, newace18a__1, newace18a__2, newa...
```

```
##
```

```
## i Use `spec()` to retrieve the full column specification for this data.
```

```
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

### ## AA/NA Affiliation

```
raw_aana_affiliation <- read_delim("./data/aana.damon.csv", delim = ",")
```

```
## Warning: One or more parsing issues, call `problems()` on your data frame for details,  
## e.g.:
```

```
##   dat <- vroom(...)
```

```
##   problems(dat)
```

```
## Rows: 6038 Columns: 47
```

```
## -- Column specification -----
```

```
## Delimiter: ","
```

```
## chr  (3): redcap_event_name, aai_10, aai_11
```

```
## dbl (43): record_id, aaas_1, aaas_2, aaas_3, aaas_4, aaas_5, aaas_6, aaas_7,...
```

```
## num  (1): aaas_8
```

```
##
```

```
## i Use `spec()` to retrieve the full column specification for this data.
```

```
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

### ## Stressful Life Experiences (LEC-5) lec.damon

```
"
```

```
*The structure of this dataframe is really bonkers. You probably want to use the variable "toyou_total"
```

```
"
```

```
## [1] "\n*The structure of this dataframe is really bonkers. You probably want to use the variable "to
```

```
raw_stressful_life <- read_delim("./data/lec.damon.csv", delim = ",")
```

```
## Rows: 6038 Columns: 109
```

```
## -- Column specification -----
```

```
## Delimiter: ","
```

```
## chr  (1): redcap_event_name
```

```
## dbl (108): record_id, redcap_event_number, currentadmit, lec_2_1__1, lec_2_...
```

```
##
```

```
## i Use `spec()` to retrieve the full column specification for this data.
```

```
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

### ## Spiritual Experiences (Brief R-COPE)

```
raw_spiritual <- read_delim("./data/r_cope.damon.csv", delim = ",")
```

```
## Rows: 6038 Columns: 32
```

```
## -- Column specification -----
```

```

## Delimiter: ","
## chr (2): redcap_event_name, brc_rel_other
## dbl (30): record_id, redcap_event_number, brc1, brc2, brc3, brc4, brc5, brc6...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
# Things to predict
## Quality of Life (WHOQOL-BREF): Evaluates general, physical, psychological health, social relationships
raw_life_quality <- read_delim("./data/QOL.damon.csv", delim = ",")

## Rows: 6038 Columns: 39
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (38): record_id, redcap_event_number, who_1, who_2, who_3, who_4, who_5,...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## raw_life_quality <- read_delim("./data/QOL.damon.csv", delim = ",")
raw_commitment <- read_delim("./data/change.damon.csv", delim = ",")

## Rows: 6038 Columns: 9
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (8): record_id, redcap_event_number, change_1, change_2, change_3, change_4,...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Alcohol/Drug Craving (PACS): Measures the frequency and intensity of cravings.
raw_craving <- read_delim("./data/craving.damon.csv", delim = ",")

## Rows: 6038 Columns: 64
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (63): record_id, redcap_event_number, dase1, dase2, dase3, dase4, dase5,...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## Treatment dropout
## demo.damon (dropout_yn)
## Length of stay in treatment
## demo.damon (days_in_tx_clean)
## Impression of Change (PGIC)
raw_change_impression <- read_delim("./data/pgic.damon.csv", delim = ",")

## Rows: 6038 Columns: 3
## -- Column specification -----
## Delimiter: ","
## chr (1): redcap_event_name
## dbl (2): record_id, patient_impression_change
##

```

```
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
# Other
```

```
raw_data_dictionary <- read_delim("./data/Data Dictionary.csv", delim = ",")
```

```
## Rows: 1124 Columns: 18
```

```
## -- Column specification -----
```

```
## Delimiter: ","
```

```
## chr (15): Variable / Field Name, Form Name, Section Header, Field Type, Fiel...
```

```
## lgl (3): Text Validation Min, Text Validation Max, Matrix Ranking?
```

```
##
```

```
## i Use `spec()` to retrieve the full column specification for this data.
```

```
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
# Demographics
```

```
# Missing
```

```
## Childhood Experiences (ACE)
```

```
## aces.damon is missing
```

```
str(raw_demographics)
```

```
## spc_tbl_ [6,038 x 8] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
```

```
## $ record_id : num [1:6038] 1 1 2 2 3 4 4 4 5 ...
```

```
## $ redcap_event_name: chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1"
```

```
## $ age_today : num [1:6038] 27 28 41 41 23 62 64 NA NA 57 ...
```

```
## $ gender : chr [1:6038] "men" "men" "men" "men" ...
```

```
## $ ed_summary : chr [1:6038] "High School/GED or less" "High School/GED or less" "Bachelor's"
```

```
## $ sobriety_calc : num [1:6038] 20 3 14 1 24 1 6 NA NA 4 ...
```

```
## $ days_in_tx_clean : num [1:6038] 54 2 48 91 111 104 45 45 45 56 ...
```

```
## $ dropout_yn : chr [1:6038] "yes" "yes" "no" "no" ...
```

```
## - attr(*, "spec")=
```

```
## .. cols(
```

```
## .. record_id = col_double(),
```

```
## .. redcap_event_name = col_character(),
```

```
## .. age_today = col_double(),
```

```
## .. gender = col_character(),
```

```
## .. ed_summary = col_character(),
```

```
## .. sobriety_calc = col_double(),
```

```
## .. days_in_tx_clean = col_double(),
```

```
## .. dropout_yn = col_character()
```

```
## .. )
```

```
## - attr(*, "problems")=<externalptr>
```

```
str(raw_SUD)
```

```
## spc_tbl_ [3,811 x 15] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
```

```
## $ record_id : num [1:3811] 1 1 2 2 3 4 4 4 5 ...
```

```
## $ redcap_event_name : chr [1:3811] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1"
```

```
## $ redcap_event_number: num [1:3811] 0 0 0 0 0 0 0 1 2 0 ...
```

```
## $ admit_num : num [1:3811] 1 2 1 2 1 1 2 2 2 1 ...
```

```
## $ sa_dx__0 : num [1:3811] 0 0 0 1 0 0 1 1 1 1 ...
```

```
## $ sa_dx__1 : num [1:3811] 0 1 1 1 1 0 0 0 0 0 ...
```

```
## $ sa_dx__2 : num [1:3811] 1 1 0 0 1 0 0 0 0 0 ...
```

```
## $ sa_dx__3 : num [1:3811] 0 0 1 1 1 1 1 1 1 0 ...
```

```
## $ sa_dx__4 : num [1:3811] 0 0 0 0 0 0 0 0 0 0 ...
```

```
## $ sa_dx___5      : num [1:3811] 1 1 1 1 0 0 0 0 0 0 ...
## $ sa_dx___6      : num [1:3811] 0 0 0 0 0 0 0 0 0 0 ...
## $ sa_dx___7      : num [1:3811] 1 1 0 0 0 0 0 0 0 0 ...
## $ sa_dx___8      : num [1:3811] 0 0 0 0 0 0 0 0 0 1 ...
## $ sa_dx___9      : num [1:3811] 0 0 0 0 0 0 0 0 0 0 ...
## $ sa_dx_sum      : num [1:3811] 3 4 3 4 3 1 2 2 2 2 ...
## - attr(*, "spec")=
## .. cols(
## ..   record_id = col_double(),
## ..   redcap_event_name = col_character(),
## ..   redcap_event_number = col_double(),
## ..   admit_num = col_double(),
## ..   sa_dx___0 = col_double(),
## ..   sa_dx___1 = col_double(),
## ..   sa_dx___2 = col_double(),
## ..   sa_dx___3 = col_double(),
## ..   sa_dx___4 = col_double(),
## ..   sa_dx___5 = col_double(),
## ..   sa_dx___6 = col_double(),
## ..   sa_dx___7 = col_double(),
## ..   sa_dx___8 = col_double(),
## ..   sa_dx___9 = col_double(),
## ..   sa_dx_sum = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_social_support)
```

```
## spc_tbl_ [6,038 x 20] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id      : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaselin
## $ redcap_event_number : num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ mspss1         : num [1:6038] 1 2 1 2 6 7 7 7 7 1 ...
## $ mspss2         : num [1:6038] 2 1 7 2 7 7 7 7 7 3 ...
## $ mspss3         : num [1:6038] 3 4 7 7 7 5 6 6 6 7 ...
## $ mspss4         : num [1:6038] 2 2 5 4 7 5 5 5 6 7 ...
## $ mspss5         : num [1:6038] 1 1 7 2 7 7 6 7 6 5 ...
## $ mspss6         : num [1:6038] 2 3 1 7 5 7 6 6 6 2 ...
## $ mspss7         : num [1:6038] 2 1 1 7 5 7 6 6 6 2 ...
## $ mspss8         : num [1:6038] 2 1 6 1 6 2 6 5 6 7 ...
## $ mspss9         : num [1:6038] 2 4 1 5 6 7 6 5 6 2 ...
## $ mspss10        : num [1:6038] 1 1 7 2 7 7 6 6 6 5 ...
## $ mspss11        : num [1:6038] 2 5 7 4 7 3 6 6 6 7 ...
## $ mspss12        : num [1:6038] 2 6 1 5 5 7 6 6 6 3 ...
## $ mspss_fam_sub_total : num [1:6038] 2.25 3 6.25 4 6.75 3.75 5.75 5.5 6 7 ...
## $ mspss_friends_sub_total : num [1:6038] 2 3.5 1 6 5.25 7 6 5.75 6 2.25 ...
## $ mspss_sig_other_sub_total: num [1:6038] 1.25 1.25 5.5 2 6.75 7 6.5 6.75 6.5 3.5 ...
## $ mspss_total      : num [1:6038] 1.83 2.58 4.25 4 6.25 5.92 6.08 6 6.17 4.25 ...
## $ mspss_fam_friends_tot : num [1:6038] 4.25 6.5 7.25 10 12 ...
## - attr(*, "spec")=
## .. cols(
## ..   record_id = col_double(),
## ..   redcap_event_name = col_character(),
## ..   redcap_event_number = col_double(),
## ..   mspss1 = col_double(),
```

```

## .. mspss2 = col_double(),
## .. mspss3 = col_double(),
## .. mspss4 = col_double(),
## .. mspss5 = col_double(),
## .. mspss6 = col_double(),
## .. mspss7 = col_double(),
## .. mspss8 = col_double(),
## .. mspss9 = col_double(),
## .. mspss10 = col_double(),
## .. mspss11 = col_double(),
## .. mspss12 = col_double(),
## .. mspss_fam_sub_total = col_double(),
## .. mspss_friends_sub_total = col_double(),
## .. mspss_sig_other_sub_total = col_double(),
## .. mspss_total = col_double(),
## .. mspss_fam_friends_tot = col_double()
## .. )
## - attr(*, "problems")=<externalptr>

str(raw_sub_history)

## spc_tbl_ [6,038 x 16] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1" ...
## $ redcap_event_number: num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ newace18a___1 : num [1:6038] 1 1 0 0 0 1 1 NA NA 1 ...
## $ newace18a___2 : num [1:6038] 1 1 0 0 1 1 1 NA NA 1 ...
## $ newace18a___10 : num [1:6038] 1 1 0 0 1 1 1 NA NA 0 ...
## $ newace18b : num [1:6038] 18 18 NA NA NA 14 14 NA NA NA ...
## $ newace18c : num [1:6038] 21 21 NA NA 15 14 14 NA NA 19 ...
## $ newace18d : num [1:6038] 14 14 NA NA 14 14 14 NA NA NA ...
## $ gateway_1 : num [1:6038] 1 1 NA NA NA 1 1 NA NA NA ...
## $ newace19a___1 : num [1:6038] 1 1 0 0 0 1 1 NA NA 1 ...
## $ newace19a___2 : num [1:6038] 1 1 0 0 1 1 1 NA NA 1 ...
## $ newace19a___10 : num [1:6038] 1 1 0 0 1 1 1 NA NA 0 ...
## $ newace19b : num [1:6038] 18 18 NA NA NA 14 14 NA NA 23 ...
## $ newace19c : num [1:6038] 21 21 NA NA 15 16 16 NA NA 49 ...
## $ newace19d : num [1:6038] 14 14 NA NA 14 16 16 NA NA NA ...
## - attr(*, "spec")=
## .. cols(
## .. record_id = col_double(),
## .. redcap_event_name = col_character(),
## .. redcap_event_number = col_double(),
## .. newace18a___1 = col_double(),
## .. newace18a___2 = col_double(),
## .. newace18a___10 = col_double(),
## .. newace18b = col_double(),
## .. newace18c = col_double(),
## .. newace18d = col_double(),
## .. gateway_1 = col_double(),
## .. newace19a___1 = col_double(),
## .. newace19a___2 = col_double(),
## .. newace19a___10 = col_double(),
## .. newace19b = col_double(),
## .. newace19c = col_double(),

```

```
## .. newace19d = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_aana_affiliation)
```

```
## spc_tbl_ [6,038 x 47] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id      : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1" ...
## $ aaas_1          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_2          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_3          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_4          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_5          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_6          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_7          : num [1:6038] NA NA NA NA NA NA 1 NA NA NA ...
## $ aaas_8          : num [1:6038] NA NA NA NA NA NA 3900 NA NA NA ...
## $ aaas_9          : num [1:6038] NA NA NA NA NA NA 160 NA NA NA ...
## $ aaas_special     : num [1:6038] NA NA NA NA NA NA NA NA NA NA ...
## $ aaas_calc_lifetime : num [1:6038] 0 0 0 0 0 0 1 NA NA 0 ...
## $ aaas_calc_past_year : num [1:6038] 0 0 0 0 0 0 0.75 NA NA 0 ...
## $ aaas_total        : num [1:6038] 0 0 0 0 0 0 8.75 NA NA 0 ...
## $ aai_1            : num [1:6038] 1 NA 1 1 1 1 NA NA NA 1 ...
## $ aai_2            : num [1:6038] 1 NA 1 1 1 1 NA NA NA 1 ...
## $ aai_3            : num [1:6038] 0 NA 1 1 1 1 NA NA NA 0 ...
## $ aai_4            : num [1:6038] 0 NA 1 1 1 1 NA NA NA 0 ...
## $ aai_5            : num [1:6038] 0 NA 1 1 0 1 NA NA NA 0 ...
## $ aai_6            : num [1:6038] 1 NA 1 1 1 1 NA NA NA 1 ...
## $ aai_7            : num [1:6038] 0 NA 1 1 0 1 NA NA NA 0 ...
## $ aai_8            : num [1:6038] 1 NA 0 4 8 12 NA NA NA 2 ...
## $ aai_9            : num [1:6038] 1 NA 12 12 8 12 NA NA NA 2 ...
## $ aai_10           : chr [1:6038] "15" NA "40" "120" ...
## $ aai_11           : chr [1:6038] "100" NA "1000" "700" ...
## $ aai_12           : num [1:6038] 0 NA 1 1 1 1 NA NA NA 0 ...
## $ aai_attend_sub    : num [1:6038] 3.26 2.04 4.71 4.87 4.59 ...
## $ aai_involve_sub   : num [1:6038] 1.81 1.36 4.65 4.71 3.54 ...
## $ tspe_1           : num [1:6038] 3 5 4 6 6 6 6 6 6 6 ...
## $ tspe_2           : num [1:6038] 4 5 1 6 5 6 6 6 6 6 ...
## $ tspe_3           : num [1:6038] 5 4 4 6 6 6 6 6 6 6 ...
## $ tspe_4           : num [1:6038] 4 5 4 6 6 6 6 6 6 6 ...
## $ tspe_5           : num [1:6038] 4 3 1 5 5 6 6 6 6 6 ...
## $ tspe_6           : num [1:6038] 4 5 6 6 5 6 6 6 6 6 ...
## $ tspe_7           : num [1:6038] 6 6 6 4 3 1 1 1 1 2 ...
## $ tspe_8           : num [1:6038] 2 1 1 5 2 1 1 1 1 1 ...
## $ tspe_9           : num [1:6038] 2 1 1 1 2 1 1 1 1 1 ...
## $ tspe_10          : num [1:6038] 2 1 1 1 2 1 1 1 1 1 ...
## $ tspe_11          : num [1:6038] 4 2 6 6 2 1 1 1 1 2 ...
## $ tspe_12          : num [1:6038] 2 2 1 1 2 1 1 1 1 1 ...
## $ tspe_13          : num [1:6038] 2 2 1 3 2 1 1 5 5 1 ...
## $ tspe_14          : num [1:6038] 1 2 1 1 1 1 1 1 1 2 ...
## $ tspe_15          : num [1:6038] 1 1 1 1 1 1 2 1 1 1 ...
## $ tpse_16          : num [1:6038] 1 1 2 4 2 1 1 1 1 1 ...
## $ tspe_positive     : num [1:6038] 24 27 20 35 33 36 36 36 36 ...
## $ tspe_negative     : num [1:6038] 23 19 21 27 19 10 11 14 14 13 ...
## - attr(*, "spec")=
```

```
## .. cols(
## ..   record_id = col_double(),
## ..   redcap_event_name = col_character(),
## ..   aaas_1 = col_double(),
## ..   aaas_2 = col_double(),
## ..   aaas_3 = col_double(),
## ..   aaas_4 = col_double(),
## ..   aaas_5 = col_double(),
## ..   aaas_6 = col_double(),
## ..   aaas_7 = col_double(),
## ..   aaas_8 = col_number(),
## ..   aaas_9 = col_double(),
## ..   aaas_special = col_double(),
## ..   aaas_calc_lifetime = col_double(),
## ..   aaas_calc_past_year = col_double(),
## ..   aaas_total = col_double(),
## ..   aai_1 = col_double(),
## ..   aai_2 = col_double(),
## ..   aai_3 = col_double(),
## ..   aai_4 = col_double(),
## ..   aai_5 = col_double(),
## ..   aai_6 = col_double(),
## ..   aai_7 = col_double(),
## ..   aai_8 = col_double(),
## ..   aai_9 = col_double(),
## ..   aai_10 = col_character(),
## ..   aai_11 = col_character(),
## ..   aai_12 = col_double(),
## ..   aai_attend_sub = col_double(),
## ..   aai_involve_sub = col_double(),
## ..   tspe_1 = col_double(),
## ..   tspe_2 = col_double(),
## ..   tspe_3 = col_double(),
## ..   tspe_4 = col_double(),
## ..   tspe_5 = col_double(),
## ..   tspe_6 = col_double(),
## ..   tspe_7 = col_double(),
## ..   tspe_8 = col_double(),
## ..   tspe_9 = col_double(),
## ..   tspe_10 = col_double(),
## ..   tspe_11 = col_double(),
## ..   tspe_12 = col_double(),
## ..   tspe_13 = col_double(),
## ..   tspe_14 = col_double(),
## ..   tspe_15 = col_double(),
## ..   tpse_16 = col_double(),
## ..   tspe_positive = col_double(),
## ..   tspe_negative = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_stressful_life)
```

```
## spc_tbl_ [6,038 x 109] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id      : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
```



```

## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1"
## $ redcap_event_number: num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ currentadmit : num [1:6038] 1 2 1 2 1 1 2 2 2 1 ...
## $ lec_2_1___1 : num [1:6038] 0 1 1 1 0 0 0 NA NA 0 ...
## $ lec_2_1___2 : num [1:6038] 1 0 0 1 1 1 0 NA NA 0 ...
## $ lec_2_1___3 : num [1:6038] 0 0 0 0 1 1 1 NA NA 1 ...
## $ lec_2_1___4 : num [1:6038] 0 0 0 0 0 1 0 NA NA 0 ...
## $ lec_2_1___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_1___6 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_2___1 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_2___2 : num [1:6038] 1 0 0 0 1 0 0 NA NA 0 ...
## $ lec_2_2___3 : num [1:6038] 0 0 0 0 0 0 0 NA NA 1 ...
## $ lec_2_2___4 : num [1:6038] 0 0 1 0 0 0 0 NA NA 0 ...
## $ lec_2_2___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_2___6 : num [1:6038] 0 1 0 1 0 1 1 NA NA 0 ...
## $ lec_2_3___1 : num [1:6038] 1 0 0 0 1 1 0 NA NA 0 ...
## $ lec_2_3___2 : num [1:6038] 1 1 0 0 0 1 0 NA NA 0 ...
## $ lec_2_3___3 : num [1:6038] 0 0 0 0 0 1 0 NA NA 0 ...
## $ lec_2_3___4 : num [1:6038] 0 0 1 0 0 1 1 NA NA 0 ...
## $ lec_2_3___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_3___6 : num [1:6038] 1 0 0 1 0 0 0 NA NA 1 ...
## $ lec_2_4___1 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_4___2 : num [1:6038] 0 0 0 0 0 1 0 NA NA 0 ...
## $ lec_2_4___3 : num [1:6038] 0 0 0 0 0 0 1 NA NA 0 ...
## $ lec_2_4___4 : num [1:6038] 0 0 1 0 0 1 0 NA NA 0 ...
## $ lec_2_4___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_4___6 : num [1:6038] 1 1 0 1 1 0 0 NA NA 1 ...
## $ lec_2_5___1 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_5___2 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_5___3 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_5___4 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_5___5 : num [1:6038] 0 0 0 0 1 0 0 NA NA 0 ...
## $ lec_2_5___6 : num [1:6038] 1 1 1 1 0 1 1 NA NA 1 ...
## $ lec_2_6___1 : num [1:6038] 0 1 1 1 1 0 0 NA NA 0 ...
## $ lec_2_6___2 : num [1:6038] 0 0 0 1 1 0 0 NA NA 0 ...
## $ lec_2_6___3 : num [1:6038] 0 0 0 0 1 0 0 NA NA 0 ...
## $ lec_2_6___4 : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_6___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_6___6 : num [1:6038] 1 0 0 0 0 1 1 NA NA 1 ...
## $ lec_2_7___1 : num [1:6038] 0 0 0 0 1 0 0 NA NA 0 ...
## $ lec_2_7___2 : num [1:6038] 0 1 0 0 1 1 0 NA NA 0 ...
## $ lec_2_7___3 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_7___4 : num [1:6038] 0 0 1 1 0 0 0 NA NA 0 ...
## $ lec_2_7___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_7___6 : num [1:6038] 1 0 0 0 0 0 1 NA NA 1 ...
## $ lec_2_8___1 : num [1:6038] 0 0 1 1 1 0 0 NA NA 0 ...
## $ lec_2_8___2 : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_8___3 : num [1:6038] 0 0 0 0 0 0 0 NA NA 1 ...
## $ lec_2_8___4 : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_8___5 : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_8___6 : num [1:6038] 1 1 0 0 0 1 1 NA NA 0 ...
## $ lec_2_9___1 : num [1:6038] 0 0 1 1 1 0 0 NA NA 0 ...
## $ lec_2_9___2 : num [1:6038] 0 0 0 1 1 0 0 NA NA 0 ...
## $ lec_2_9___3 : num [1:6038] 0 0 0 0 0 0 0 NA NA 1 ...

```

```

## $ lec_2_9___4      : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_9___5      : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_9___6      : num [1:6038] 1 1 0 0 0 1 1 NA NA 0 ...
## $ lec_2_10___1     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_10___2     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_10___3     : num [1:6038] 0 0 0 0 0 0 1 NA NA 0 ...
## $ lec_2_10___4     : num [1:6038] 0 0 1 0 0 0 0 NA NA 0 ...
## $ lec_2_10___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_10___6     : num [1:6038] 1 1 0 1 1 1 0 NA NA 1 ...
## $ lec_2_11___1     : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_11___2     : num [1:6038] 0 0 0 1 0 0 0 NA NA 0 ...
## $ lec_2_11___3     : num [1:6038] 0 0 0 0 0 0 1 NA NA 0 ...
## $ lec_2_11___4     : num [1:6038] 0 0 1 0 0 0 0 NA NA 0 ...
## $ lec_2_11___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_11___6     : num [1:6038] 1 1 0 0 1 1 0 NA NA 1 ...
## $ lec_2_12___1     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_12___2     : num [1:6038] 0 1 0 0 0 1 0 NA NA 0 ...
## $ lec_2_12___3     : num [1:6038] 0 0 0 0 0 1 0 NA NA 0 ...
## $ lec_2_12___4     : num [1:6038] 0 0 1 0 0 1 1 NA NA 0 ...
## $ lec_2_12___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_12___6     : num [1:6038] 0 0 0 1 1 0 0 NA NA 1 ...
## $ lec_2_13___1     : num [1:6038] 0 1 1 1 0 0 0 NA NA 0 ...
## $ lec_2_13___2     : num [1:6038] 0 0 0 1 0 1 0 NA NA 0 ...
## $ lec_2_13___3     : num [1:6038] 0 0 0 0 0 1 0 NA NA 0 ...
## $ lec_2_13___4     : num [1:6038] 0 0 1 1 0 1 1 NA NA 0 ...
## $ lec_2_13___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_13___6     : num [1:6038] 1 0 0 0 1 0 0 NA NA 1 ...
## $ lec_2_14___1     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_14___2     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_14___3     : num [1:6038] 0 0 0 0 1 1 0 NA NA 0 ...
## $ lec_2_14___4     : num [1:6038] 0 0 1 0 0 1 1 NA NA 0 ...
## $ lec_2_14___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_14___6     : num [1:6038] 1 1 0 1 0 0 0 NA NA 1 ...
## $ lec_2_15___1     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_15___2     : num [1:6038] 0 1 0 0 0 1 0 NA NA 0 ...
## $ lec_2_15___3     : num [1:6038] 0 0 0 0 0 0 0 NA NA 1 ...
## $ lec_2_15___4     : num [1:6038] 0 0 1 0 0 1 0 NA NA 0 ...
## $ lec_2_15___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_15___6     : num [1:6038] 1 0 0 1 1 0 1 NA NA 0 ...
## $ lec_2_16___1     : num [1:6038] 0 0 0 0 1 0 0 NA NA 0 ...
## $ lec_2_16___2     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_16___3     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_16___4     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## $ lec_2_16___5     : num [1:6038] 0 0 0 0 0 0 0 NA NA 0 ...
## [list output truncated]
## - attr(*, "spec")=
## .. cols(
## ..   record_id = col_double(),
## ..   redcap_event_name = col_character(),
## ..   redcap_event_number = col_double(),
## ..   currentadmit = col_double(),
## ..   lec_2_1___1 = col_double(),
## ..   lec_2_1___2 = col_double(),
## ..   lec_2_1___3 = col_double(),

```

```

## .. lec_2_1___4 = col_double(),
## .. lec_2_1___5 = col_double(),
## .. lec_2_1___6 = col_double(),
## .. lec_2_2___1 = col_double(),
## .. lec_2_2___2 = col_double(),
## .. lec_2_2___3 = col_double(),
## .. lec_2_2___4 = col_double(),
## .. lec_2_2___5 = col_double(),
## .. lec_2_2___6 = col_double(),
## .. lec_2_3___1 = col_double(),
## .. lec_2_3___2 = col_double(),
## .. lec_2_3___3 = col_double(),
## .. lec_2_3___4 = col_double(),
## .. lec_2_3___5 = col_double(),
## .. lec_2_3___6 = col_double(),
## .. lec_2_4___1 = col_double(),
## .. lec_2_4___2 = col_double(),
## .. lec_2_4___3 = col_double(),
## .. lec_2_4___4 = col_double(),
## .. lec_2_4___5 = col_double(),
## .. lec_2_4___6 = col_double(),
## .. lec_2_5___1 = col_double(),
## .. lec_2_5___2 = col_double(),
## .. lec_2_5___3 = col_double(),
## .. lec_2_5___4 = col_double(),
## .. lec_2_5___5 = col_double(),
## .. lec_2_5___6 = col_double(),
## .. lec_2_6___1 = col_double(),
## .. lec_2_6___2 = col_double(),
## .. lec_2_6___3 = col_double(),
## .. lec_2_6___4 = col_double(),
## .. lec_2_6___5 = col_double(),
## .. lec_2_6___6 = col_double(),
## .. lec_2_7___1 = col_double(),
## .. lec_2_7___2 = col_double(),
## .. lec_2_7___3 = col_double(),
## .. lec_2_7___4 = col_double(),
## .. lec_2_7___5 = col_double(),
## .. lec_2_7___6 = col_double(),
## .. lec_2_8___1 = col_double(),
## .. lec_2_8___2 = col_double(),
## .. lec_2_8___3 = col_double(),
## .. lec_2_8___4 = col_double(),
## .. lec_2_8___5 = col_double(),
## .. lec_2_8___6 = col_double(),
## .. lec_2_9___1 = col_double(),
## .. lec_2_9___2 = col_double(),
## .. lec_2_9___3 = col_double(),
## .. lec_2_9___4 = col_double(),
## .. lec_2_9___5 = col_double(),
## .. lec_2_9___6 = col_double(),
## .. lec_2_10___1 = col_double(),
## .. lec_2_10___2 = col_double(),
## .. lec_2_10___3 = col_double(),

```

```

## .. lec_2_10___4 = col_double(),
## .. lec_2_10___5 = col_double(),
## .. lec_2_10___6 = col_double(),
## .. lec_2_11___1 = col_double(),
## .. lec_2_11___2 = col_double(),
## .. lec_2_11___3 = col_double(),
## .. lec_2_11___4 = col_double(),
## .. lec_2_11___5 = col_double(),
## .. lec_2_11___6 = col_double(),
## .. lec_2_12___1 = col_double(),
## .. lec_2_12___2 = col_double(),
## .. lec_2_12___3 = col_double(),
## .. lec_2_12___4 = col_double(),
## .. lec_2_12___5 = col_double(),
## .. lec_2_12___6 = col_double(),
## .. lec_2_13___1 = col_double(),
## .. lec_2_13___2 = col_double(),
## .. lec_2_13___3 = col_double(),
## .. lec_2_13___4 = col_double(),
## .. lec_2_13___5 = col_double(),
## .. lec_2_13___6 = col_double(),
## .. lec_2_14___1 = col_double(),
## .. lec_2_14___2 = col_double(),
## .. lec_2_14___3 = col_double(),
## .. lec_2_14___4 = col_double(),
## .. lec_2_14___5 = col_double(),
## .. lec_2_14___6 = col_double(),
## .. lec_2_15___1 = col_double(),
## .. lec_2_15___2 = col_double(),
## .. lec_2_15___3 = col_double(),
## .. lec_2_15___4 = col_double(),
## .. lec_2_15___5 = col_double(),
## .. lec_2_15___6 = col_double(),
## .. lec_2_16___1 = col_double(),
## .. lec_2_16___2 = col_double(),
## .. lec_2_16___3 = col_double(),
## .. lec_2_16___4 = col_double(),
## .. lec_2_16___5 = col_double(),
## .. lec_2_16___6 = col_double(),
## .. lec_2_17___1 = col_double(),
## .. lec_2_17___2 = col_double(),
## .. lec_2_17___3 = col_double(),
## .. lec_2_17___4 = col_double(),
## .. lec_2_17___5 = col_double(),
## .. lec_2_17___6 = col_double(),
## .. toyou_total = col_double(),
## .. witnessed_total = col_double(),
## .. toyou_wit_total = col_double()
## .. )
## - attr(*, "problems")=<externalptr>

```

```
str(raw_spiritual)
```

```

## spc_tbl_ [6,038 x 32] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id      : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...

```

```

## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1"
## $ redcap_event_number: num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ brc1 : num [1:6038] 3 3 3 3 3 1 3 2 3 3 ...
## $ brc2 : num [1:6038] 3 3 3 3 3 1 3 3 3 3 ...
## $ brc3 : num [1:6038] 3 3 3 3 3 1 2 2 3 2 ...
## $ brc4 : num [1:6038] 3 3 3 3 3 1 2 3 3 2 ...
## $ brc5 : num [1:6038] 3 3 3 3 3 1 2 3 3 3 ...
## $ brc6 : num [1:6038] 3 3 3 3 2 0 2 0 3 3 ...
## $ brc7 : num [1:6038] 2 3 3 3 1 0 0 0 3 0 ...
## $ brc8 : num [1:6038] 0 0 3 2 0 0 0 0 0 0 ...
## $ brc9 : num [1:6038] 0 0 3 0 0 0 0 0 0 0 ...
## $ brc10 : num [1:6038] 0 0 3 1 0 0 0 0 0 0 ...
## $ brc11 : num [1:6038] 0 0 3 1 1 0 0 0 0 1 ...
## $ brc12 : num [1:6038] 2 0 2 0 0 0 0 0 0 0 ...
## $ brc13 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc14 : num [1:6038] 0 0 0 0 1 0 0 0 0 0 ...
## $ brc_rel___0 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___1 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___2 : num [1:6038] 0 0 0 0 0 1 1 1 1 0 ...
## $ brc_rel___3 : num [1:6038] 1 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___4 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___5 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___6 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___7 : num [1:6038] 0 0 0 0 1 0 0 0 0 0 ...
## $ brc_rel___8 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___9 : num [1:6038] 0 0 0 0 0 0 0 0 0 0 ...
## $ brc_rel___10 : num [1:6038] 0 1 1 0 1 0 0 0 0 1 ...
## $ brc_rel___15 : num [1:6038] 0 0 0 1 1 0 0 0 0 0 ...
## $ brc_rel_other : chr [1:6038] NA NA NA "Anglican" ...
## $ pos_cope : num [1:6038] 20 21 21 21 18 5 14 13 21 16 ...
## $ neg_cope : num [1:6038] 2 0 14 4 2 0 0 0 0 1 ...
## - attr(*, "spec")=
## .. cols(
## .. record_id = col_double(),
## .. redcap_event_name = col_character(),
## .. redcap_event_number = col_double(),
## .. brc1 = col_double(),
## .. brc2 = col_double(),
## .. brc3 = col_double(),
## .. brc4 = col_double(),
## .. brc5 = col_double(),
## .. brc6 = col_double(),
## .. brc7 = col_double(),
## .. brc8 = col_double(),
## .. brc9 = col_double(),
## .. brc10 = col_double(),
## .. brc11 = col_double(),
## .. brc12 = col_double(),
## .. brc13 = col_double(),
## .. brc14 = col_double(),
## .. brc_rel___0 = col_double(),
## .. brc_rel___1 = col_double(),
## .. brc_rel___2 = col_double(),
## .. brc_rel___3 = col_double(),

```

```
## .. brc_rel___4 = col_double(),
## .. brc_rel___5 = col_double(),
## .. brc_rel___6 = col_double(),
## .. brc_rel___7 = col_double(),
## .. brc_rel___8 = col_double(),
## .. brc_rel___9 = col_double(),
## .. brc_rel___10 = col_double(),
## .. brc_rel___15 = col_double(),
## .. brc_rel_other = col_character(),
## .. pos_cope = col_double(),
## .. neg_cope = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_life_quality)
```

```
## spc_tbl_ [6,038 x 39] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
```

```
## $ record_id      : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1"
## $ redcap_event_number: num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ who_1          : num [1:6038] 3 4 3 1 4 1 4 4 5 3 ...
## $ who_2          : num [1:6038] 4 3 2 1 2 2 2 4 5 2 ...
## $ who_3          : num [1:6038] 5 5 4 5 3 1 2 3 3 1 ...
## $ who_4          : num [1:6038] 4 2 5 5 4 1 3 4 5 3 ...
## $ who_5          : num [1:6038] 4 3 3 2 4 2 2 4 4 4 ...
## $ who_6          : num [1:6038] 5 5 3 2 5 4 2 4 5 2 ...
## $ who_7          : num [1:6038] 3 1 3 5 3 4 3 4 5 5 ...
## $ who_8          : num [1:6038] 4 3 5 5 4 3 3 5 5 5 ...
## $ who_9          : num [1:6038] 4 3 3 4 4 3 4 5 5 5 ...
## $ who_10         : num [1:6038] 5 5 2 1 4 3 2 4 4 3 ...
## $ who_11         : num [1:6038] 4 5 4 2 4 5 4 4 4 5 ...
## $ who_12         : num [1:6038] 4 4 1 1 4 5 4 3 3 5 ...
## $ who_13         : num [1:6038] 4 4 2 4 4 5 4 4 5 5 ...
## $ who_14         : num [1:6038] 3 5 3 3 3 4 2 5 5 3 ...
## $ who_15         : num [1:6038] 4 4 4 5 5 5 3 5 5 3 ...
## $ who_16         : num [1:6038] 2 4 1 1 4 1 1 2 4 2 ...
## $ who_17         : num [1:6038] 4 4 3 2 3 2 5 5 5 2 ...
## $ who_18         : num [1:6038] 5 4 4 1 3 5 4 5 5 2 ...
## $ who_19         : num [1:6038] 4 4 3 1 4 5 2 4 5 3 ...
## $ who_20         : num [1:6038] 2 3 1 1 4 5 4 2 2 4 ...
## $ who_21         : num [1:6038] 4 4 1 1 5 1 4 3 2 1 ...
## $ who_22         : num [1:6038] 2 4 1 2 3 5 4 4 4 3 ...
## $ who_23         : num [1:6038] 3 3 2 1 4 2 4 5 5 5 ...
## $ who_24         : num [1:6038] 4 5 2 4 4 5 5 5 5 4 ...
## $ who_25         : num [1:6038] 5 5 1 1 4 5 5 5 5 1 ...
## $ who_26         : num [1:6038] 3 3 4 2 4 2 2 4 4 4 ...
## $ who_qol_gh_total : num [1:6038] 7 7 5 2 6 3 6 8 10 5 ...
## $ trans_phys_hlth : num [1:6038] 17 16 13 11 15 10 11 16 18 9 ...
## $ trans_psych_health : num [1:6038] 15 14 13 9 16 15 10 16 18 15 ...
## $ trans_soc_rel   : num [1:6038] 11 15 4 5 16 15 16 12 11 11 ...
## $ trans_environ    : num [1:6038] 16 16 10 12 16 16 16 19 19 17 ...
## $ who_psy_total    : num [1:6038] 23 21 20 14 24 22 15 24 27 23 ...
## $ who_ph_total     : num [1:6038] 29 28 23 20 26 18 20 28 31 16 ...
## $ who_soc_rel_total : num [1:6038] 8 11 3 4 12 11 12 9 8 8 ...
## $ who_env_total    : num [1:6038] 31 32 19 23 31 32 31 37 38 33 ...
```

```
## $ qol_mean          : num [1:6038] 3.74 3.87 2.48 2.22 3.83 ...
## - attr(*, "spec")=
## .. cols(
## ..   record_id = col_double(),
## ..   redcap_event_name = col_character(),
## ..   redcap_event_number = col_double(),
## ..   who_1 = col_double(),
## ..   who_2 = col_double(),
## ..   who_3 = col_double(),
## ..   who_4 = col_double(),
## ..   who_5 = col_double(),
## ..   who_6 = col_double(),
## ..   who_7 = col_double(),
## ..   who_8 = col_double(),
## ..   who_9 = col_double(),
## ..   who_10 = col_double(),
## ..   who_11 = col_double(),
## ..   who_12 = col_double(),
## ..   who_13 = col_double(),
## ..   who_14 = col_double(),
## ..   who_15 = col_double(),
## ..   who_16 = col_double(),
## ..   who_17 = col_double(),
## ..   who_18 = col_double(),
## ..   who_19 = col_double(),
## ..   who_20 = col_double(),
## ..   who_21 = col_double(),
## ..   who_22 = col_double(),
## ..   who_23 = col_double(),
## ..   who_24 = col_double(),
## ..   who_25 = col_double(),
## ..   who_26 = col_double(),
## ..   who_qol_gh_total = col_double(),
## ..   trans_phys_hlth = col_double(),
## ..   trans_psych_health = col_double(),
## ..   trans_soc_rel = col_double(),
## ..   trans_environ = col_double(),
## ..   who_psy_total = col_double(),
## ..   who_ph_total = col_double(),
## ..   who_soc_rel_total = col_double(),
## ..   who_env_total = col_double(),
## ..   qol_mean = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_commitment)
```

```
## spc_tbl_ [6,038 x 9] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id          : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name   : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_
## $ redcap_event_number : num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ change_1           : num [1:6038] NA 2 NA 5 NA NA 5 6 6 NA ...
## $ change_2           : num [1:6038] NA 3 NA 5 NA NA 5 6 6 NA ...
## $ change_3           : num [1:6038] NA 3 NA 5 NA NA 5 6 6 NA ...
## $ change_4           : num [1:6038] NA 3 NA 5 NA NA 6 6 6 NA ...
```

```
## $ change_5 : num [1:6038] NA 5 NA 6 NA NA 6 6 6 NA ...
## $ commit_to_change.total: num [1:6038] 0 16 0 26 0 0 27 30 30 0 ...
## - attr(*, "spec")=
## .. cols(
## .. record_id = col_double(),
## .. redcap_event_name = col_character(),
## .. redcap_event_number = col_double(),
## .. change_1 = col_double(),
## .. change_2 = col_double(),
## .. change_3 = col_double(),
## .. change_4 = col_double(),
## .. change_5 = col_double(),
## .. commit_to_change.total = col_double()
## .. )
## - attr(*, "problems")=<externalptr>
```

```
str(raw_craving)
```

```
## spc_tbl_ [6,038 x 64] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseline_arm_1" ...
## $ redcap_event_number: num [1:6038] 0 0 0 0 0 0 0 1 2 0 ...
## $ dase1 : num [1:6038] 2 1 5 3 3 1 2 3 5 5 ...
## $ dase2 : num [1:6038] 2 1 5 5 3 4 1 2 4 5 ...
## $ dase3 : num [1:6038] 1 1 5 2 3 5 1 3 4 5 ...
## $ dase4 : num [1:6038] 2 1 5 5 4 5 3 5 5 5 ...
## $ dase5 : num [1:6038] 3 1 5 5 4 4 3 4 5 5 ...
## $ dase6 : num [1:6038] 2 1 5 2 3 4 3 4 5 5 ...
## $ dase7 : num [1:6038] 2 1 5 5 4 4 3 5 5 5 ...
## $ dase8 : num [1:6038] 2 1 5 5 2 5 4 5 5 5 ...
## $ dase9 : num [1:6038] 2 1 5 5 4 5 4 5 5 5 ...
## $ dase10 : num [1:6038] 2 1 5 5 3 5 3 5 5 5 ...
## $ dase11 : num [1:6038] 2 1 5 4 3 4 1 4 5 5 ...
## $ dase12 : num [1:6038] 2 1 5 4 3 4 4 5 5 5 ...
## $ dase13 : num [1:6038] 2 1 5 4 2 2 1 2 4 5 ...
## $ dase14 : num [1:6038] 2 1 5 5 3 3 3 4 5 5 ...
## $ dase15 : num [1:6038] 1 1 5 5 2 5 4 5 5 5 ...
## $ dase16 : num [1:6038] 2 1 5 2 3 2 3 4 5 5 ...
## $ dase17 : num [1:6038] 2 1 5 5 3 5 5 5 5 5 ...
## $ dase18 : num [1:6038] 2 1 3 4 3 3 4 4 5 5 ...
## $ dase19 : num [1:6038] 2 1 3 4 3 3 3 4 5 5 ...
## $ dase20 : num [1:6038] 2 1 5 NA 3 5 4 5 5 5 ...
## $ aase1 : num [1:6038] 4 5 5 5 5 NA NA NA NA 5 ...
## $ aase2 : num [1:6038] 4 5 5 5 5 NA NA NA NA 5 ...
## $ aase3 : num [1:6038] 4 5 5 3 4 NA NA NA NA 5 ...
## $ aase4 : num [1:6038] 2 5 5 NA 4 NA NA NA NA 2 ...
## $ aase5 : num [1:6038] 4 5 5 5 4 NA NA NA NA 4 ...
## $ aase6 : num [1:6038] 4 5 5 3 4 NA NA NA NA 3 ...
## $ aase7 : num [1:6038] 4 5 5 5 4 NA NA NA NA 2 ...
## $ aase8 : num [1:6038] 2 5 5 5 4 NA NA NA NA 2 ...
## $ aase9 : num [1:6038] 4 5 5 5 4 NA NA NA NA 5 ...
## $ aase10 : num [1:6038] 4 5 5 5 3 NA NA NA NA 3 ...
## $ aase11 : num [1:6038] 3 5 5 5 4 NA NA NA NA 3 ...
## $ aase12 : num [1:6038] 4 5 5 5 4 NA NA NA NA 5 ...
## $ aase13 : num [1:6038] 4 5 5 5 3 NA NA NA NA 5 ...
```



```

## $ aase14 : num [1:6038] 4 5 5 5 4 NA NA NA NA 5 ...
## $ aase15 : num [1:6038] 2 5 5 5 3 NA NA NA NA 1 ...
## $ aase16 : num [1:6038] 4 5 5 2 4 NA NA NA NA 3 ...
## $ aase17 : num [1:6038] 2 5 5 5 4 NA NA NA NA 3 ...
## $ aase18 : num [1:6038] 4 5 5 5 5 NA NA NA NA 4 ...
## $ aase19 : num [1:6038] 4 5 5 5 4 NA NA NA NA 3 ...
## $ aase20 : num [1:6038] 2 5 5 5 4 NA NA NA NA 4 ...
## $ pacs_1 : num [1:6038] 2 4 0 5 2 3 5 0 0 0 ...
## $ pacs_2 : num [1:6038] 3 3 0 6 1 3 5 0 0 0 ...
## $ pacs_3 : num [1:6038] 1 2 0 6 1 1 5 0 0 0 ...
## $ pacs_4 : num [1:6038] 3 4 0 6 1 3 5 0 0 4 ...
## $ pacs_5 : num [1:6038] 1 2 0 6 1 2 4 0 0 1 ...
## $ dase_neg_mean : num [1:6038] 1.8 1 4.6 3 3 3.4 2.8 3.8 4.8 5 ...
## $ aase_neg_mean : num [1:6038] 4 5 5 3.6 4.2 NA NA NA NA 4 ...
## $ dase_pos_mean : num [1:6038] 1.8 1 5 5 2.8 5 4 5 5 5 ...
## $ aase_pos_mean : num [1:6038] 2 5 5 5 3.8 NA NA NA NA 2.4 ...
## $ dase_phy_mean : num [1:6038] 2.2 1 5 4.6 3.2 3.8 2.6 3.6 4.6 5 ...
## $ aase_phy_mean : num [1:6038] 4 5 5 5 4 NA NA NA NA 4.8 ...
## $ dase_crv_mean : num [1:6038] 2 1 4.6 4.2 3.2 3.4 2.4 4.2 5 5 ...
## $ aase_crv_mean : num [1:6038] 3.8 5 5 5 4 NA NA NA NA 3.2 ...
## $ dase_tot_mean : num [1:6038] 1.95 1 4.8 4.16 3.05 ...
## $ aase_tot_mean : num [1:6038] 3.45 5 5 4.63 4 ...
## $ pacs_mean : num [1:6038] 2 3 0 5.8 1.2 2.4 4.8 0 0 1 ...
## $ daase_low_neg_mean : num [1:6038] 1.8 1 4.6 3 3 3.4 2.8 3.8 4.8 4 ...
## $ daase_low_pos_mean : num [1:6038] 1.8 1 5 5 2.8 5 4 5 5 2.4 ...
## $ daase_low_phy_mean : num [1:6038] 2.2 1 5 4.6 3.2 3.8 2.6 3.6 4.6 4.8 ...
## $ daase_low_crv_mean : num [1:6038] 2 1 4.6 4.2 3.2 3.4 2.4 4.2 5 3.2 ...
## $ daase_low_tot_mean : num [1:6038] 1.95 1 4.8 4.16 3.05 ...
## - attr(*, "spec")=
## .. cols(
## .. record_id = col_double(),
## .. redcap_event_name = col_character(),
## .. redcap_event_number = col_double(),
## .. dase1 = col_double(),
## .. dase2 = col_double(),
## .. dase3 = col_double(),
## .. dase4 = col_double(),
## .. dase5 = col_double(),
## .. dase6 = col_double(),
## .. dase7 = col_double(),
## .. dase8 = col_double(),
## .. dase9 = col_double(),
## .. dase10 = col_double(),
## .. dase11 = col_double(),
## .. dase12 = col_double(),
## .. dase13 = col_double(),
## .. dase14 = col_double(),
## .. dase15 = col_double(),
## .. dase16 = col_double(),
## .. dase17 = col_double(),
## .. dase18 = col_double(),
## .. dase19 = col_double(),
## .. dase20 = col_double(),
## .. aase1 = col_double(),

```

```

## .. aase2 = col_double(),
## .. aase3 = col_double(),
## .. aase4 = col_double(),
## .. aase5 = col_double(),
## .. aase6 = col_double(),
## .. aase7 = col_double(),
## .. aase8 = col_double(),
## .. aase9 = col_double(),
## .. aase10 = col_double(),
## .. aase11 = col_double(),
## .. aase12 = col_double(),
## .. aase13 = col_double(),
## .. aase14 = col_double(),
## .. aase15 = col_double(),
## .. aase16 = col_double(),
## .. aase17 = col_double(),
## .. aase18 = col_double(),
## .. aase19 = col_double(),
## .. aase20 = col_double(),
## .. pacs_1 = col_double(),
## .. pacs_2 = col_double(),
## .. pacs_3 = col_double(),
## .. pacs_4 = col_double(),
## .. pacs_5 = col_double(),
## .. dase_neg_mean = col_double(),
## .. aase_neg_mean = col_double(),
## .. dase_pos_mean = col_double(),
## .. aase_pos_mean = col_double(),
## .. dase_phy_mean = col_double(),
## .. aase_phy_mean = col_double(),
## .. dase_crv_mean = col_double(),
## .. aase_crv_mean = col_double(),
## .. dase_tot_mean = col_double(),
## .. aase_tot_mean = col_double(),
## .. pacs_mean = col_double(),
## .. daase_low_neg_mean = col_double(),
## .. daase_low_pos_mean = col_double(),
## .. daase_low_phy_mean = col_double(),
## .. daase_low_crv_mean = col_double(),
## .. daase_low_tot_mean = col_double()
## .. )
## - attr(*, "problems")=<externalptr>

str(raw_change_impression)

## spc_tbl_ [6,038 x 3] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ record_id : num [1:6038] 1 1 2 2 3 4 4 4 4 5 ...
## $ redcap_event_name : chr [1:6038] "phabaseline_arm_1" "readmission_1_base_arm_1" "phabaseli
## $ patient_impression_change: num [1:6038] NA NA NA NA NA NA NA 7 NA NA ...
## - attr(*, "spec")=
## .. cols(
## .. record_id = col_double(),
## .. redcap_event_name = col_character(),
## .. patient_impression_change = col_double()
## .. )

```

```

## - attr(*, "problems")=<externalptr>
str(raw_data_dictionary)

## spc_tbl_ [1,124 x 18] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
## $ Variable / Field Name      : chr [1:1124] "record_id" "assess_id_a1" "dem_location"
## $ Form Name                  : chr [1:1124] "assessmentdatabank_tracking" "assessment"
## $ Section Header              : chr [1:1124] NA NA NA NA ...
## $ Field Type                  : chr [1:1124] "text" "text" "radio" "dropdown" ...
## $ Field Label                 : chr [1:1124] "Record ID" "A1. Assessment ID# " "A2. C
## $ Choices, Calculations, OR Slider Labels : chr [1:1124] NA NA "0, Vista | 1, FRC" "1, Emily Bart
## $ Field Note                  : chr [1:1124] NA "YYYYY0000AA" NA NA ...
## $ Text Validation Type OR Show Slider Number: chr [1:1124] NA NA NA NA ...
## $ Text Validation Min         : logi [1:1124] NA NA NA NA NA NA ...
## $ Text Validation Max         : logi [1:1124] NA NA NA NA NA NA ...
## $ Identifier?                 : chr [1:1124] NA NA NA NA ...
## $ Branching Logic (Show field only if...) : chr [1:1124] NA NA NA NA ...
## $ Required Field?             : chr [1:1124] NA "y" "y" "y" ...
## $ Custom Alignment            : chr [1:1124] NA NA "RH" NA ...
## $ Question Number (surveys only) : chr [1:1124] NA NA NA NA ...
## $ Matrix Group Name           : chr [1:1124] NA NA NA NA ...
## $ Matrix Ranking?             : logi [1:1124] NA NA NA NA NA NA ...
## $ Field Annotation            : chr [1:1124] NA NA " @HIDDEN-SURVEY" " @HIDDEN-SURVEY
## - attr(*, "spec")=
## .. cols(
## .. `Variable / Field Name` = col_character(),
## .. `Form Name` = col_character(),
## .. `Section Header` = col_character(),
## .. `Field Type` = col_character(),
## .. `Field Label` = col_character(),
## .. `Choices, Calculations, OR Slider Labels` = col_character(),
## .. `Field Note` = col_character(),
## .. `Text Validation Type OR Show Slider Number` = col_character(),
## .. `Text Validation Min` = col_logical(),
## .. `Text Validation Max` = col_logical(),
## .. `Identifier?` = col_character(),
## .. `Branching Logic (Show field only if...)` = col_character(),
## .. `Required Field?` = col_character(),
## .. `Custom Alignment` = col_character(),
## .. `Question Number (surveys only)` = col_character(),
## .. `Matrix Group Name` = col_character(),
## .. `Matrix Ranking?` = col_logical(),
## .. `Field Annotation` = col_character()
## .. )
## - attr(*, "problems")=<externalptr>

```