CHRIS Study

Touchscreen – Pittsburgh Sleep Quality Index

Version 1.1

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1. Introduction

This module stores information related to the sleep quality of the participants, that was collected with the self-assessment questionnaire on a touchscreen.

Participants book a morning appointment at the CHRIS study center, ranging from 7.45 to 8.45 a.m. Each study participant is assigned a workflow at the reception. If there are ten study participants (maximum capacity), there are ten different workflows, marked with the letters from "A" to "K". The current workflow is as follows: A-B-C-D-E-F-G-H-I-K. All the workflows can be found in the documentation of CHRIS Baseline/General information/Administrative data, in the file named "Workflows at baseline assessment". The self-administered questionnaire is filled in always after the blood draw, for most before the interview (workflows B, C, E, F, H, I, L). For the remainder, the self-administered questionnaire is filled in just after the interview (workflows A, G) or after the interview and the ECG measurement (workflow D).

The Pittsburgh Sleep Quality Index (PSQI) was developed by Buysse and colleagues to assess in a reliable and standardized manner the sleep quality and has been in use since 1989. It consists of nineteen items that cover the domains of subjective sleep quality, sleep latency, sleep duration, sleep efficiency (fraction of hours slept over hours in bed), sleep disturbance, use of sleep medication, and daytime dysfunction.

The German version was already available and validated, whereas the Italian version was translated by IfB researchers.

In scoring the PSQI, each of the above-mentioned domains is assigned a score, ranging from zero (no difficulty) to three (severe difficulty). The component scores are summed to produce a total score (range 0 to 21). Higher scores indicate worse sleep quality.

The self-assessment questionnaires and the guide for PSQI evaluation are available at CHRIS Baseline/Self-Assessment/Touchscreen, CHRIS Baseline/Self-Assessment/Touchscreen/Pittsburgh Sleep Quality Index, and online (see References section), respectively.

2. History version changes

Version 1 of this module was in use between August 24th,2011 and November 2nd, 2012, whereas the second version has been in use since November 5th, 2012.

Version 1 to Version 2

Variables added: x0sq14

The cleaning process added the variables x0sq01a, x0sq03a, x0sq04a, x0sq31, x0sq32, x0sq33, x0sq34, x0sq35, x0sq36, x0sq37, x0sq38, and x0sq39.

3. Data cleaning

1. The main CHRIS dataset was loaded.

2. The variable x0sq14, available only since the second version, was assigned "Not in use" (-98) if the participant answered the first questionnaire version (x0sqver=1).
3. All the categorical variables that were useful to compute the PSQI score, x0sq02, x0sq05-x0sq19, had their missing observations set to "Unexpected missing" (-89).
4. The number of missing answers in the variables x0sq05-x0sq19 was computed and saved as psq_missing1. Additionally, the number of missing answers in the variables x0sq02 and x0sq05-x0sq19 was computed and saved as psq_missing2.
5. The questions addressed to the room mate or bed partner, x0sq20-x0sq23, had their missing observations set to:
    a) "Missing by design" (-99) if the participant declared not to have a bed partner or room mate (x0sq19= "No bed partner or room mate"),
    b) "Unexpected missing" (-89) otherwise.
6. The average sleep duration variable x0sq04 was copied, converted from HH:MM:SS format into float, and saved as x0sq04a. When missing, it was set to "Unexpected missing".
7. The usual bedtime in the past month, x0sq01, the usual time needed to fall asleep, x0sq02, and the usual waking up time, x0sq03, were copied and saved, respectively, as x0sq01a, x0sq02a, and x0sq03a. This were meant as the corrected versions of the reported times.
8. The corrected usual bedtime x0sq01a was set to missing if x0sq01a coincided with the waking up time x0sq03a and x0sq01a was between 01:00 and 12:00. The corrected waking up time x0sq03a was set to missing if x0sq01a coincided with the waking up time x0sq03a and x0sq01a was between 20:00 and 01:00.
9. The confusion between a.m. times and p.m. times was solved as follows:
    a) 12 hours were added to the usual bedtime (x0sq01a) if it was between 07:00 and 12:00, the waking up time x0sq03a was between 7:00 and 13:00 and the average sleep duration was between 3 to 12 hours, or if the corresponding Munich Chronotype Questionnaire (MCTQ) bedtime x0mc05a and the MCTQ preparing to fall asleep time x0mc06a were between 19:00 and 23:39,
    b) 12 hours were subtracted to the usual bedtime (x0sq01a) if it was between 12:00 and 13:00, the waking up time x0sq03a was between 03:00 and 11:00 and the average sleep duration was between 4 to 11 hours, or if the MCTQ bedtime x0mc05a and the MCTQ preparing to fall asleep time x0mc06a were between 19:00 and 23:39,
    c) 12 hours were also added to the usual bedtime (x0sq01a) if it was between 08:00 and 12:00, the waking up time x0sq03a was not between 13:00 and 18:00.
10. The difference in hours between the various time variables, divided into workday and free day, was computed to check for further errors. The MCTQ sleep onset on workdays was computed as the workday preparing to sleep time (x0mc06a) plus the number of minutes needed to fall asleep on workdays (x0mc07) converted in milliseconds, then transformed into HH:MM: SS.sss format, and saved as SOw. The MCTQ sleep duration on workdays was computed as the difference between the workday waking up time and the sleep onset on workdays, converted into hours, and saved as SDw. The MCTQ workdays getting up time was computed as the sum of the workdays waking up time (x0mc08a) and the time needed to get up on workdays (x0mc10) converted in milliseconds, then transformed into HH:MM:SS.sss, and saved as GUw. The MCTQ workdays total time in bed was computed as the difference between the workdays getting up time GUw and the workdays bedtime x0mc05a, transformed in hours, and saved as TBTw. The

same quantities were computed for free days and saved as SOf, SDf, GUf, TBTf. The total time in bed was computed for PSQI as the difference between x0sq03a and x0sq01a, and saved as tbt_psqi.

11. The usual bedtime x0sq01a was added 20 hours if one of the following cases applied:
    a) x0sq01a was between 02:00 and 02:59 and its MCTQ equivalent workdays and free days bedtime x0mc05a and x0mc11a were between 22:00 and 22:59, and the usual waking up time x0sq03a was between 01:00 and 08:00,
    b) x0sq01a was between 03:00 and 03:59 and its MCTQ equivalent workdays and free days bedtime x0mc05a and x0mc11a were between 23:00 and 23:59, and the usual waking up time x0sq03a was between 01:00 and 08:00,
    c) x0sq01a was between 02:00 and 02:59 and the MCTQ workdays and free days preparing to fall asleep time x0mc06a and x0mc12a were between 22:00 and 22:59, and the usual waking up time x0sq03a was between 01:00 and 08:00,
    d) x0sq01a was between 03:00 and 03:59 and the MCTQ workdays and free days preparing to fall asleep time x0mc06a and x0mc12a were between 23:00 and 23:59, and the usual waking up time x0sq03a was between 01:00 and 08:00.

12. Inconsistencies between bedtime, x0sq01a, time needed to fall asleep, x0sq02a, waking up time, x0sq03a, and average sleep duration, x0dq04a, were solved as follows:
    a) The usual bedtime x0sq01a was set to missing if x0sq01a was between 02:00 and 08:00 and the waking up time x0sq03a was between 02:00 and 08:00 and the PSQI total time in bed tbt_psqi was not between 3 and 11 hours,
    b) The usual bedtime x0sq01a was set to missing if x0sq01a was between 14:00 and 18:00 and the waking up time x0sq03a was between 04:00 and 13:00,
    c) The usual bedtime x0sq01a was set to missing if x0sq01a was between 01:00 and 18:00 and the waking up time x0sq03a was between 03:00 and 12:00, the absolute value of the difference between x0mc05a and x0sq01a was more than 2 hours, the absolute value of the difference between x0mc11a and x0sq01a was more than 2 hours,
    d) The usual bedtime x0sq01a was assigned the value of x0mc05a if x0sq01a was missing, x0mc05a coincided with x0mc11a, the difference between x0mc05a and x0m08a was in the range of 3 to 12 hours, the difference between x0mc11a and x0m14a was in the range of 3 to 12 hours,
    e) The usual waking up time x0sq03a was set to missing if x0sq01a was between 19:00 and 02:00, the waking up time was between 14:00 and 02:00, the PSQI total time in bed tbt_psqi was not between 3 and 12 hours,
    f) The usual waking up time x0sq03a was set to missing if x0sq03a was not between 03:00 and 13:00, the average sleep duration x0sq04a was between 4 and 11 hours, tbt_psqi was not between 3 and 12 hours,
    g) The usual waking up time x0sq03a was set to missing if x0sq03a was not between 04:00 and 11:00, the absolute value of the difference between MCTQ waking up time x0mc08a and PSQI waking up time x0sq03a was above 3 hours, the absolute value of the difference between MCTQ waking up time x0mc14a and PSQI waking up time x0sq03a was above 3 hours, the absolute value of the difference between x0sq04a and tbt_psqi was above 3 hours,

h) The usual waking up time x0sq03a was assigned the value of x0mc08a plus the time needed to get up x0mc10 if x0sq03a was missing, x0mc08a coincided with x0mc14a, the difference between x0mc05a and x0m08a was in the range of 3 to 12 hours, the difference between x0mc11a and x0m14a was in the range of 3 to 12 hours, the workdays time needed to get up x0mc10 was not missing, and x0mc10 coincided with x0mc16,

i) The usual waking up time x0sq03a was assigned the value of x0mc08a if x0sq03a was missing, x0mc08a coincided with x0mc14a, the difference between x0mc05a and x0m08a was in the range of 3 to 12 hours, the difference between x0mc11a and x0m14a was in the range of 3 to 12 hours, the workdays time needed to get up x0mc10 was between 0 and 15 minutes, and the free days time needed to get up x0mc16 was between 0 and 15 minutes

j) The time needed to fall asleep x0sq02 was assigned the value of x0mc07 if x0sq02 was above 90 and containing some duplicated digits (e.g., 99, 100 and 101, 115 and 151 were turned into 9, 10, and 15, respectively),

k) The time needed to fall asleep was set to "Out of range" (-86) if x0sq02 was above 90 minutes, tbt_psqi was between 3 and 12 hours, the difference between tbt_psqi and x0sq02 was less than 3 hours.

l) The time needed to fall asleep was set to "Out of range" (-86) if x0sq02 was above 100 minutes, its MCTQ equivalent for workdays x0mc07 was between 0 and 90 minutes, its MCTQ equivalent for free days x0mc13 was between 0 and 90 minutes, the sum of x0sq02 and x0sq04a in hours were longer than tbt_psqi,

m) The time needed to fall asleep was set to "Out of range" (-86) if x0sq02 was above 90 minutes, x0sq04a was between 4 and 11 hours, tbt_psqi was between 4 and 11 hours, the sum of x0sq02 and x0sq04a in hours were longer than tbt_psqi of more than 1 hour,

n) The average sleep duration x0sq04a was set to "Out of range" if x0sq04a was between 0 and 2 hours, or between 20 and 24 hours,

o) The average sleep duration x0sq04a was set to "Out of range" if x0sq04a was not between 3 and 16 hours, tbt_psqi was between 4 and 11 hours, the difference between x0mc05a and x0mc08a was between 4 and 11 hours, the self-evaluated sleep quality x0sq15 was not "Very bad".

13. 12 hours were added to x0sq01a if its MCTQ equivalent x0mc05a was 12 hours later.

14. Furthermore, outliers were resolved as follows:

a) The usual bedtime x0sq01a was set to missing if x0sq01a was shorter than x0mc05a minus 2 hours, x0sq01a was shorter than x0mc11a minus 2 hours, the workdays MCTQ sleep duration SDw was longer or equal to x0sq04a, the free days MCTQ sleep duration SDf was longer or equal to x0sq04a,

b) The usual bedtime x0sq01a was set to missing if x0sq01a was shorter than x0mc05a minus 1 hour, x0sq01a was shorter than x0mc11a minus 1 hour, SDw was longer or equal to x0sq04a, SDf was longer or equal to x0sq04a, x0mc06a was at least at the same time or later than x0mc05a.

c) The usual bedtime x0sq01a was set to missing if x0sq01a was longer than x0mc05a of at least 2 hours, x0sq01a was longer than x0mc11a of at least 2 hours, x0sq01a coincided

neither with x0mc05a nor with x0mc06a, x0mc06a was shorter than x0mc05a plus 2 hours,

d) The waking up time x0sq03a was set to missing if x0sq03a was shorter than x0mc08a minus 2 hours, x0sq03a was shorter than x0mc14 minus 2 hours, SDw was longer or equal to x0sq04a, SDf was longer or equal to x0sq04a, x0mc08 and x0mc14 differed of at most 1 hour,

e) The waking up time x0sq03a was set to missing if x0sq03a was shorter than x0mc08a minus 1 hour, x0sq03a was shorter than x0mc14 minus 1 hour, SDw was longer or equal to x0sq04a, SDf was longer or equal to x0sq04a, x0mc08 and x0mc14 differed of at most 1 hour, x0sq04a was longer than tbt_psqi,

f) The waking up time x0sq03a was set to missing if x0sq03a was longer than x0mc08a plus 1 hour, x0sq03a was longer than x0mc14 plus 1 hour, SDw was longer or equal to x0sq04a, x0mc10 and x0mc16 were less than 60 minutes,

g) The time needed to fall asleep x0sq02 was set to "Out of range" if x0sq02 was above 120 minutes, and either x0sq01a or x0sq03a were missing,

h) The average sleep duration x0sq04a was set to "Out of range" if x0sq04a was longer than 12 hours, and either x0sq01a or x0sq03a were missing,

i) The usual bedtime x0sq01a was set to missing if tbt_psqi was longer than 14 hours and x0sq03a was not missing,

j) The usual waking up time was set to missing if tbt_psqi was longer than 14 hours, the getting up time on workdays GUw differed from x0sq03a of not more than 1 hour.

15. The inefficient sleepers were detected and corrected as follows:

a) The usual bedtime x0sq01a was set to missing if average sleep duration x0sq04a was between 4 and 11 hours, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1, x0sq01a differed from x0mc05a of at least 1 hour, x0sq03a and GUw differed of less than 1 hour, x0sq04a was shorter than total time in bed on workdays TBTw,

b) The usual waking up time x0sq03a was set to missing if x0sq04a was between 4 and 11 hours, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1, x0sq01a differed from x0mc05a of less than 1 hour, x0sq03a and GUw differed of at least 1 hour, x0sq04a was shorter than total time in bed on workdays TBTw,

c) The average sleep duration was set to "Out of range" if x0sq04a was at least 10 hours, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1, x0sq01a differed from x0mc05a of at most 1 hour, x0sq01a differed from x0mc11a of at most 1 hour, GUw and x0sq03a differed of at most 1 hour, GUf and x0sq03a differed of at most 2 hours,

d) The average sleep duration was set to "Out of range" if x0sq04a was not missing, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1, x0sq01a differed from x0mc05a of at most 1 hour, x0mc05a differed from x0mc11a of at most 1 hour, x0mc06a differed from x0mc12a of at most 1 hour, x0mc08a differed from x0mc14a of at most 1 hour, GUw and x0sq03a differed of at most 1 hour,

e) The average sleep duration was set to "Out of range" if x0sq04a was not missing, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1, x0sq01a

differed from x0mc05a of less than 1 hour, GUw and x0sq03a differed of less than 1 hour,

    f) The average sleep duration was set to "Out of range" if x0sq04a was at least 12 hours, tbt_psqi was not missing, the ratio of x0sq04a over tbt_psqi was above 1.1.

16. Cases with long total time in bed, long sleep duration or inconsistent ratio of sleep duration over total time in bed were corrected as follows:

    a) x0sq04a was set to "Out of range" if x0sq04a was longer than tbt_psqi plus 1 hour, neither x0sq01a nor x0sq03a were missing,

    b) x0sq04a was set to "Out of range" if the ratio of x0sq04a over tbt_psqi was above 1.2 or below 1.5, neither x0sq01a nor x0sq03a were missing, the MCTQ workdays time needed to fall asleep x0mc07 was less than 1 hour, the MCTQ free days time needed to fall asleep x0mc13 was less than 1 hour, the MCTQ workdays time needed to get up x0mc10 was less than 1 hour, the MCTQ free days time needed to get up x0mc16 was less than 1 hour, x0sq04a plus 2 hours was less than workdays sleep duration SDw and less than free days sleep duration SDf.

17. The usual bedtime x0sq01a was set to missing if x0sq02 was less than the time between bedtime and falling asleep (x0mc06a-x0mc05a+x0mc07) minus 90 minutes, x0sq02 was not missing, x0mc07 was not missing, x0mc05a was not missing, x0mc06a was not missing, x0sq04a was longer than SDw plus 1 hour, x0sq04a was longer than tbt_psqi.

18. Inconsistencies between total time in bed for PSQI and MCTQ both for workdays (TBTw) and free days (TBTf), with an allowed margin of 2 hours were corrected as follows:

    a) x0sq01a was set to missing if x0sq01 was larger than x0mc05a plus 1 hour, x0sq01 was larger than x0mc11a plus 1 hour, tbt_psqi plus 1 hour was shorter than TBTw and TBTf, x0sq04a was longer than tbt_psqi minus x0sq02 in hours,

    b) x0sq03a was set to missing if x0sq03 plus 1 hour was shorter than x0mc08a, x0sq03 plus 1 hour was shorter than x0mc14a, tbt_psqi plus 1 hour was shorter than TBTw and TBTf, x0sq04a was longer than the difference between tbt_psqi and x0sq02 in hours,

    c) x0sq03a was set to missing if tbt_psqi plus 1 hour was shorter than TBTw and TBTf, x0sq03a coincided with x0mc08a and with x0mc14a, x0mc10 and x0mc16 were longer than 60 minutes,

    d) x0sq03a was set to missing if x0sq03a and x0mc08a differed of more than 2 hours, x0mc08a coincided with x0mc14a, x0mc10 and x0mc16 were less than 60 minutes, the difference between tbt_psqi and x0sq04a was less than -1 hour or more than 2 hours.

    e) The time needed to fall asleep x0sq02 was assigned its MCTQ equivalent x0mc07 if x0sq02 was "Out of range", x0mc07 coincided with x0mc13, and x0mc07 was less than 100 minutes

19. The variables storing the total time in bed for PSQI and MCTQ and the time differences between variables were computed again and saved again with the same variable names.

20. Checking outliers, x0sq02 was set to "Out of range" if x0sq02 was longer than 90 minutes, the difference between x0mc06a and x0mc05a was less than 30 minutes, , the difference between x0mc12a and x0mc11a was less than 30 minutes, x0mc07 and x0mc13 were both less than 30 minutes.

21. The first component of PSQI on subjective sleep quality was assigned the values:

    a) "Unexpected missing" if x0sq15 was "Unexpected missing",

b) x0sq15-1 otherwise.

The variable was saved as x0sq31.

22. The question x0sq02 was divided into the categories 0-15 minutes, 16-30 minutes, 31-60 minutes, 61+ minutes, and each category corresponded, in increasing order, to a subscore from 0 to 3. The question x0sq05 had its answer items also corresponding to a subscore from 0 to 3. The second component of PSQI on sleep latency was assigned the values:
   a) "Unexpected missing" if x0sq05 was "Unexpected missing" or x0sq02 was "Out of range" or "Unexpected missing",
   b) 0 if the sum of the subscores derived from x0sq02 and x0sq05 was 0,
   c) 1 if the sum of the subscores derived from x0sq02 and x0sq05 was 1 or 2,
   d) 2 if the sum of the subscores derived from x0sq02 and x0sq05 was 3 or 4,
   e) 3 if the sum of the subscores derived from x0sq02 and x0sq05 was 5 or 6,

The variable was saved as x0sq32.

23. The third component of PSQI on sleep duration was assigned the values:
   a) "Unexpected missing" if x0sq04 was "Out of range",
   b) 0 if the average sleep duration x0sq04 was longer than 7 hours,
   c) 1 if x0sq04 was between 6 and 6.99 hours,
   d) 2 if x0sq04 was between 5 and 5.99 hours,
   e) 3 if x0sq04 was below 5 hours.

The variable was saved as x0sq33.

24. Sleep efficiency was computed as the ratio of the sleep duration x0sq04a over the time spent in bed tbt_psqi in percentage and saved as se_perc. The fourth component of PSQI on sleep efficiency was assigned the values:
   a) "Unexpected missing" if se_perc was "Unexpected missing" (i.e. when either x0sq04a or tbt_psqi were "Out of range" or "Unexpected missing"),
   b) 0 if the sleep efficiency percentage se_perc was at least 85%,
   c) 1 if se_perc was at least 75% and less than 85%,
   d) 2 if se_perc was at least 65% and less than 75%,
   e) 3 if se_perc was below 65%.

The variable was saved as x0sq34.

25. Each question on sleep disturbances, x0sq05-x0sq14, was assigned a subscore from 0 to 3, according to the answer order "Not during the past month", "Less than once a week", "Once or twice a week", "Three or more times a week". The fifth component of PSQI on sleep disturbances was assigned the values:
   a) "Unexpected missing" if any subscore derived from x0sq05-x0sq14 was "Unexpected missing",
   b) 0 if the sum of the subscores derived from x0sq05-x0sq14 was 0,
   c) 1 if the sum of the subscores derived from x0sq05-x0sq14 was between 1 and 9 and x0sqver was the second,

d) 2 if the sum of the subscores derived from x0sq05-x0sq14 was between 10 and 18 and x0sqver was the second,

e) 3 if the sum of the subscores derived from x0sq05-x0sq14 was between 19 and 30 and x0sqver was the second,

f) 1 if the sum of the subscores derived from x0sq05-x0sq13 was between 1 and 8 and x0sqver was the first,

g) 2 if the sum of the subscores derived from x0sq05-x0sq13 was between 9 and 16 and x0sqver was the first,

h) 3 if the sum of the subscores derived from x0sq05-x0sq13 was between 17 and 27 and x0sqver was the first.

The variable was saved as x0sq35.

26. The sixth component of PSQI on use of sleep medication was assigned the values:
    a) "Unexpected missing" if x0sq16 was "Unexpected missing",
    b) x0sq16-1 otherwise.

The variable was saved as x0sq36.

27. Both variables x0sq17 and x0sq18 were assigned a subscore from 0 to 3, according to the answer order. The seventh component of PSQI on daytime dysfunction was assigned the values:
    a) "Unexpected missing" if either x0sq17 or x0sq18 was "Unexpected missing",
    b) 0 if the sum of the subscores derived from x0sq17 and x0sq18 was 0,
    c) 1 if the sum of the subscores derived from x0sq17 and x0sq18 was 1 or 2,
    d) 2 if the sum of the subscores derived from x0sq17 and x0sq18 was 3 or 4,
    e) 3 if the sum of the subscores derived from x0sq17 and x0sq18 was 5 or 6.

The variable was saved as x0sq37.

28. The PSQI global score was computed as the sum of the seven PSQI components, x0sq31-x0sq37, and it was assigned "Unexpected missing" if any of those components was "Unexpected missing". It was saved as x0sq38.

29. A sleep quality variable was created and assigned the values:
    a) "Unexpected missing" if x0sq38 was "Unexpected missing",
    b) "Good sleep quality" if x0sq38 was between 0 and 5,
    c) "Poor sleep quality" if x0sq38 was between 6 and 21.

It was saved as x0sq39.

30. The minimum PSQI global score was estimated computing the sum of those seven PSQI components, x0sq31-x0sq37, that were not missing. It was saved as x0sq38a.

31. A second sleep quality variable was created based on the minimum PSQI global score and assigned the values:
    a) "Unexpected missing" if x0sq38 was "Unexpected missing",
    b) "Good sleep quality" if x0sq38 was between 0 and 5,
    c) "Poor sleep quality" if x0sq38 was between 6 and 21.

It was saved as x0sq39a.

32. The baseline dataset was saved.

4. Advices for the analysis

The cleaning process tried to solve most of the inconsistencies among the different times that were filled in (e.g. bedtime occurring before waking up), as well as typos and a.m. times inserted instead of p.m. times. However, 1 hour margin of inconsistency was tolerated.

There are several scores calculated with the PSQI instrument: the global score PSQI and its seven components. In the literature, a global PSQI score above 5 has been found to be suggestive of sleep problems of the respondent.

The analyst is advised to use x0sq38 to detect the participants with a good sleep quality, whereas it would be better to use the variable x0sq38a, should the analyst want to detect participants with a bad sleep quality.

Additional information related to sleep quality was measured with the Munich Chronotype Questionnaire and the REM Sleep Behavior Disorder instruments in the self-administered questionnaire and it can be found in the modules x0mc and x0rb, respectively.

Furthermore, sleep disorders were reported in the neurology module of the interview, and they can be found in the variables x0ne11, x0ne11b, x0ne11c, and x0ne11d.

5. References

Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res*. 1989 May;28(2):193-213. DOI: 10.1016/0165-1781(89)90047-4

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