CHRIS Study

Touchscreen – REM Sleep Behavior Disorder

Version 1.1

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1. Introduction

This module stores information related to the behavior during sleep of the participants, that was mainly 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 REM Sleep Behavior Disorder (RBDQ) was developed by Stiasny-Kolster and colleagues to assess in a reliable and standardized manner REM sleep behavior disorder (RBD) and has been in use since 2007. It consists of ten items that cover the most prominent clinical features of RBD, according to the International Classification on Sleep Disorders. The questionnaire was originally developed and validated in German, whereas the Italian version was translated by IfB researchers.

Using a cut-off value of five points on the RBDQ, the validation study found a sensitivity of 96% and a specificity of 56%, with 66% of subjects with sleep disorders correctly diagnosed. However, for a definite diagnostic decision, a polysomnography is required predominantly to definitely rule out differential diagnoses such as sleep-related epileptic seizures, non-REM parasomnias (e.g., sleepwalking), obstructive sleep apnea or nocturnal periodic leg movements. In addition, it is impossible to detect patients with subclinical RBD. Furthermore, subsequent studies have found higher cut-offs to have better diagnostic value in the general population.

The RBDQ text in German and English is available online (see References section).

2. History version changes

Version 1 of this module was in use between August 24th,2011 and November 2nd, 2012, it was part of the interview, and restricted to participants positive to Parkinson (x0pk10=1 or x0pk11=1 or x0pk12≥3). Instead, the second version has been included in the self-administered questionnaire and it has been in use since November 27th, 2012. The questionnaire was not asked between November 5th, 2012 and November 26th, 2012.

Version 1 to Version 2

Question filtering criteria changed: x0rb05 (before if x0rb04=1 → no restriction)

The cleaning process added the variables x0rb14 and x0rb15.

3. Data cleaning

1. The main CHRIS dataset was loaded.

2. The variable x0rb05 was assigned “Missing by design” (-99) if the participant was not aware of moving their legs and arms when sleeping and the questionnaire version was the first (x0rbver=1 and x0rb04=”No”).
3. All the instrument items, x0rb01-x0rb13, had their missing observations set to:
    a) “Missing by design” (-99) if the questionnaire version was the first (x0rbver==1),
    b) “Not in use” (-98) if the questionnaire version was missing, i.e. for the 3 weeks the questionnaire was not part of neither the interview nor the self-administered questionnaire,
    c) “Unexpected missing” (-89) otherwise.
4. The total RBDQ score, named x0rb14, was assigned the values:
    a) The sum of positive answers among the variables x0rb01-x0rb13,
    b) “Missing by design” (-99) if the questionnaire version was the first and x0rb14 was still missing (x0rbver=1 and x0rb14=.), since it was asked only to participants positive to Parkinson screening in x0pk10-x0pk12,
    c) “Not in use” (-98) if the questionnaire version was missing and x0rb14 was still missing (x0rbver=. and x0rb14=.),
    d) “Unexpected missing” (-89) if any of the item variables x0rb01-x0rb13 was missing or if x0rb14 was still missing.
5. A variable classifying the RBDQ screening was created with values:
    a) “Missing by design” if x0rb14 was “Missing by design”,
    b) “Not in use” if x0rb14 was “Not in use”,
    c) “Unexpected missing” if x0rb14 was “Unexpected missing”,
    d) “No” if x0rb14 was below 5,
    e) “Yes” if x0rb14 was at least 5.

    It was saved as x0rb15.

6. Another total RBDQ score was computed on all participants with at least one answer available among x0rb01-x0rb13, and it was assigned the values:
    a) The sum of positive answers among the variables x0rb01-x0rb13,
    b) “Missing by design” if x0rb14 was “Missing by design”,
    c) “Not in use” if x0rb14 was “Not in use”.

    It was saved as x0rb14a.

7. A new variable classifying the RBDQ screening for all participants with at least one answer available was created with values:
    a) “Missing by design” if x0rb15 was “Missing by design”,
    b) “Not in use” if x0rb15 was “Not in use”,
    c) “No” if x0rb14a was below 5,
    d) “Yes” if x0rb14a was at least 5.

    It was saved as x0rb15a.

8. The variable on the questionnaire version x0rbver was set to “Not in use” if it was missing.
9. The baseline dataset was saved.

4. Advices for the analysis

The RBDQ score has been computed for the participants with all answers available in x0rb01-x0rb13 (x0rb14), and also for the participants with at least one answer available (x0rb14a). Furthermore, an RBDQ score has been provided with the exclusion of the last question (x0rb13) on diagnosed neurological conditions (x0rb16).

The suggested cutoff of 5 to detect RBD in the original validation study has been found too low for population studies. Instead, higher cutoff values, such as 8, have proposed by later studies on a more general population.

Additional information related to sleep quality was measured with the Munich Chronotype Questionnaire and the Pittsburgh Sleep Quality Index instruments in the self-administered questionnaire and it can be found in the variables x0mc* and x0sq*, 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. For what concerns the diseases of the nervous system assessed in question x0rb13, the various conditions can be found, respectively: restless legs syndrome in x0ne21 and x0ne22 and x0rd, depression in x0ot and x0ds, epilepsy in x0ne09 and x0ne09b, stroke in x0st module, Parkinson in x0pk10 and x0pk11, meningitis in x0ot*, head trauma in x0ol24 and x0ol24a.

5. References

Stiasny-Kolster K, Mayer G, Schäfer S, Möller JC, Heinzel-Gutenbrunner M, Oertel WH. The REM sleep behavior disorder screening questionnaire--a new diagnostic instrument. 2007, Mov Disord. Dec;22(16):2386-93. DOI: 10.1002/mds.21740

RBDQ English and German text: Stiasny-Kolster et al. 2007, Table 1.

Marelli S, Rancoita PM, Giarrusso F, Galbiati A, Zucconi M, Oldani A, et al. National validation and proposed revision of REM sleep behavior disorder screening questionnaire (RBDSQ). J Neurol. 2016 Dec;263(12):2470-2475. DOI: 10.1007/s00415-016-8285-y.