CHRIS Study

Touchscreen – Physical activity

Version 1.1

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1. Introduction

This module stores information related to the physical activity of the participants, that was collected mainly 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 interview occurs always after the spiralography and the blood drawing, for most as the last session, after the ECG assessment and the self-administered questionnaire (workflows B, C, E, F, H, I, L). For the remainder, the interview occurs after breakfast and just before the self-administered questionnaire (workflows A and G) or in between the blood drawing and the anthropometry (workflow D).

The International Physical Activity Questionnaire (IPAQ) comprises a set of four questionnaires. Long (five activity domains asked independently) and short (four generic items) versions for use by either telephone or self-administered methods are available. The purpose of the questionnaires is to measure health–related physical activity in a comparable manner across Countries. Its development commenced in Geneva in 1998 and was followed by extensive reliability and validity testing undertaken across twelve countries in 2000. The IPAQ measures have acceptable measurement properties for use in many settings and in different languages and are suitable for national population-based prevalence studies of participation in physical activity. It is recommended that no changes be made to the order or wording of the questions as this will affect the psychometric properties of the instruments.

Translation from English is supported to facilitate worldwide use of IPAQ. Information on the availability of IPAQ in different languages can be obtained at www.ipaq.ki.se. German and Italian translations were already available and validated.

The self-assessment questionnaires and its scoring guidelines are 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; Version 2 was then in use since November 5th, 2012.

Version 1 to Version 2

Until November 2nd, 2012, the module was interview-based; since November 5th, 2012, the module was self-administered with the touchscreen.

The cleaning process added the variables x0ip01d, x0ip02d, x0ip03d, x0ip05, x0ip06, x0ip07, x0ip08, and x0ip09.

3. Data cleaning

1. The main CHRIS dataset was loaded.
2. The variables on the occurrence of vigorous physical activity, moderate physical activity, and walking, x0ip01, x0ip02, and x0ip03, had their values higher than seven transformed as follows:
   a) Any duplicate number such as 11 or 22 was divided by 11, assuming the participant double clicked on the same key,
   b) Similarly, the value 6666 was substituted with 6, and the value 4.4 10^{13} was substituted with 4,
   c) other values not between 0 and 7 were set to "Out of range" (-86),
   d) the observations that were still missing were set to "Unexpected missing" (-89).
3. For each activity level, the missing observations of the variable in hours/day were set to zero if the corresponding observation of the variable in minutes/day was not empty, and viceversa. For instance, if the hours per day of vigorous activity x0ip01b were missing and the minutes per day of vigorous activity in x0ip01a were positive, then x0ip01b was set to zero. The same procedure was performed on x0ip02a-x0ip02b, and on x0ip03a-x0ip03b.
4. The amounts of time spent per week for vigorous activity, moderate activity, and walking, were created summing the hours (multiplied by 60) and minutes for each activity type, and saved, respectively, as x0ip01d, x0ip02d, and x0ip03d.
5. For each activity type, if the total time was the double of the time reported in minutes, this meant that the participant reported twice the same time in both the units of measure, and therefore the total amount was divided by two. For instance, if x0ip01d= 2 * x0ip01b and x0ip01d>0, then x0ip01d was replaced by its half.
6. For each activity type, unlikely observations were corrected as follows:
   a) if the time reported only in hours and was at least 15 and a multiple of 5 (e.g., 15,20, 30, 45, 60, 90), then the value was shifted to the correspondent variable in minutes, and the total amount computed again. For instance, if x0ip01a= 15 and x0ip01b=0, then x0ip01b was set to 15 and x0ip01a to 0, and x0ip01d recomputed.
   b) If instead the time was reported both in hours and in minutes and had values in the list 15, 20, 30, 45, 60, then the variable in hours was set to zero and the total amount computed again. For instance, if x0ip02a=20 and x0ip02b=20, then x0ip02a was set to 0, and x0ip02d recomputed.
   c) If instead the variable in minutes had values of 1 or 2 and the corresponding variable in hours had values in the list 15, 20, 30, 45, 60, then the values were replaced and the total amount computed again. For instance, if x0ip03a=20 and x0ip03b=1, then x0ip03a was set to 1, x0ip03b to 20, and x0ip02d recomputed.
7. For each activity type, if the participant answered "I do not know", then all the missing observations of the variables on time spent were set to "Don't know" (-88).
8. Outliers in the total amounts of time spent per activity type (x0ip01d, x0ip02d, x0ip03d) were further assessed as follows:
   a) If the total amount of time spent for all the enquired activity types was above 16 hours, then for each activity type the total time variable was set to "Out of range" (-86),

b) If the total amount of time spent for one activity type was below 10 minutes, despite the request to consider only activities for at least 10 continuous minutes, then it was set to zero,

c) If the total amount of time spent for one activity type was above 180 minutes, then it was truncated to 180, as recommended in the IPAQ scoring protocol.

9. For each activity type, if the number of days per week doing this activity type were 0, then all the corresponding following variables if missing were set to "Missing by design" (-99). For instance, if the participant reported no days performing vigorous activity (x0ip01=0), then the missing observations of x0ip01a, x0ip01b, and x0ip01d were set to -99.

10. For each activity type, if the number of days per week doing this activity type were positive, then all the corresponding following variables if missing were set to "Unexpected missing" (-89). For instance, if the participant reported some days performing vigorous activity (x0ip01>0), then the missing observations of x0ip01a, x0ip01b, and x0ip01d were set to -89.

11. The Vigorous (Metabolic Equivalent Task) MET-minutes/week was computed as 8 * N days of vigorous activity * min/day (8 * x0ip01 * x0ip01d) and saved as x0ip05. The moderate MET-minutes/week was computed as 4 * N days of moderate activity * min/day (4 * x0ip02 * x0ip02d) and saved as x0ip06. The walking MET-minutes/week was computed as 3.3 * N days of walking * min/day (3.3 * x0ip03 * x0ip03d) and saved as x0ip07. Each of those were set to zero if the reported days of that activity type were zero, and to "Unexpected missing" if either the reported days or the total amount of time spent for that activity type were missing.

12. The total physical activity MET-minutes/week was computed as the sum of vigorous, moderate, and walking MET-minutes/week (i.e., x0ip05+x0ip06+x0ip07) and saved as x0ip08. It was set to "Unexpected missing" if either of the three variables was missing.

13. The categorical IPAQ score was assigned the value "High" if at one of the following conditions held:

   a) Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week

   b) 7 or more days of any combination of walking, moderate- or vigorous-intensity activities accumulating at least 3000 MET-minutes/week

The categorical IPAQ score was assigned the value "Moderate" if at one of the following conditions held:

   a) 3 or more days of vigorous activity of at least 20 minutes per day

   b) 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day

   c) 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week

The categorical IPAQ score was assigned the value "Low" if no activity was reported OR some activity was reported but not enough to meet the previous categories.

14. The variable storing the nurses' notes on the IPAQ score, x0ipnote, was translated and categorized when possible.

15. The baseline dataset was saved.

4. Advices for the analysis

The content of the nurse's notes includes information on sickness in the previous week, on vacation in the previous week, and on fractures that preclude movement.

The participants that reported in the interview to currently work, also reported on the type of physical activity they perform on their workplace, in the variable x0oc08.

Furthermore, when measuring their anthropometry parameters, participants reported on their implants (x0an08) and their amputations (x0an09).

Finally, the analyst should always take into account that the operator in charge of carrying out the interview, until November 2nd, 2012, might have influenced how the participant reported their answers, at least in the first version of the module. The analyst should therefore adjust for the operator variable, x0_opint, and the module version x0ipver, when possible.

5. References

Booth, M.L., Assessment of Physical Activity: An International Perspective. Research Quarterly for Exercise and Sport, 2000, 71(2): s114-20. DOI: 10.1080/02701367.2000.11082794

Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE, et al. International physical activity questionnaire: 12-country reliability and validity. Med Sci Sports Exerc. 2003 Aug;35(8):1381-95. DOI: 10.1249/01.MSS.0000078924.61453.FB

Murgia F, Melotti R, Foco L, Gögele M, Meraviglia V, Motta B, et al. Effects of smoking status, history and intensity on heart rate variability in the general population: The CHRIS study. PLoS One. 2019 Apr 9;14(4):e0215053. DOI: 10.1371/journal.pone.0215053

IPAQ development: https://sites.google.com/view/ipaq/home

IPAQ scoring guidelines: https://sites.google.com/view/ipaq/score

IPAQ various translations: https://sites.google.com/view/ipaq/download