

A user's guide to NOOS

The NOOS is a patient-reported outcome measure employing a five-item Likert scale. It covers five constructs (subscales): Mobility, Symptoms, Sleep disturbance, Everyday activity and pain, and Participation in every day life.

Missing data

The questionnaire was developed in an electronic version. When setting up the questionnaire, it should therefore be made mandatory to pick an item, before moving on to the next line of items, which most software programs can easily handle. However, if for some reason this is not the case the following procedures should be pursued. If two boxes are marked, the one indicating the most severe problems is chosen. Missing data are treated as such; one or two missing values are substituted with the average value for the subscale. If more than two items are omitted for the subscales: Mobility, Symptoms, Everyday activity and pain, and Participation in every day life, the response is considered invalid. If more than one item is omitted for the Sleep disturbance subscale, the response is considered invalid.

Score calculation

The five NOOS subscales are scored separately: Mobility (7 items); Symptoms (5 items); Sleep disturbance (4 items); Everyday activity and pain (8 items) and; Participation in every day life (10 items). The past week is taken into consideration when answering the questions. Standardised answer options are given (5 Likert boxes) and each question gets a score from 0 to 4, where 0 indicates no problem.

Assign the following scores to the boxes:

Not at all	Mild	Moderate	Considerable	Very considerable
0	1	2	3	4

The five scores are calculated as the sum of the items included. Raw scores are then transformed to a 0-100 scale, with zero representing extreme neck problems and 100 representing no neck problems. Scores between 0 and 100 represent the percentage of total possible score achieved. An aggregate score is not calculated, since it is regarded desirable to analyse and interpret the different dimensions separately. Subscale scores are independent and can be reported for any number of the individual subscales, i.e. if a particular subscale is considered invalid, the results from the remaining subscale can be reported.

Score calculation: The mean of the observed items within the subscale (e.g. mobility) is subtracted from 100, multiply with 100 and divide with 4; and you then have the Mobility subscale estimate for that particular cross-sectional assessment of the individual patient. Manual scoring formulas as well as excel formulas are provided below. Excel spreadsheets are available at koos.nu

For manual calculations, please use the formulas provided below for each subscale

1. Mobility $100 - \text{Mean score (M1-M7)} * 100 / 4 = \text{NOOS Mobility}$
2. Symptoms $100 - \text{Mean score (SY1-SY5)} * 100 / 4 = \text{NOOS Symptoms}$
3. Sleep $100 - \text{Mean score (SL1-SL4)} * 100 / 4 = \text{NOOS Sleep disturbance}$
4. Activity $100 - \text{Mean score (A1-A8)} * 100 / 4 = \text{NOOS Everyday activity and pain}$
5. Participation $100 - \text{Mean score (PT1-PT10)} * 100 / 4 = \text{NOOS Participation in every day life}$

NOOS profile

To visualize differences in the five different NOOS subscales and change between different administrations of the NOOS, a NOOS profile can be plotted

