

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

| | |
|----------------------------|--|
| TITLE (PROVISIONAL) | Is the work ability index useful to evaluate absence days in ankylosing spondylitis patients? A cross-sectional study. |
| AUTHORS | Meyer, Katharina; Niedermann, Karin; Tschopp, Alois; Klipstein, Andreas |

VERSION 1 - REVIEW

| | |
|------------------------|--|
| REVIEWER | Nick Bansback, School of Population and Public Health, University of British Columbia |
| REVIEW RETURNED | 21-Dec-2012 |

| | |
|------------------|---|
| THE STUDY | <p>1. The research question of the study needs to be better defined. Why measure the WAI to then estimate the number of absent days of patients, when you could just ask people the number of absent days? It seems an indirect and less accurate way of getting at the objective. A clearer objective needs to be made.</p> <p>2. The key messages include the statement "There is no valid measurement to assess absence days." However, this doesn't seem to be true as it ignores the study "Reilly, Margaret C., et al. "Validity, reliability and responsiveness of the Work Productivity and Activity Impairment Questionnaire in ankylosing spondylitis." <i>Rheumatology</i> 49.4 (2010): 812-819." which measures absent days in AS patients.</p> <p>3. What is the time frame for the WAI (past year?). If it is not the same as the time frame for the number of absent days, I am worried about the validity of this association.</p> <p>4. Is the measure of absent days related to AS or just general? It would be more relevant if these were days off due to AS, and not include days off due to general sickness which wouldn't be captured in the WAI.</p> <p>5. It would be helpful to discuss the accuracy of people's memory to report the number of work days missed in a previous year. I suggest at least referring and discussing "Severens, Johan L., et al. "Precision and accuracy in measuring absence from work as a basis for calculating productivity costs in The Netherlands." <i>Social science & medicine</i> 51.2 (2000): 243-249."</p> <p>6. It would be helpful to report in Table 2 the number of people with zero absent days and non zero absent days. Then, report the mean and median for the non zero group. If absent days are AS related (See point 4 above) then I suspect the number of zeros will be large. If so, this would mean a 2 stage model for the regression would likely be more appropriate (1st stage- logistic regression for zero vs non zero, 2nd stage linear for non zero)</p> <p>7. Connecting absent days to productivity costs is more complicated than the manuscript infers. To do so properly requires the consideration of the value of lost time, not simply multiplying wage by days lost. I suggest removing all reference to cost or economics in the manuscript. See "Zhang, Bansback, Anis. "Measuring and</p> |
|------------------|---|

| | |
|--|--|
| | valuing productivity loss due to poor health: a critical review." Social science & medicine 72.2 (2011): 185-192." for more information. |
|--|--|

| | |
|------------------------|---|
| REVIEWER | <p>Head Physiotherapy Research Unit Balgrist University Hospital Forchstrasse 340 CH-8008 Zürich Switzerland</p> <p>conflict of interest :After having a view at this manuscript I just what to inform you that I do know two authors of this article well.</p> |
| REVIEW RETURNED | 04-Jan-2013 |

| | |
|-------------------------|--|
| GENERAL COMMENTS | <p>This cross-sectional study evaluates absence days in ankylosing spondylitis patients with help of the work ability index. The study is well executed and, generally, the paper is well structured and well written.</p> <p>However, a part of the presented information is not yet clear. The below sections indicate issues that need to be addressed.</p> <p>Questions</p> <p>Page 3/ line 4 “ The WAI and other variables validly assesses incapacity for work.” Does the WAI assess incapacity for work or capacity of work</p> <p>Page 6 / line 24-31. All these different patient groups were tested with what result?</p> <p>Page 7 / line 29 or Page 10 /line7 Could you describe the group of patients “ankylosing spondylitis”? How were they selected? MRI, BASFI, BASDAI, Physical functioning, mSASSS, or BASRI? Could the authors provide some specific information on the patient group?</p> <p>Page 9/ line 28, What test was used to check for normality? What was the result of these tests? (page 10)</p> <p>Page 11/ line 38 What diagnosis are you referring to? I could not find the information.</p> <p>Page 11 / line 40 The sentence: “Because age and gender.... “. Does not belong in the result section. These should be in the Statistic section.</p> <p>Page 15 / line 4 The absence days were gathered retrospectively. This is a very important fact. This should be mentioned within the abstract. E.g. Page 2 / line</p> <p>FIGURES & TABLES are fine, I would like to see information about AS (MRI, BASFI, BASDAI, Physical functioning, mSASSS, or BASRI)</p> <p>This is an interesting work, thank you. This is a relevant contribution to assess the work incapacity (capacity) of patients with AS.</p> |
|-------------------------|--|

VERSION 1 – AUTHOR RESPONSE

Reviewer Nick Bansback, School of Population and Public Health:

1. The research question of the study needs to be better defined. Why measure the WAI to then estimate the number of absent days of patients, when you could just ask people the number of absent days? It seems an indirect and less accurate way of getting at the objective. A clearer objective needs to be made.

Answer: Perhaps our approach seems not very straight forward. But our approach was selected, because asking people the number of absence days may result in inaccurate answers due to part time work and partial incapacity of work. This is now described on page 6, lines 2-6. With respect to a clearer declaration of the scope of this study, we expanded the section “aims of the study” (page 7, lines 5-8) and the section on page 8, lines 17-21.

2. The key messages include the statement “There is no valid measurement to assess absence days.” However, this doesn’t seem to be true as it ignores the study “Reilly, Margaret C., et al. “Validity, reliability and responsiveness of the Work Productivity and Activity Impairment Questionnaire in ankylosing spondylitis.” *Rheumatology* 49.4 (2010): 812-819.” which measures absent days in AS patients.

Answer: We replaced the point „there is no valid measurement to assess absence days“ in the key messages. Furthermore, we changed the sentence on page 6, lines 8-12 and inserted a reference (Reilly et al.). We also adapted the sentence on page 17, line 12.

3. What is the time frame for the WAI (past year?). If it is not the same as the time frame for the number of absent days, I am worried about the validity of this association.

Answer: The WAI is a questionnaire about the subjective ability to work which encompasses the present situation, the situation about absence days over the past twelve month and some aspects of the future (page 9, line 8). Therefore, a part of the WAI covers a similar time frame like the QW. As a consequence, these two questionnaires reported the same time period.

4. Is the measure of absent days related to AS or just general? It would be more relevant if these were days off due to AS, and not include days off due to general sickness which wouldn’t be captured in the WAI.

Answer: The QW includes all absence days due to every health problem. Nevertheless, it differs between absence days related to AS and related to other health problems than AS (Table 2 and page 10, lines 3-5). The WAI is a self-assessment of the ability to work in terms of the general health condition, which may include several different health problems (e.g. AS, cancer and many others). The general absenteeism due to all health conditions including co-morbidities may be of additional interest from a public health perspective. The absence days which are estimated in this study by the help of a regression analysis, include all health conditions. In order to make things clearer, we added two sentences on page 9, lines 6-9.

5. It would be helpful to discuss the accuracy of people’s memory to report the number of work days missed in a previous year. I suggest at least referring and discussing “Severens, Johan L., et al. “Precision and accuracy in measuring absence from work as a basis for calculating productivity costs in The Netherlands.” *Social science & medicine* 51.2 (2000): 243-249.”

Answer: We discussed the accuracy of people’s memory to report the number of work days missed in a previous year. Page 17, lines 1-6 and reference “Severens et al”. The high proportion of disagreement in the Study of Severens et al. may base on an inconsistent reporting of partial absences due to a different understanding of the expressions. E.g. a patient, who is working only 50% of the working time because of health reasons, may report a half working day as a whole working day or in contrary as a whole absence day. An advantage of our study is that the QW asks very precisely for part time work, what may avoid misinterpretation and, therefore, lead to a more accurate reporting.

6. It would be helpful to report in Table 2 the number of people with zero absent days and non zero absent days. Then, report the mean and median for the non zero group. If absent days are AS related (See point 4 above) then I suspect the number of zeros will be large. If so, this would mean a 2 stage model for the regression would likely be more appropriate (1st stage- logistic regression for zero vs non zero, 2nd stage linear for non zero)

Answer: Our original model was a conditional model and aimed to make predictions only for people with absence days. Because the number of patients with no absence days at all was rather large, we decided in the originally manuscript to exclude the cases without absence days in a first step and, after that, to limit the regression analysis on the subgroup with absence days (n=58).

The proposition of the reviewer was to use a different approach. We have now extended the original conditional model to a non-conditional model.

In the first part the probability of absence days is estimated by a multiple logistic regression model. In the second part, the absences for the observations which have absence days are calculated by a multiple linear regression model. Based on these models an estimation of absence days can be calculated according to the following expression:

$$E(y_i|x_i) = \text{Prob}(y_i|x_i) * E(y_i|x_i, y_i > 0)$$

E= expected value

The changes due to the two-part model are included on page 2, line 14, page 11, lines 6-18, page 13, lines 18-23, page 16, lines 7-9, page 18, line 1 and Table 3.

7. Connecting absent days to productivity costs is more complicated than the manuscript infers. To do so properly requires the consideration of the value of lost time, not simply multiplying wage by days lost. I suggest removing all reference to cost or economics in the manuscript. See "Zhang, Bansback, Anis. "Measuring and valuing productivity loss due to poor health: a critical review." Social science & medicine 72.2 (2011): 185-192." for more information.

Answer: The last keyword on page 1, line 19 is cancelled and the sentence in the conclusions of the abstract is changed (page 3, lines 1-3). The key messages are adapted (page 4, lines 7-11). We weakened the statement about the costs on page 16, lines 10, 11. We also adapted the sentences on page 17, lines 18-20 and cancelled the sentence on page 18, line 3 and we added the reference of Zhang et al.

Reviewer Head Physiotherapy Research Unit Balgrist University Hospital:

1. The WAI and other variables validly assesses incapacity for work." Does the WAI assess incapacity for work or capacity of work

Answer: The WAI originally assesses ability to work. In this study the WAI and other variables were introduced as independent variables in a regression equation to estimate absence days as a measure of incapacity for work. To make this difference more clear, we changed the sentence on page 3, lines 2, 3.

2. All these different patient groups were tested with what result?

Answer: The results of the reliability and validity are now described in detail and on page 6, line 15-22. The feasibility of the use of the WAI as an outcome measurement in different patient groups is described on page 6, lines 22-24 and page 7, lines 2-3.

3. Could you describe the group of patients "ankylosing spondylitis"? How were they selected? MRI, BASFI, BASDAI, Physical functioning, mSASSS, or BASRI? Could the authors provide some specific information on the patient group?

Answer: We improved the description of the sample: we added on page 8, line 3 "all" and included AS-specific variables (page 12, line 3-6, references 24-27 and Table 1). Not every patient had a MRI, but every patient had an x-ray of both sacroiliac joints with a manifested arthritis of the sacroiliac joints, grade II-V. This is according to the modified New York criteria which served as the inclusion

criteria of the study. This is described on page 8, line 8. For that reason we did not collect data about the BASRI.

4. What test was used to check for normality? What was the result of these tests?

Answer: We checked the graph of the normal curve and further, we computed the skewness and kurtosis to test for normality. The skewness and the kurtosis (when using SPSS) should be near zero (e.g. smaller than +/-0.5), and the standard deviations of its means should be within the interval +/- 2. The skewness of the absence days is now clearly declared on page 12, line 13 "Table 2". We added on page 12, lines 16-18, that we only used the mean values of the absence days to allow for comparison with other studies, although the data were skewed.

5. What diagnosis are you referring to? I could not find the information.

Answer: One item of the WAI score asks every disease of the single subject. There are fourteen different categories of illnesses, with a maximum score of fourteen for this item. The mean (SD) of this score was in our study 2.6 (1.4). The minimum included one (AS only) and the maximum seven different diagnoses (which makes six different "comorbidities"). We now described this item in the methods (page 9, lines 8-9). For the analysis we divided the comorbidities into a variable with 0 to 1 and >2 other diagnosis than AS (page 14, line 1).

6. The sentence: "Because age and gender.... ". Does not belong in the result section. These should be in the Statistic section.

Answer: The sentence is replaced to page 11, lines 20, 21.

7. The absence days were gathered retrospectively. This is a very important fact. This should be mentioned within the abstract.

Answer: We explained more clearly that the absence days are gathered retrospectively (abstract page 2, line 13, page 8, line 17 and page 9, line 4).

8. FIGURES & TABLES are fine, I would like to see information about AS (MRI, BASFI, BASDAI, Physical functioning, mSASSS, or BASRI)

Answer: We added AS specific variables to the Table 1 to describe the sample better. Physical functioning is described with the BASFI. Nevertheless, we did not collect data about the mSASSS.

Additionally, we have made some minor changes (only single expressions) that are also highlighted in yellow. We numbered the pages and lines using the Microsoft-software (Word) which is hopefully in accordance with the system for the submission.