Author's response to reviews

Title: Determinants of satisfaction 1 year after total hip arthroplasty: the role of expectations fulfilment

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Author's response to reviews: see over
Dear Editor,

Please find enclosed the revised manuscript now entitled "Determinants of satisfaction 1 year after total hip arthroplasty: the role of expectations fulfilment" with and without track changes. As you will see, we used two different colors to distinguish the language corrections from the other revisions.

This is our answer to reviewer:

**Major revisions**

1. **At this point, my main concern is the association between predictors and outcomes.** Fulfillment of expectations following hip replacement, changes in disease-specific and generic PROMs and satisfaction with the results of the intervention are all outcomes that are expected to correlate. In particular, a strong relation between satisfaction and fulfillment of expectations is intuitive. I understand the authors aim to investigate how fulfillment of expectations influences satisfaction, and if so, draw the conclusion that efforts should be made to infuse patients with realistic expectations in order to receive high satisfaction.

   **However, the construction of regression models with outcome variables as predictors is problematic. The basic principle for a regression model is that the predictors must be measured or known before the exposure. This concern must be addressed properly.**

To our knowledge, there are 2 types of regression model: 1) the predictive model, that aims to predict other observations and where explicative variables are predictors (and so must be measured before the exposure); 2) the explanatory model, that aims to explain a phenomenon and where explicative variables are all parameters that could be associated with this phenomenon.

In the current study, models 1 correspond to predictive models, and models 2 to explanatory models. Models 1 aim to predict satisfaction (or expectations fulfilment) after THA; that's why we included as explicative variables only preoperative parameters (= predictors). Models 2 aim to explore which pre- and postoperative parameters are associated with satisfaction (or expectations fulfilment). Even if it is intuitive that postoperative parameters, particularly expectations fulfilment, are strongly associated with satisfaction, some authors are not convinced and hypothesize that preoperative expectations level or postoperative functional outcome are the only factors associated with satisfaction (see the third paragraph of the
introduction). This explains why we also used models 2.

Regarding the validity of the model, the fulfilment score correlates with satisfaction ($r=0.63$), as do the other postoperative parameters. However, the main statistic problem can be the correlation between the explicative variables. As you can see in the following table, that shows the correlation between the fixed effects of model 2 (explanatory model for satisfaction), the strongest correlation concerns the different variables used to assess function, that is postoperative womac (pst_wm), postoperative SF12 PCS (post_SF12_pcs) and a residual limp (boite).

<table>
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<th></th>
<th>(Intr)</th>
<th>age</th>
<th>SF12_MCS</th>
<th>post_SF12_pcs</th>
<th>pst_wm</th>
<th>score</th>
<th>boite</th>
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<tbody>
<tr>
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<tr>
<td>post_wm</td>
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<tr>
<td>score</td>
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<td>0.382</td>
<td>-0.480</td>
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<tr>
<td>boite</td>
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</tr>
</tbody>
</table>

We made another model keeping postoperative womac (pst_wm), and eliminating postoperative SF12 PCS (post_SF12_pcs) and a residual limp (boite); the results were not changed.

We modified the statistical analyses section and several points of the manuscript to make this point clear.

2. **It could be helpful if the authors provide a direct acyclic graph (DAG) to illustrate relationships between predictors, exposure and outcomes.**

This was done (see figure 2)

3. **A factor not studied is how mismatch between surgeons and patients preoperative expectations predict outcomes. Results presenting associations between mismatch of expectations and outcomes could potentially be very useful.**

The mismatch between surgeons and patients preoperative expectations did not predict
postoperative satisfaction. We added this information in the table 2 and in the result section: "The mean difference between patients' and surgeons' preoperative THR survey did not differ between the two groups". As p>0.2, this parameter was not considered for multivariate analysis. The difference between patients' and surgeons' preoperative expectations for items of the THR survey was already described and discussed in a previous work (see Jourdan et al, Plos One 2011).

4. The first objective is adequately defined but the second objective is unclear. Needs to be redefined. The objective was redefined: "The first objective of this study was to identify preoperative predictors and postoperative determinants of satisfaction one year after THA, including patients' and surgeons' expectations, and the second was to identify predictors and determinants of expectation fulfilment."

The abstract was also modified in this way.

5. The title does not adequately convey what has been found although it conveys what has been studied. The title was changed and replaced by: "Determinants of satisfaction 1 year after total hip arthroplasty: the role of expectations fulfilment".

Minor revisions

1. The two first sentences in the strengths and limitation section do not really discuss particular strengths of the study and I suggest these sentences should be removed. The result per se is not a strength.

The two first sentences in the strengths have been removed.

Quality of written English: Needs some language corrections before being published

The article has been reviewed and corrected. To distinguish the language corrections from the other revisions, 2 different colours have been used.
Sincerely,

Clémence Palazzo MD