**Author’s response to reviews**

**Title:** Association between fatigue, motivational measures (BIS/BAS) and semi-structured psychosocial interview in hemodialytic treatment

**Authors:**

Michela Balconi (michela.balconi@unicatt.it)

Laura Angioletti (laura.angioletti@gmail.com)

Daniela De Filippis (daniela.defilippis@unicatt.it)

Maurizio Bossola (maurizibossola@gmail.com)

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**Author’s response to reviews:**

Dear professor Harris,

Thank you for your answer. We have revised the paper taking into account Reviewers’ suggestions.

We included a response to the Reviewers (5 pp.), that reports our answers. Changes introduced in the text were underlined in yellow colour.

Waiting for other requests you may wish to make.

Sincerely,

Angioletti Laura

Department of Psychology
Catholic University of Milan
Largo Gemelli, 1
20123, Milan, Italy
Phone: +39-2-72345929
e-mail: laura.angioletti@gmail.com

Response to reviewers reports:
We would like to thank the reviewers for this opportunity to improve our work for BMC Psychology. You can find below a point-to-point answer to each of your comments.

Nicole Rascle, Ph.D (Reviewer 1): It is an interesting topic but this paper must be improved. The authors have to clarify and explain hypotheses, variables, method and results. We have to see more information about data analysis, results section and background in discussion section.

Several comments:

Background:

The authors mentioned (p.5)"few qualitative studies focused on individual experiences of patients on chronic hemodialysis". It is not true. A lot of references were forgotten: Jonasson & Gustafsson, 2017; Clarkson and Robinson, 2010; Makaroff, 2012; Stringer and Baharani, 2012; Karamanidou, Weinman and Horne, 2014; Schell et al., 2012; Xhulia et al., 2015; Chiaranai, 2016; Rezaei, Jalali, Jalali c, Khaledi-Paveh, 2018; Reid, Seymour and Jones, 2016 in the same way this paper is not present: "a thematic synthesis of the experiences of adults living with hemodialysis" by Reid, Seymour and Jones, 2016.

R: Thanks for this comment, we added relevant references to our literature background, and we revised it.

Method:

Sample: we can observe a large standard deviation in participant's dialytic mean age in months, it is potentially a limit of this study because other studies have shown that duration of hemodialysis is a central determinant of this experience. The authors have to explain the choice to include patients in the study after 12 months of hemodialytic treatment.

R: Indeed, studies on prevalent hemodialysis patients usually include patients with at least 6 months of treatment or, as in the case of our study, with at least one year of treatment. It is common to find a large standard deviation in participant's dialytic mean age as we can have patients that have started hemodialysis since one year as well as patients that have started hemodialysis since 30 years. But, this is the "real life" and if we wish to study a hemodialysis sample/population we have to include patients with all dialytic ages (with at least one year of treatment). In addition, we are aware that in some studies dialytic age has been associated with fatigue but it is also true that in other did not. For instance, we have recently found in a large multicentre study that age and dialytic age were higher in patients with severe post-dialysis fatigue, but at multivariate analysis, post-dialysis severity was associated with ADL only, and not with dialytic age (Bossola et al. Nephrology (Carlton). 2018; 23:552-558). Previously, we found that “the correlation analyses showed that the score of the SF-36 Vitality subscale was associated with age, dialytic age, TIRD, ADL, IADL, CCI, BDI, HARS, MMSE, serum urea,
creatinine, albumin, and IL-6 levels. On multivariate general linear model analyses, with fatigue as the dependent variable and gender as a second factor, BDI and serum IL-6 levels only were independently associated with the score of the SF-36 Vitality subscale" (Bossola et al. J Pain Symptom Manage. 2015; 49:578-8).

Data analysis

The authors do not explain why and how they convert answers to each question into nominal or quantitative ratings.

R: We converted answers to each question into quantitative ratings in order to apply statistical analyses and draw conclusions based on statistical evidences. The main steps were:

- We used the method of “agreement between judgments” to determine the topics
- successively we obtained specific quantitative measures for each item included in that specific topic, considering the specific questions and answers that subjects furnished for that topic.
- In some cases, the specific answer was “yes/no”, therefore we used a dicothomic measure (nominal ratings); in other cases, the answer was quantified on continuous scale (likert scale), therefore we used quantitative ratings.

The authors do not comment descriptive data of the study participants (questionnaire results)/cut-off, mean,…

R: We added a paragraph and a table with a description of questionnaire results within the results section.

How is data used from BDI and STAI questionnaires, laboratory parameters?

R: These data were used to define patients profile for descriptive purposes.

Why are trait and state anxiety measured?

R: We measured this dimension for describing patients characteristics.

How are evaluated "interference of the HD treatment in social life, the importance of family understanding of patient situation"? Why are they not included in the 8 topics?
R: These two components were structured questions included in the third main area of the semi-structured interview related to socio-relational aspects. Patients were requested to provide a quantitative answer to these two questions on a Likert scale from 1 to 5.

Results and discussion

(P.13) Authors write "the sample was split according to the gender variable": justify why; did you have any hypotheses?

R: We added assumptions in the introduction to discuss this result.

Indeed, former findings suggested it is necessary to consider gender-related characteristics in attempting to uncover the neurobiological substrates of BIS/BAS, which is also important to develop a more complete understanding of the shared factors that influence BIS/BAS functioning and related behavioral outcomes (Li et al., 2014; Soutschek et al., 2017). Moreover, gender has been suggested to be a moderating variable in the ability to resist to fatigue between males and females: a greater resistance to fatigue seems to be presented by females when compared to males in chronic condition (Bensing, Hulsman, & Schreurs, 1999).

Thus, we hypothesized possible gender differences in the relation between BIS/BAS and FSS to emerging psychosocial outcomes. No differences were instead hypothesized and detected in scale results (Table 3).

In the discussion section, it lacks comparison between present results and those of Reid, Seymour and Jones, 2016 / topics

R: A descriptive comparisons between our interview topics and Reid, Seymour and Jones (2016) four analytic and descriptive themes was provided.

Authors write "The reason why gender variable can be considered as a mediating variable between fatigue and reward system…” would you rather say "moderating " variable?

R: Thanks for the indication, we specified “moderating”.

Haikel A. Lim, MSc (Reviewer 2): Thank you for the opportunity to review this manuscript, which describes a mixed-methods investigation into fatigue and motivation of patients undergoing hemodialysis. I have a few suggestions that I hope would improve the quality of the manuscript for BMC Psychology.
The Background/Introduction of this manuscript is confusing, in part because the authors have focused both on giving an overview of mixed-methods and qualitative work and its importance (not really necessary in a Psychology journal), as well as trying to formulate a basis for their research (more essential). Unfortunately, neither of these aspects come across clearly, and as readers we are left wondering what exactly the study is planning on doing, or what lacuna it is trying to address. The manuscript may benefit from a revision of the entire introduction, and as I see it, I would suggest the following flow or something similar:

- Patients undergoing hemodialysis experience a significant amount of fatigue (it may be helpful to also explain post-hemodialysis fatigue and the hemodialysis regimen so readers get a better idea). Fatigue significantly negatively influences QOL and other associations, etc. The etiology of fatigue is multifactorial. (I would suggest the authors review also Joshwa, B., & Campbell, M.L. (2017). Fatigue in patients with chronic kidney disease: Evidence and measures. Nephrology Nursing Journal, 44(4), 337-343.) Work in other chronic conditions has suggested that fatigue can be divided into central and peripheral, and is mediated by inflammation. The inflammatory processes have also been shown to influence the basal ganglia. Therefore it may be postulated that motivation systems may underpin the understanding of (mediate? moderate?) the relationship between fatigue and its sequelae (again I would caution the authors from being definitive here because the research they are citing is purely observational and not causative, and any neurologist or neuropsychiatrist can tell you that motivation itself is multifactoral and may be under more frontal control than just limbically-oriented).

- If the authors have just gone on to describe the quantitative aspect of their study, this would make sense. However, given that there is a qualitative aspect, the authors need to justify the inclusion of this. In other words, it is not important for the authors to describe why exactly a mixed-methods study is better than either a quantitative or qualitative, or why qualitative interviews are important to elicit patient experiences; it is important instead for the authors to highlight how the qualitative component fits into this idea of identifying the associations between fatigue and motivation, and what more it can contribute. What is the larger question the qualitative semi-structured interviews are actually getting at and asking, and how does it fit into this larger study? For example, it might be the case that because this postulation is new, or just based on observational data, it is important to ground the potential associations in qualitative findings. There needs to be a better theoretical foundation for this manuscript should it be published in BMC Psychology.

The objectives of the study, and then the hypotheses, all in relation to the lacunae identified, should be clearly stated.

R: We revised the whole introduction taking into account these precious suggestions and we followed the advised flow.

In light of this, the Abstract also needs to be reviewed to clearly state not only the lacuna, but also the objectives and if possible the hypotheses.

R: We inserted assumptions and objectives to the Abstract.
I would also recommend that the authors review the manuscript for grammatical errors; alternatively, the manuscript may benefit from proofreading by a native English speaker.

R: The manuscript was reviewed for grammatical errors and overall readability.

I highlight some examples:

- "Quality of Life" in line 48 should just remain uncapsitalised, i.e. "quality of life".
R: It was changed.

- Not sure what the authors are suggesting by using "should" in line 52; I suggest using "might" or "may", or eliminating this qualifier altogether given that past research has suggested the inclusion of both these systems.
R: It was replaced.

- Removal of "evidences of" in line 53.
R: It has been removed.

- Unclear what "requiring self-motivation" actually means in this context.
R: Thanks for the suggestion, we deleted it for avoiding possible misunderstanding.

- "On the other side" in line 66 may be better represented as "On the other hand" or something equivalent.
R: It was changed.

- Lines 78-82 are colloquial and in general can be better worded.
R: The whole introduction was modified, these lines included.