PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Prevalence of Anxiety and Depressive Symptoms among Medical Residents in Tunisia: A Cross-Sectional survey
AUTHORS	Marzouk, Mehdi; Ouanes-Besbes, Lamia; Ouanes, Islem; Hammouda, Zeineb; Dachraoui, Fahmi; Abroug, Fekri

VERSION 1 – REVIEW

REVIEWER	Kristin Lo Monash University Australia
REVIEW RETURNED	19-Dec-2017

GENERAL COMMENTS	Thank you for the opportunity to review this interesting study specific to Tunisian medical residents. I have provided some suggested changes in the attached file. There is some assumed knowledge that needs to be expanded upon for an International audience. In general, while a few terms need to be expanded upon, the writing could be made more succinct. I can understand that there are a number of underlying emotive situations here - however this could be conveyed with different descriptive words. The manuscript could compare and contrast more with the literature and could discuss more limitations and future research. I note the use of median and IQR for continuous variables and wonder whether mean and SD might be better statistics to use. You could potentially go into more detail about each variable that was found to impact on depression / anxiety and discuss more strategies for addressing each of these ie: could wellbeing courses be a valuable addition? What is going to happen as a result of this research - what do regulation bodies need to know, how are you going to disseminate these findings to them? What is the Tunisian policy regarding night shifts? It seems that more is discussed about depression than anxiety as compared to the literature - you could also discuss further why you think there are differences between your cohort and the International norms. Have international studies used the HADs as that would be interesting to compare given the definitive and less definitive criteria of the scale. Other studies that I am familiar with state more definitive criteria for depression / anxiety eg: when it is definitely present not when they are doubtful. If definitively present then your data is very similar to the International data presented. Does the data you are comparing to present these doubtful occurrences? What I liked was that you are exploring a very topical and important area that has potential to significantly impact on the future of medical residents. All the best with your manuscript.

REVIEWER	Angele McGrady Ph.D. LPCC Professor, Department of Psychiatry University of Toledo, Toledo, Ohio USA
REVIEW RETURNED	19-Feb-2018

GENERAL COMMENTS	Overall comments. This is study in survey format of medical residents who are brought together to choose their medical specialty. The number of participants is adequate to answer the question posed – which is to determine the prevalence of anxiety and depression in these residents. The instrument chosen – the Hamilton anxiety and depression inventory is appropriate for this survey. The language of the survey did not seem to be a barrier to the residents' completion of the survey, because that is the language of all medical studies in the country. There was no consent form because the survey was anonymous. I think the paper contributes something to the literature in this very important area of research. There are several areas where the English is a problem, so I will highlight these below. Abstract: Line 26: is willing the correct word? As I understood the system, residents are ranked and depending on the rank, are placed into specialties (line109). 44-45 conclusion goes beyond the data. There is no proof in this paper that these residents will continue to experience symptoms after residency since this was a one time survey Introduction line 74 mutation seems to be the wrong word here – say political changes or changes Methods line 129-130 and lines 132-133: what does "the operation" mean? Should this say the process? Lines 138-146. I don't see psychiatry listed. Is there no specialty in psychiatry? If that is correct, it should be stated for the benefit of the international audience. Line 147. Insert the timeline for the questions asked in the survey instrument. Either past two weeks, past week or today. This makes a difference in interpretation Line 155: cases is not the best word; suggest something like – screen positive or positive for depression and possible or probable for depression Discussion I suggest that you focus on the definite classes and downplay the doubtfuls. The results are strong enough for the definite group and higher than the international samples (line 254). Lines 234-237. Insert what the guidelines from the national medical board are for the hours that the residents are allowed to work. This will help put the hours into perspective. For example, in US, there are requirements for the residency program to work residents certain number of hours per week and no more. Lines 238-240 unclear and needs revision – caregivers is not the best work – suggest medical professionals who care for others.. Lines 269-271. This study is not longitudinal, but a one time survey. I don't know of studies that have tracked medical students into their residency and into practice. There are studies of resident and physician burnout but I am not aware of residents being followed long term and assessed at intervals. So these sentences need to be revised. Lines 281 ff. It should be suggested that the next study would identify the residents so that they could be given their information so that they could act on it. You can also suggest that specific training programs offer programs to prevent or decrease burnout. Line 285-287. I suggest you delete the last sentence as it is way beyond the scope of this paper. Table II. Some of the p values are listed as < and others do not have the symbol. Make them all consistent

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Kristin Lo

Institution and Country: Monash University, Australia Competing Interests: None declared

Thank you for the opportunity to review this interesting study specific to Tunisian medical residents.
I have provided some suggested changes in the attached file.

All suggested changes in the attached file have been taken into account and the modifications made accordingly. More in detail:

1- The first sentence in the introduction section which seemed complex has been reworded to make it easier to understand (page 3, lines 56-57)
2- Reviewer asked for an explanation of the Arab spring and references for the sharp deterioration in resources / frustration of the population. A paragraph has been added in order to explain the Arab spring and give figures on the deterioration on the quality of life of Tunisians (page 3, lines 70-79)
3- Details on the route from medical entry to the end of resident training have been added as requested (page 4, lines 94-99)
4- The word “draconian” has been changed to “tight”
5- Words under ten have been spelled out in full, as suggested.
6- The sentence deemed to express emotions has been removed (page 5, lines 134-137).
7- The sentence deemed complex has been reworded and the word “operation” has been changed (page 6, lines 137-139).
8- For clarity, we have changed "degree of difficulty by" associated workload " to explain the classification of groups of specialties (page 6, lines 145-152)
9- “Compensatory rest” has been changed to “a day of safety rest” throughout the manuscript and associated tables
10- The second paragraph of the discussion section has been reworded in order to make it clearer. The remark on language mastering has been taken into account (page 10, lines 244-250).
11- Benchmarking with similar international studies has been clarified specifying comparisons according to the definite or doubtful nature of depression (page 10, lines 252-256).
12- Changes has been made as suggested regarding the importance of the study (page 11, line 280)

There is some assumed knowledge that needs to be expanded upon for an International audience. In general, while a few terms need to be expanded upon, the writing could be made more succinct.
I can understand that there are a number of underlying emotive situations here - however this could be conveyed with different descriptive words.

We share the reviewer's opinion recommending that emotive expressions should be avoided. We follow her recommendations in the specific places pointed to in the attached document, and more generally in the rest of the manuscript, avoiding the use of adjectives expressing a judgment or bias.

The manuscript could compare and contrast more with the literature and could discuss more limitations and future research.

We agree with reviewer that more comparisons would be useful with literature from similar countries, or literature using similar instrument for anxiety-depression measurement. This is also the remark of the 2nd reviewer. We have therefore added a paragraph in which comparisons are made with studies from similar countries (Lebanon, Saudi Arabia; page 11, lines 263-268), and a study that used HAD as a measurement tool (page 10, lines 259-262).

I note the use of median and IQR for continuous variables and wonder whether mean and SD might be better statistics to use.

Reviewer is right to raise the issue of whether Means (SD) should be used instead of medians (IQR) for continuous variables. Based on your suggestion, changes are made where appropriate (tables and results) and we add a sentence in the statistical analysis section (page 7, lines 171-173) “Continuous variables are expressed either as means ± Standard Deviations or medians and inter-Quartile Ranges (IQR), according to normal or skewed data distribution.”

You could potentially go into more detail about each variable that was found to impact on depression / anxiety and discuss more strategies for addressing each of these ie:

could wellbeing courses be a valuable addition?

What is going to happen as a result of this research –

what do regulation bodies need to know,
how are you going to disseminate these findings to them?
What is the Tunisian policy regarding night shifts?

Following the reviewer's recommendation, we analyze the measures that should be taken to reduce the impact of the risk-factors uncovered in the current study. These factors are both of an individual nature (thus, requiring personal efforts; page 12 lines 296-304), and those pertaining to the general organization of residents' work.

We report here that for many of these factors (number of working hours and shifts /week, safety rest etc.), there was shared awareness (between residents and decision makers) of the necessity of acting in the direction of improvement. An agreement has just been reached between the stakeholders (page 12, lines 305-315).

We think that this new paragraph answers (for a good part) the comments of both reviewers on the use we intend to make of the results of the present study.

It seems that more is discussed about depression than anxiety as compared to the literature - you could also discuss further why you think there are differences between your cohort and the International norms.

This remark is in keeping with the former on the relevance of comparisons with existing literature. Some new comparisons have been added.

Have international studies used the HADs as that would be interesting to compare given the definitive and less definitive criteria of the scale. Other studies that I am familiar with state more definitive criteria for depression / anxiety eg: when it is definitely present not when they are doubtful. If definitively present then your data is very similar to the International data presented. Does the data you are comparing to present these doubtful occurrences?

Reviewer is right to suggest that comparisons should be more meaningful when the instrument used for the diagnosis of anxiety/depression is identical to the one we use. We add a comparison with a study conducted in Switzerland and using the HAD questionnaire. This study disclosed lower rates of both anxiety and depression in residents (page 10, lines 259-262 "A prospective cohort study conducted in Switzerland and using the HAD inventory used in our study disclosed a prevalence of 30% anxiety symptoms in the second year residents, and 20% in the fourth and sixth year residents; depression symptoms were present in 15% and 10%, respectively[26]."

What I liked was that you are exploring a very topical and important area that has potential to significantly impact on the future of medical residents.

All the best with your manuscript.

We thank the reviewer for her overall positive appreciation of our work and the effort made to try to make it better.

Reviewer: 2

Reviewer Name: Angele McGrady Ph.D. LPCC Professor, Department of Psychiatry Institution and Country: University of Toledo, Toledo, Ohio USA Competing Interests: None declared

Overall comments. This is study in survey format of medical residents who are brought together to choose their medical specialty. The number of participants is adequate to answer the question posed – which is to determine the prevalence of anxiety and depression in these residents. The instrument chosen – the Hamilton anxiety and depression inventory is appropriate for this survey. The language of the survey did not seem to be a barrier to the residents' completion of the survey, because that is the language of all medical studies in the country. There was no consent form because the survey was anonymous. **I think the paper contributes something to the literature in this very important area of research**. There are several areas where the English is a problem, so I will highlight these below.

Abstract:

Line 26: is willing the correct word? As I understood the system, residents are ranked and depending on the rank, are placed into specialties (line109).

Following reviewer's remark, the word "willing" has been replaced

44-45 conclusion goes beyond the data. There is no proof in this paper that these residents will continue to experience symptoms after residency since this was a one time survey

Reviewer is right to emphasize that the assertion on the persistence of symptoms beyond residency is only speculative. The conclusion of the abstract has been changed accordingly . We read now page 2 lines 43-47"Tunisian residents experience a rate of anxiety/depression substantially higher than that reported at the international level. This phenomenon is worrying as it has been associated with an

increase in medical errors, work dissatisfaction and attrition. Means of improving the well-being of Tunisian residents are explored, emphasizing those requiring immediate implementation"

Introduction line 74 mutation seems to be the wrong word here – say political changes or changes
Changes have been made as requested "major socio-economic and political changes"

Methods line 129-130 and lines 132-133: what does "the operation" mean? Should this say the process?
Reviewer is right to suggest changing the word "operation". The sentence has been reworded and the word removed.

Lines 138-146. I don't see psychiatry listed. Is there no specialty in psychiatry? If that is correct, it should be stated for the benefit of the international audience.
Following reviewer's suggest, we list a greater number of specialties in each of the 4 categories identified and psychiatry appears in the medical specialties.

Line 147. Insert the timeline for the questions asked in the survey instrument. Either past two weeks, past week or today. This makes a difference in interpretation
Following reviewer's suggestion we add the following sentence in the methods section "Participants were told that the questions asked relate to their psychic state during the last two weeks."

Line 155: cases is not the best word; suggest something like – screen positive or positive for depression and possible or probable for depression
Following reviewer's remark we change the sentence which reads as following "Two cutoff scores are validated for detecting anxiety and depression, namely 11 for participants who screen positive for anxiety/depression and 8 for probable anxiety/depression"

Discussion I suggest that you focus on the definite classes and downplay the doubtfuls. The results are strong enough for the definite group and higher than the international samples (line 254).
Reviewer is right in advising a focus on definite cases, as long as the results are already strong and comparisons with studies using other types of measurement scales may not be fully consistent. Hence, comparison with published studies focus on definite cases. In page10 lines 252-256 we read now "Estimates of the prevalence of depression or depressive symptoms among resident physicians vary from 3% to 60% with a median of 28.8% according to a recent meta-analysis of 54 studies, a proportion that is lower than that recorded in our study whether we only consider the rate of definite depression, or when we add the additional cases qualifying for doubtful depression

Lines 234-237. Insert what the guidelines from the national medical board are for the hours that the residents are allowed to work. This will help put the hours into perspective. For example, in US, there are requirements for the residency program to work residents certain number of hours per week and no more.
Until the bylaw published in March 9, 2018, the working hours of the residents were not precisely delimited. The overall schedule is modeled on that of the public service (6-8 hours / day), but the shift frequency was unlimited, and not followed by a safety rest (unless some exceptions).
We add a paragraph at the end of the discussion highlighting the contribution of this new bylaw whose content was one of the objects of the struggle of the different generations of residents, and only materialized after the strikes of recent weeks. We read in page12 lines 305-312"While these details were totally non-existent in Tunisia, this has been recently defined through the promulgation on March 9, 2018 of the bylaw regarding the status of Tunisian interns and residents[35]. This promulgation, which has been obtained following difficult negotiations, and a strike that lasted more than 6 weeks, defines for the first time the role and duty of residents. The maximum number of weekly working hours and that of shift frequency have been clearly defined and have been reduced to a maximum of 40 hours and two per week, respectively. A security rest following every shift has been rendered mandatory."

Lines 238-240 unclear and needs revision – caregivers is not the best work – suggest medical professionals who care for others..
Change has been made as suggested and the sentence has been reworded as suggested to read in page 10 lines 244-246 "Although, mood disorders and physician distress (such as burnout and

depression) are more prevalent among medical professionals compared to general population, information is lacking about their prevalence in Tunisia"

Lines 269-271. This study is not longitudinal, but a one time survey. I don't know of studies that have tracked medical students into their residency and into practice. There are studies of resident and physician burnout but I am not aware of residents being followed long term and assessed at intervals. So these sentences need to be revised.
We agree with the reviewer that the lack of longitudinal follow-up does not allow us to be assertive about the persistent or transitory nature of mood disorders. We still quote the literature that suggests that these disorders can be sustainable: page 11, lines 282-283. Changes have been made as suggested. We read now "It has been shown that once present, depression as well as burnout may persist throughout the whole residency duration, or even beyond [29] [30]"

Lines 281 ff. It should be suggested that the next study would identify the residents so that they could be given their information so that they could act on it. You can also suggest that specific training programs offer programs to prevent or decrease burnout.
We share reviewer's concern that the results of the present study should help residents at the individual level but our study was not designed this way. Accordingly we make a recommendation as suggested that future studies should be able to communicate personal information so that residents could act on it. Page 12 lines 296-304 we read "The resident physician should first be aware of the mental problem and seek help in particular those with previous personal history of depression[34]. We did not investigate whether the participating residents sought for, or actually had psychological counseling, but we strongly believe that most did not. More generally, accepted risk factors such as age, gender, marital status, stressors outside work, sleep deprivation, or lifestyle, require more personal attention[4]. The current study was not designed to allow participants' identification so that they could be given individual information and act on it. Future studies targeting preferentially residents (or specialties) at high risk of anxiety, depression, or burnout, should consider such feedback for more specific training programs."

Line 285-287. I suggest you delete the last sentence as it is way beyond the scope of this paper.
The sentence has been deleted as requested
Table II. Some of the p values are listed as < and others do not have the symbol. Make them all consistent
Changes have been made as requested.

VERSION 2 – REVIEW

REVIEWER	Kristin Lo Monash University, Australia
REVIEW RETURNED	22-Apr-2018

GENERAL COMMENTS	You have definitely improved this revision however there are still some areas that need addressing. See attached document. Most significantly the discussion still needs to be re-ordered and discussed in more detail (about both depression and more about anxiety) so that it leads on to the areas that need addressing - it seems to mention the areas that could be addressed but not go into specifics. Could there be lifestyle education etc. Thank you and all the best

VERSION 2 – AUTHOR RESPONSE

Reviewer's Comments to Author:

Reviewer: 1

Reviewer Name: Kristin Lo
Institution and Country: Monash University, Australia Competing interests: None declared

1-You have definitely improved this revision however there are still some areas that need addressing. See attached document.
A1-We thank the reviewer for her positive appreciation of the previous revision to the manuscript
2-Most significantly the discussion still needs to be re-ordered and discussed in more detail (about both depression and more about anxiety) so that it leads on to the areas that need addressing - it seems to mention the areas that could be addressed but not go into specifics. Could there be lifestyle education etc.
A2- Following reviewer's comment we discuss in more detail depression (for which there is more literature), and anxiety. We have reserved a long paragraph where we propose potential corrections to the current situation (page 12, lines 292 through 322). More particularly on areas that need to be addressed we add the following paragraph in the discussion section (page 12, lines 301-304): "Structures able to provide aid to health professionals exposed to and suffering from stress, anxiety, depression, are anyway non-existent in Tunisian hospitals. Our study suggests that such structures can no longer be considered an option, but the Ministry of Health should provide support at institutional level."
Thank you and all the best
See file attached

In the attached document:
Q1- Was this people with anxiety and depression coexisting, or was it all people with the diagnosis of depression OR anxiety? (abstract: line 37)
R1- We share Reviewer's concern that the use of "symptoms of anxiety-depression" lacks precision and might be misleading when we use Poisson regression. This generalized linear model tells indeed which explanatory variables have a statistically significant effect on the response variables that are counts (namely the HAD score here).
For clarity and precision, we replace "symptoms of anxiety-depression" by "Total HAD score" in the abstract (page 2, line 37), in the results section (page 9, lines 220-221), and in the first paragraph of the discussion section, page 10, line 236). In the statistics section we further explain why we use Poisson regression as a generalized regression model in the statistics section (page 7, lines 177-178) where we read now "We used multivariable Poisson regression to identify explanatory variables with a statistically significant effect on the total HAD score".
Q2- Sometimes you mention burnout and sometimes not might need to define. Outcome measures looks at anxiety and depression (Introduction, page 3, line 59)
R2- Outcome measures look at anxiety and depression indeed, but burnout is used here as an example of mood disorders, as we quote references (5 and 6), on anxiety, depression, and burnout.
Q3- This needs to come earlier as it's almost a given by this point
R3- Changes have been made as suggested and this sentence now appears earlier in the introduction (page 3, line 62).
Q4- I should have mentioned this earlier but this needs explanation please
R4- We provide the following explanation to "Arab spring" in page 3, lines 73-76: "Arab spring was a series of anti-government protests, or armed rebellions ignited in Tunisia by the so-called "Jasmine revolution" which spread across North African countries and in the Middle East. It is seen as the translation of peoples' aspirations to democracy, and to replace dictators in place."
Q5- Are both these sentences supposed to be about the public sector as the second sentence seems like it is not needed (page 4, line 91)
R5- The second sentence is not needed indeed, and has been deleted
Q6- Combine this with the next paragraph so not a single sentence paragraph.
R6- This sentence has been combined with the following paragraph, as advised.
Q7- This sentence is long and I'm not sure about the second half of the sentence or your definition of

baccalaureate. Sorry.
R7- The paragraph has been redrafted in the hope of improving its understanding. We read now the following in page 4 lines 91-100: “Residents come to term of a long, demanding, and selective course of studies. The typical resident must have passed his baccalaureate among the first ranked ones, be among the "happy few" (3-5% top-ranked graduates) who enter to one of the four Tunisian medical schools. . After 7 years of medical studies, graduates wishing to specialize, have to successfully undergo a final residency contest. Success usually takes 2 to 3 attempts (Annual pass rate = 25%). Aged at least 26, the resident faces the reality of the public hospital. Residents are the only physicians present in the hospital at night, on weekends, and on holidays. They are also exposed to stress resulting from non-optimal working conditions: the need to meet professional duties set by supervisors, and the growing demand of the population.”
Q8- This is excellent, it needs to go earlier where I have asked this question (page 5, line 118).
R8- We moved the sentence as suggested.
Q9- Is this sentence repetitive? (page 5, lines 134-136)
R9- The sentence is not repetitive, but it was previously split on 2 sentences.
Q10- probable is a much better description - maybe change in the abstract?
R10- Following reviewer’s recommendation, “doubtful” has been replaced by “probable” everywhere throughout the manuscript.
Q11- Higher age and married people?? ie: what direction was the change?
R11- the paragraph has been rebuilt as to the direction of changes both for anxiety and for depression page 8, lines 206-207).
Q12- Both anxiety and depression or anxiety OR depression?? (Discussion section, page 10, line 237)
R12- This comment is in keeping with Q1, and prompted replacement of “symptoms of anxiety-depression”, by “Total HAD score” as the regression model (Poisson regression) is used when the response variables are counts (such as HAD score).
Q13- I don’t think you looked at burnout did you? (page 10, line 258)
R13- This remark is similar to Q2. The sentence and reference to burnout have been deleted for the sake of clarity and consistency.
Q14- This sentence doesn’t fit here - maybe have a limitations and future research section?
R14- This sentence has been suggested by reviewer 2 on the previous version of the manuscript. As it deals with internal validity, it seems appropriate that it appears at the second paragraph of the discussion section, page 10, lines 247-249 “The use of the French version of the HAD questionnaire should not be considered as a barrier to the residents’ completion of the survey, because that is the language of all medical studies in the country.”

Q15- Please break into two or more sentences. Which issue - just needs to be specific here (page 10, lines 268-271)
R15- Following reviewer’s suggestion, the sentence was split in 2. We also bring a precision to the fact that the comparisons concern depression in this case. We read now page 10, lines 257-259 “This proportion is lower than that recorded in our study whether we consider the rate of definite or probable depression (62%), or even when we only consider the cases qualifying for definite depression (30.5%).”
Q16- You need to define burnout - you touch on burnout a few times but your outcome measure is on anxiety and depression. How are they linked? (page 11, line 299)
R16- Burnout syndrome is indeed beyond the scope of this study, and we stress this fact in the “study strengths and limitations” on page 2. However we add a sentence in page 11, line 283 to underline the common source of burnout syndrome and anxiety/depression: “(another consequence of work-related chronic stress)”
Q17- Better word than “promulgation”?
R17 -« promulgation of a bylaw…» in page 12 lines 311-313, has been changed to “…this has been recently fixed through a law issued on March 9, 2018 whose purpose is the definition of the status of

Tunisian interns and residents”
Q18- What is the risk of alteration ... and why? (page 12, lines 320-321)
R18- We add the following explanation “…despite the fact that it carries the risk of alteration in the quality of care and education by reducing the number, and actual presence of medical residents”