Author's response to reviews

**Title:** Prevalence of Diabetes mellitus among non institutionalized elderly in Monastir city

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**Author's response to reviews:** see over
Answers to Editor in Chief

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**Title**: Prevalence of Diabetes mellitus among non institutionalized elderly in Monastir city

**Authors**: HAMMAMI Sonia, MEHRI Sounira, HAJEM Said, KOUBAA Nadia, SOUID Hala, HAMMAMI Mohamed

**Comments**: Please include an Authors’ contributions section before the Acknowledgements and Reference list.

**Answer**: Authors’ contributions sections then the Acknowledgements are included before Reference list according your recommendation.

With our considerations

The authors
Answers to Reviewer 1

Manuscript MS: 8407215896763435

Title: Prevalence of Diabetes mellitus among non institutionalized elderly in Monastir city

Authors: HAMMAMI Sonia, MEHRI Sounira, , HAJEM Said, KOUBAA Nadia, SOUID Hala, HAMMAMI Mohamed

Comment 1: The objective of this study is not met, since the findings of treatment and control of DM were not clearly presented.

Answer: There are no data of treatment, the sentence is deleted. The objective of this study was to investigate the prevalence of DM among elderly aged 65 years and older (See paragraph in page 3 in Introduction section).

Comment 2: The sampling method is not clear whether the sampling unit is household or Individual.

Answer: Method section was clarified “Sample design was a representative cross sectional community-based study, using multistage, stratified, cluster sampling. The sampling ...........the size of this population and all individuals aged more than 65 years were recruited into the sample (See new paragraph in page 4 in methods section).

Comment 3: Was the sample size in urban and rural proportional to their population size?

Answer: “...stratification was made according to the 13 delegations and urban/rural environments....) (See paragraph Study area and population in methods section)
Comment 4: This is a cross-sectional survey, what is the formula used to calculate sample size? Why the authors have to use power 95% to calculate the sample size?

Answer: This formula was used to have a representative sample of elderly population in Monastir city. According to reviewer suggestions this formula was deleted. (See page 5 in methods section)

Comment 5: There are several points with grammatical errors. For example line 14 page 2 should the word “than” be “then”.

Answer According to reviewer suggestions, grammatical errors were corrected in all the MS such as “The questionnaire was developed, translated from French into Arab then pre-tested and validated in a pilot study by…..”(See page 5 in methods section)

Comment 6: The first line of the second paragraph on page 2 is not a sentence.

Answer According to reviewer suggestions, the first line has been corrected: The questionnaire was developed, translated from French into Arab then pre-tested and validated in a pilot study by…..”(See page 5 in methods section)

Comment 7: The author said that the questionnaire was validated by the national institute of public health. It is not clear how the questionnaire was validated.

Answer The questionnaire was developed, translated from French into Arab then pre-tested and validated in a pilot study by the National Institute of Public Health (See page 5 in methods section)

Comment 8: Page 3, Line 7 of second paragraph is not clear. What were the independent variables?
The sentence was modified: Multiple logistic regression were used to examine the association between DM as a dependent variable and age, gender, hypertension, abdominal obesity, education, place of residence and co-morbidities as independent variables (a probability value of \( p < 0.05 \) was considered statistically significant). (See Page 5 in methods section)

Comment 9: It is not clear whether the definition of diabetes in this study is based on history or capillary glucose. Why random blood capillary glucose was used?

Answer DM Definition: “Diabetes Mellitus (DM) was defined as those using medication for treatment of DM during the previous two weeks and who had previously informed by a medical doctor that they had DM”. (See page 5 in methods section)

Capillary glucose (CG) was used for predicting undiagnosed DM in which DM was not diagnosed, it is demonstrated the validity of the use of capillary glycaemia in the screening phase of epidemiological studies. In view of its practical application, agility, rapidity and safety, the capillary glycaemia (CG) test is an important option for the screening of DM in detection campaigns or in population studies. (See page 5 in methods section)

Comment 10: Please explain how waist circumference was measured.

Answer The waist circumference was measured with the tape midway between the lowermost rib margin and the iliac crest. Abdominal obesity was defined by a WC greater than 102 cm for men and greater than 88 cm for women according to “WHO World Health Organization, Obesity: preventing and managing the global epidemic. Geneva WHO, 1997” (See page 5 in methods section)

Comment 11: Statistical analysis, which variables were tested using t-test or Man-Whitney test?

Answer in statistical analysis we have reported that the results are expressed for continuous variables as mean ± standard deviation (M ± SD) and for qualitative variables as frequencies. Student t test or the Mann-whitney U-test was used to estimate
differences between mean values like age “Diabetic persons are younger than non diabetic persons (71.2 ± 6.9 vs 72.6 ± 7.2 years, p=0.04). “ and the BMC and WC “The BMI and WC were significantly higher in diabetic participants than in non diabetic subjects (32.4±7 vs 29.4±6 kg/m², p<0.001; 107.7±12 vs 101±12 cm, p<0.001).” (See page 7, results section)

Comment 12: What are the definitions of these variables: physical activity (yes/no), dependency, hospital admission in preceding year, coexisting diseases and medication?

Answer: The definition of these variable are clarified: “Physical activity was defined as walking for at least 1h per day or not. The diagnosis of dependency in Activity of Daily Living was made according to Katz scale and ..........Comorbidities were defined as coexisting three or more chronic diseases.” (See 1st new paragraph in page 6)

Comment 13: Page 6, line 18, “glycemic control was higher in diabetic participants......less than 11 mmol/l”, the sentence is confusing.

Answer: The sentence has been changed in the new version: “Glycemic control was higher in diabetic participants, CG ≥ 11.1 mmol/l was present in 52% of the individuals with DM and 5.5% of non diabetic participants, p<0.0001.” (See page 7 in results section)

Comment 14: Page 6, line 22, what is the definition of “number of medication used”, what kind of medication were included?

Answer: “number of medication used.....”, this sentence was changed by the number of drugs” and well defined in method section: “Polypharmacy was defined as the use of three or more drugs recorded according to the Anatomical Therapeutic Chemical classification system [17]. We set the cut-off at three or more different drugs, because it is one of the most frequently used. Pills containing a fixed association of two active substances were counted as only one drug” (See methods section)

Comment 15: Page 7, Line 14-15, “the proportions of unawareness (5.5%).......... Please clarify how the unawareness diabetes comes, since this has not been prior defined in the method section.
**Answer:** This sentence was clarified in method section: “CG greater or equal to 11.1 mmol/L was used for predicting undiagnosed diabetes in whom diabetes was not diagnosed”

**Comment 16:** The first limitation of this study that the authors mention is very importance, how the authors addressed this limitation and it is not clear if the prevalence from this study is likely to be over or underestimated.

**Answer:** Our estimates would therefore be conservative.

**Minor Essential Revisions:**

1. **Table 1, what is the lower limit of age?**
   **Answer:** the lower limit of age was 65 years “The mean age was 72.3 ± 7.4 years (range 65-95 years). (See results & Table 1, )

2. **Table 1 and 2, what are the numbers in the parenthesis? Is all the prevalence presented in percentage?**
   **Answer:** According to reviewer suggestions, the table 1 and 2 are more clarified, all prevalence presented in percentage (See Table1 & Table 2, )

3. **Figure 1 is not informative, should be dropped.**
   **Answer:** Fig 1 was deleted

4. **Table 3, the title: “Correlates of diabetes” is not clear. The authors should present OR (95%CI) for other variables in the model. Since 95%CI of ORs were presented, beta –coefficient and p-value were not necessary.**
   **Answer:** The title of table 3 was modified according to reviewer suggestion “Table 3: Logistic Regression Models of Predictors of Awareness of DM among Adults Aged 65 and Older in Monastir City. We dropped beta coefficient and p value from table 3(See Table 3)
5. Several points in this paper need to be checked for typo errors.

According to reviewer suggestions some modifications (typing or content errors, structure) have been checked in accordance with this final version as editor/reviewer constructive criticism.

With our considerations

The authors
Answers to Reviewer 2

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Minor comments

Comment 1: Please define in the begging of the article the abbreviation of Diabetes Mellitus (DM). Write with the same form in all text because elsewhere appeared as DM, Diabetes, diabetes etc

Answer: The abbreviation of Diabetes Mellitus has been checked in the same form (DM) in all text of MS in accordance with remark of reviewer

Major comments

Comment 1: Introduction: In the first paragraph the authors have to mention also the prevalence of diabetes among other Mediterranean older populations.

Answer: A new paragraph has been added about other Mediterranean older populations: Previous surveys from Mediterranean older populations suggested that DM is present in epidemic proportions throughout the region as in Italy of 22.8% [3], in Crete of 27% [4], in Athens metropolitan region of 25.4% among males compared to 31% among females [5] and in Cyprus of 26% among males compared to 18% among females [6]. In Tunisia, despite an aging population, only a limited and fewer Tunisian
studies have focused exclusively on the elderly. Tunisia is a country in transition. (See new paragraph in Introduction section, page 3)

**Comment 2**  
Furthermore, in the phrase ‘However, the vast social and economic developments in Tunisia...’ please provide references for the unhealthier eating habits, decreased physical activity and manifestation of a wide range of noncommunicable diseases.

**Answer:** A new reference has been added (see page 3): “However, the vast social and economic developments in Tunisia since 1956 have led to cultural changes including unhealthier eating habits, decreased physical activity and manifestation of a wide range of non communicable diseases [8].”

**Comment 3**  
Moreover after first paragraph it should be more helpful for the audience a small comment of the association between diabetes and other bio-clinical and lifestyle factors. Such as cardiovascular diseases, dietary habits i.e Mediterranean diet, smoking habits, physical activity etc...

**Answer:** A new paragraph about the association between diabetes and other bio-clinical and lifestyle factors has been added:

…..” According to World Health Organization’s, DM is one of the top continuing risk factors for cardiovascular disease in the world [2]. DM is one of the major contributors of metabolic syndrome due to its pathophysiological link to other cardiovascular risks, such as hypertension, dyslipidemia, obesity, unhealthier diet, sedentary lifestyles and smoking habits [10].  
“ (see page 3, in Introduction section)

**Comment 4:**  
Methods:  
In the Subject’s evaluation please provide a reference for the definition of diabetes and for the two groups of CG. As we can see you have provide references for the definition of hypertension etc.
A new reference has been added “DM was defined as those using medication for …… medical doctor that they had DM [12].

“Participants were classified into two groups based on CG normal: …. [2, 15]. “
(see page 5, in Method section)

Comment 5  Please provide more information on how you measure smoking habits, physical activity, and activity of daily living.

Answer: A new paragraph about smoking habits, physical activity, and activity of daily living has been added ” Smokers were defined as those who were smoking ………, a score of 4 or 5 as moderate impairment and a score ≤ 3 indicates severe functional impairment [16]. (see page 6, in Method section)

Comment 6: Statistical analysis
Please define the independent variables in the logistic regression model

Answer: the independent variables in the logistic regression model were defined “…… and age, gender, hypertension, abdominal obesity, education, place of residence and comorbidity as independent variables “. (See Statistical analysis paragraph in methods section)

Comment 7  Results section

Comment 8  In both tables 1 and 2 please provide the actual number of p values and not with NS. Furthermore in tables 1 and 2 the prevalence of diabetes needed (%).

Answer: According to reviewer suggestions, the tables 1 and 2 are more clarified, all prevalence presented in percentage with p value number.

Comment 9  For the variables included in analysis (table 2) like Dependence and Hospital admission in preceding year, please provide, if possible, their measurements in methods section
Answer: The definition of these variable are clarified: “Physical activity was defined as walking for at least 1h per day or not. The diagnosis of dependency in Activity of Daily Living was made according to Katz scale and ..........Co-morbidities were defined as coexisting three or more chronic diseases.” (See 1st new paragraph in page 6, method section)

Comment 10 Table 3 needed definitions. The variable WC is not in the methods section, Please clarify this in methods section. In methods there is only a definition for abdominal obesity. Please provide also the definitions in the table 3 for the three variables WC, coexisting diseases, hypertension. For example hypertension (yes vs no), WC(...), etc

Answer: The definition of these variable are clarified in method section “WC was measured with the tape midway between the lowermost rib margin and the iliac crest Abdominal obesity was defined by a WC greater than 102 cm for men and greater than 88 cm for women [14]. “Co-morbidities were defined as coexisting three or more chronic diseases”(See Table 3)

Comment 11 Discussion
In the first paragraph the lines ‘First, our subjects are selected in older ... that diabetes prevalence increases with age.’ ‘Second, another possible reason ... particularly, obesity and sedentary life with lack of physical activity.’ needed references.

Answer: A new reference has been added “ ..........obesity and sedentary life with lack of physical activity [8].” (see page 8, in Discussion paragraph”

Comment 12 The lines ‘It is possible that the earlier onset ... prevalence of diabetes after 70 years of age in Tunisian subjects.’ needed a reference.
**Answer:** A new reference has been added “ ……. It is possible that the earlier onset of DM with a high prevalence and a high incidence of cardiovascular ….. after 70 years of age in Tunisian subjects [11,25].” *(see page 9, in Discussion paragraph)*

**Comment 13** In the lines ‘The rapid transition and changes of lifestyles involving dietary intake (high fat caloric dense food, low in complex carbohydrates, refined sugar and salt) and decreasing physical activity have take a place in the past 20 years in Tunisia’ the dietary habits and physical activity needed references. Furthermore it would be more helpful for the audience if the authors add a comment on how healthy dietary patterns may protect elders.

**Answer:** A new paragraph has been added about how healthy dietary patterns may protect elders. The urbanization had negative consequences on lifestyle aspects of Tunisians …….  Pathophysiological mechanisms include antioxidant and anti-inflammatory effects of the functional foods included in the Mediterranean diet [48]. *(see page 11, in Discussion paragraph)*

**Comment 14** After the last paragraph and the comment on hospital admissions and medication effect on diabetes, it would be more helpful for the audience if the authors add a comment from the perspective of public health. Higher public health organization and policy may prevent population from high prevalence of chronic diseases and may enhance elders’ quality of life

**Answer:** A new paragraph has been added about the perspective of public health” It is important to acknowledge ………raising diabetic’s awareness of their disease to reduce morbidity and mortality [50]. *(see page 12, in Discussion paragraph)*

**Comment 15** Limitations ‘To our knowledge, this is the first study to report the prevalence of diabetes and risk factors among adults 65 years and older.’ This is not the first study that report prevalence of diabetes in the elders…maybe the authors mean is the first in Tunisian population. Please define.
Answer: According to reviewer suggestions this sentence has been corrected “To our knowledge, this is the first study in Tunisian population to report the prevalence of DM…..” (see page 12, in Limitations section”

With our considerations

The authors