

Review of: "Statistical Overview of Prevalence of Anaemia with Associated Socioeconomic and Demographic Factors in Nigeria"

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Potential competing interests: No potential competing interests to declare.

COMMENT TO THE AUTHORS

TITLE: Statistical Overview Of Prevalence Of Anaemia With Associated Socioeconomic And Demographic Factors In Nigeria

General Comments

The study used data from the Nigeria Demographic and Health Survey (DHS) for the Malaria Indicator Survey (MIS) in 2021.

The title and authors presented at the beginning of the manuscript are well written, though the title needs to be revised to depict the manuscript's main purpose of the study as it is not **statistical overview**, rather, it is determining the prevalence of anemia and assessing associated factors, and needs to be revised.

The abstract and introduction were presented well, but they need a lot of work, as commented below under the detailed comment section. Though it is mentioned that the data was taken from the 2021 MIS/DHS, the study design used needs to be clearly stated (analytic cross-sectional study). The target population for this study is not clearly stated (women aged 15-29 years and children 6-59 months were indicated under the introduction section, but the findings were presented just for children 6-59 months old). The sample size and sampling method used also need to be described well. The analysis section was not presented as part of the methodology; rather, it was discussed under the results and discussion (Analysis, Results, and Discussion), which needs to be moved.

The detailed description of the statistical measurements used and its elaboration is not in line with the purpose of this study. Additionally, the analysis, results, and discussion were presented under one sub-section that needs to be revised, putting the analysis section under methodology. It is advised that in a scientific paper, the author can follow the Introduction, Method, Results, and Discussion (IMRAD) format. Besides the order, the contents of these sections need also to be looked at.

Specific Comments

The title better fine-tuned:

Suggested: “Prevalence of Anemia and Associated Socioeconomic and Demographic Risk Factors Among Children 6-59 Months in Nigeria” could be a possible title.”

Funding, competing interests, and authors

Unless the journal article format requires it, it is advisable to move funding and competing interests information to the end of the paper. Also, remove the authors' information under the abstract (repeated), and instead indicate the corresponding author's name.

1. Abstract-Suggested corrections

- The **study population** and the objective of this study should be clearly stipulated as the purpose is not to give a statistical overview, but to determine the prevalence of anemia and the associated risk factors.
- The **study design** that is stated separately should be part of the method.
- Because both descriptive and analytic study designs were used, it is better to state the study design as “Analytic Cross-Sectional Study.”
- How the total number of 10,714 children aged 6-59 months was selected should be described (whether it is inclusive of all or only those qualifying under certain criteria).?
- **Method:** should describe at least the target population & settings, the study design, the analysis methods used (descriptive to determine prevalence and analytic to assess association between anemia in children and SE-demographic factors). Chi-square test for bivariate analysis (Unadjusted OR) and binary logistic regression to determine the major SED predictors/factors associated with childhood anemia (Adjusted OR). The extensive description of multinomial logistic regression (2.1) is irrelevant, as there is no multinomial analysis presented under the result section in this paper.
- **Result:** The number of malaria cases tested positive (3850) indicated under the **method** section should be translated to prevalence of anemia among children with malaria (one of the objectives of the study) and moved under the **result** section. The total number of children with malaria should be indicated to extrapolate the prevalence. In writing the findings of the logistic regression analysis, it is advisable to focus on statistically significant associations (unless clinical significance is justified). For example, living in a rural area/residence does not show a statistically significant association (OR = 1.024, 95%CI 0.923-1.137).
- The logistic regression analysis output of anemia, comparing children with and without malaria, was not indicated: “Under-five children with negative malaria rapid tests are less likely to have anemia compared to those who are tested positive.”
- **Conclusion:** Should be based on the study findings. The education level of the mother was not mentioned at all in the abstract, but the focus of the conclusion was on mother's education, while being male was a significant risk factor, yet nothing was mentioned about this.

“Intervention efforts should target rural areas and mothers with lower levels of education.”

- The prevalence of anemia and the major risk factors showing statistically significant association should be summarized

under the conclusion, and relevant recommendations attached will improve the conclusion section.

◦ **2. Introduction:**

- The introduction lacks focus and flow. It discusses the magnitude/prevalence of the problem in the first paragraph, followed by potential risk factors, and returns to talking about the prevalence and again the possible risk factors in the third paragraph. In the subsequent paragraph, the epidemiology of anemia and its potential risk factors was elaborated with no or little references attached to it. The local/national situation was mentioned and followed by the findings in India, then the world, and SSA.
- **Suggested:** Follow the inverted funnel approach: provide the first global pattern, then the regional and local situations. Stay on the specific issue until exhausting the section being discussed: the magnitude and the public health importance of anemia in children, distribution, risk factors, complications, etc.
- **Literature review-** is scanty, as most of the write-ups are not supported by relevant and up-to-date references (particularly the first three paragraphs).
 - Present systematically, focusing on known social, economic, and demographic risk factors. This way, you can show the research gap (looking at known-unknown facts) that this study could address.
 - The 2021 MIS should have indicated the prevalence of malaria among the different age groups, including those 6-59 months, and it should be indicated whether the level of anemia was determined or not; if so, this study should be justified. Why the need to determine again the prevalence of anemia?
 - The justification at the last paragraph of the introduction is not strong enough.

“Since there is a dearth of data on anaemia in populations other than children and pregnant women in Nigeria, the study will ascertain the prevalence of anaemia in these populations.”

In general, the flow of the introduction section needs a lot of work; the write-up structure, rephrasing, editing, and including relevant literatures is required.

3. Research and Methods:

- This section is better if rephrased as “Research Method.”
- **Study Design:** This is an analytic cross-sectional study/CSS design, not “cross-sectional data set.”
- **Variables:** Dependent and independent variables need to be clearly stated (Anemia: having/not having as dichotomous outcome/dependent variable and SE-Demographic factors (specify e.g., age, sex, mother’s educational status, wealth index, residency, mosquito net use, etc.) as independent/potential predictors variables).
 - Note “the prevalence of anemia,” but “Anemia” is the outcome variable of interest:“
The dependent variable in this study refers to the prevalence of anaemia with associate socioeconomic and demographic factors in Nigeria.”
- **Logistic regression and Chi-square:** The extensive write-up of this section is not relevant to the purpose of the study and is better if it is brief and explains the types of analysis to be used to determine the prevalence of anemia

(descriptive statistics) and factors associated with anemia (bivariate/Chi-square and logistic regression analysis), based on your study objectives (research questions and/or specific hypotheses) as indicated earlier.

- **Data Analysis, Results, and Discussion sections**

- Refer to the comment above: move analysis under the method section.
- Separate result and discussion sections. This way, you can easily discuss your findings stated in the results by including relevant references from your literature reviews.
- Also, a lot of rephrasing and editing is required.

3.1 Descriptive Analysis of Data

- You better refer to this as “**3.1 Socio-Economic and Demographic Characteristics.**”
- Similarly, change the title to **Table 1. “The Socio-Economic and Demographic Characteristics of Children 6-59 months old; Nigeria, 2021.”**
- Only give a brief description of any striking findings (highest or lowest figures) on the table.

3.2 Association between Anaemia in Children Under-5 years of age in Nigeria and Socio-Economic and Demographic factors using Chi Square Analysis

- **Suggested:**
 - 3.2 “Factors Associated with Anemia”, and
 - Table 3.2. “**Bivariate Analysis of Factors Associated with Anemia among Children 6-59 months, Nigeria, 2021.**”
- The **variables** included in the logistic regression analysis should also be presented under bivariate analysis results first, which is not the case (e.g., child’s age and use of mosquito).
- Suggested: “On the bivariate analysis, malaria, sex, wealth index, mother’s education level, use of mosquito net, and place of residence showed statistically significant association with having anemia among children 6-59 months. But, only sex, wealth index, educational level of mothers, child’s age, and malaria status were statistically significantly associated with having anemia among children 6-59 months. While residence and use of mosquito did not show a statistically significant association.
- Regional differences, though seeming statistically significant, should not be taken seriously as our sampling technique does not allow for seeing comparability (cross-sectional study in contrast to cohort or case-control study).
- **4. Discussion:** There is no discussion section at all. Whatever is presented under “Data Analysis, Result and Discussion section” is just results.
- **5. Conclusion:**

Conclusions should be based on the study findings and should not repeat the results or discussions, just summarize and recommend. Only the last section of the last paragraph has a sense of conclusion but needs rephrasing and revising.

“Hence, the results suggest that intervention efforts should target rural areas and mothers with lower levels of education and wealth to reduce the incidence of anaemia.”

Suggested: Children being male, younger, and having malaria from poor and less educated mothers/families are at greater risk for anemia. Therefore, public health interventions targeted towards young children with malaria who have mothers with a low level of education and are poor are highly recommended.

6. Tables and figures:

There are tables but no figures that could better present the descriptive analysis findings. All the tables need proper formatting and editing.

7. References

- Inadequate/scanty references and most write-ups not supported by relevant references
- Need to be up-to-date
- Literature review should be in line with the objectives of the study and be well structured
- Styles and formats should be consistent.

General assessment: Generally, this paper addresses a critical public health problem, which could provide evidence for action-guiding policies and programs if it clarifies its target population, clearly portrays the research gaps, and defines the study objectives and methodologies used. Sub-sections should be properly defined and specified. The null and alternative hypotheses stated should be **specific** and align with the **objectives** of the study, relevant to the problems to be addressed as part of the analysis section under the methodology. The discussion section is basically missing, making the whole manuscript incomplete; and it is also advisable to include more relevant and up-to-date literature under the introduction and discussion sections.

There are a lot of redundancies, though important information, particularly under the introduction, research, and methods (better “research method”), in addressing the purpose of the study. The authors, being from the statistics profession, may have been biased to delve into statistics and tried to share a lot of basic information on statistical measurements that took a lot of space in the paper. Hoping the authors take note of this, and if most of the comments are addressed and effort is made to improve the paper, adding a thorough discussion section and appropriate conclusion based on the study findings, the paper has the potential to be published, but not at all in its current status.

Thank you.

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