Peer Review File

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Reviewer A

This article provides insight for readers and health policy-makers in evaluating Malnutrition research output using the 100 top-cited articles extracted from WOS since 1940. There are several issues that should be clarified for readers and improvements should be made in the next run of review.

General Comment: Thank you; please see below our point-by-point response to the concern raised.

Major concerns:
Comment 1: There are too many Tables and Figures (n=16) to make clear about the article aims and motivations. Usually, the number of tables and figures is limited to five or less. Otherwise,. The purpose of providing insight for readers is in vain.

Reply 1: Thank you for the suggestion. Accordingly, we have provided a few tables and figures that the coauthors consider essential throughout the manuscript.

Changes in the text: Table 1 – 5 have been included intext, and the same applies to Figure 1-3.

Comment 2: The purpose of this study is too vague about evaluating the 100 top-cited scientific researches on global malnutrition. Author should highlight the hypotheses made in introduction and verify them in Results. For instance, from literature, the US dominate the field of malnutrition and the journal impact is associated to the number of citation. Authors should verify them in the articles. Otherwise, this article only expresses that authors own the techniques of bibliometric analysis instead of the skill of theme verification.

Reply 2: Concern acknowledged as it points to an essential rationale of this study. The study aims to use bibliometric indicators to evaluate the top-cited articles author's contributions, countries or research origin, institutions, research area categories, and hot topics. Therefore, we have added the missing Table S1, "Supplementary Table S1.Top 100 cited paper in malnutrition," which offers the core of the paper's aims. We have also included extensive research objectives in the last paragraph of the introduction of the revised manuscript. (See page 3 lines 64- 79)

Changes in the text: This exposition is one approach that may foster the understanding of malnutrition intervention and possibly inform future policy frameworks. Bibliometrics analytical technique applies the quantitative investigation of indicators such as publication count, citations, impact factor, and co-citations to understand the different aspects of research output(18,19). The bibliometric analytical technique has consistently supported researchers in numerous research fields, including clinicians, governments, and general practitioners, in facilitating the monitoring of improvements and developing public health policies(20). Nevertheless, a search in the Web of Sciences databases revealed a dearth of scientific evidence on the bibliometric analysis on malnutrition that can support the global mediation of the disease. Therefore, this paper aims to evaluate the 100 top-cited scientific research on global malnutrition by presenting, baseline line date of top articles, hot topics in the top-cited articles, authorship and their affiliation, and the corresponding authors' country of origin. In scope, the study objective is to access the top-100 articles on malnutrition to accentuate top research trends on malnutrition, centering on the total of publications spanning over a century, researchers, countries, institutions, and collaborations. The other objective is to analyze the most productive country and institution, research categories, frequency analysis, top 100 authors keywords, and factors affecting the number of citations of tp-100 malnutrition research.

Comment 3: The methods used in Results should be explained in Methods, such as the h-index and g-index that should be referred to and formulated in Methods.

Reply 3: Thank you for the constructive suggestion. Indeed, all methods used in results must be included in the methods. Here we updated the methods to reflect all procedures in the study and the inclusion of h_index and g_index used, among others. (see page 4 lines 82 – 125)

Changes in the text:

Methods

Search Strategy

To identify the top 100 cited documents malnutrition-related literature, we performed our search through the Web of Sciences Database WoS (https://apps.webofknowledge.com/) database (updated on 20 February 19, 2021) by two researchers to avoid the database's daily update. First, a comprehensive search was conducted to identify the main heading Terms and relevant Entry Term (s) indexed Medical Subject Headings (MeSH), which is available on (https://meshb-prev.nlm.nih.gov/search). Then, a Boolean search was conducted using the terms in the title ("malnutrition*" OR "Undernutrition" OR "Nutrition Deficiency" OR "Nutrition disorders" OR "malnourishment") with the largest time Timespan allowed through the WoS ("all years [1900-2020]") with aiming to cover all the potential articles(15). Documents Indexes: ("Science Citation Index Expanded") and ("Social Sciences Citation Index"). Regardless of document type and language: Only English published documents were included. We limited our results to full research articles and reviews sorted by the number of citations. Other document types were excluded from the analysis. As a result of a comprehensive search, a total of 10100 documents related to malnutrition were the subject of further analysis(15). For further analysis, a list of top-100 articles was created by sorting all the retrieved items according to the citations score.

In addition to identifying the top 100 most cited document on malnutrition-related literature based on the citation, two independent reviewers (THM and AYA) evaluated the yielded title to compile a list of the top 100 most-cited articles of malnutrition and ensure that only relevant auricles were included. Finally, the top 100 selected articles were downloaded in Plain text format and tab-delimited (win) format for further analysis. There is no ethical approval required and bibliometric analysis and the data were downloaded from the public databases.

Bibliometric indicators and mapping

While assessing the articles and journals, the following information was extracted from the 100 articles: (1) title of publications; (2) year of publication; (3) Number of total citations received from each publication; (4) authorship details; (5) document type; (6) institution;(7) Journals title; (8) document type;(9) country of an article based on Single country publications (SCP) and Multiple country publications (MCP); (10) Journal impact factors was obtained from Journal Citation Reports (JCR) © Ranking: 2019; (11). Furthermore, authors or Journal h-index and g_index level metric was calculated to measure both the productivity and citation impact of the publications of a scientist or scholar (16)(17)(18)(19–21); (12)(22) In addition to the Keyword analysis which includes the frequency distribution of the authors' keywords' (Keywords (DE)), and the frequency distribution of keywords associated to the document by Clarivate Analytics Web of Science ((Keywords Plus (ID))(18). On the other hand, the scientific collaboration on the social process by which two or more researchers on malnutrition

are working together as collaborators sharing their intellectual and material resources to produce new scientific knowledge in research related to global malnutrition(23).

Data analysis

Network analysis collaboration networks amongst authors, countries, and keywords were created using VOSviewer software (24). Bibliometrix (an R package)(18), GraphPad Prism 5 (25) were used for frequency analysis and data visualization. Given the distribution of variables and the presence of outliers, we preferred to use the median, range, and interquartile range (IQR) to describe some variables since these measures are less affected by extreme values(26)(17). Pearson correlation coefficient was calculated using the Spearman correlation coefficient (r) to examine the association between citation times and the study variables. A P-value of less than 0.05 was considered statistically significant.

Comment 4: The tables and figures should be put behind the context. Obviously, there are not consistent with each other in the context.

Reply 4: Thank you for pointing this out. We have fixed tables and figures behind the contexts in our revised version as well as you suggested.

Comment 5: In Discussions, authors should talk about what knowledge added to the previous studies and what are consistent to the previous studies. The implications and limitations should be addressed clearly and comprehensively for readers.

Reply 5: The authors have extended the discussion to execute this insightful suggestion. See page 11 lines 276-293

Changes in the text:

Numerous studies have explored global malnutrition, and there is evidence of the adverse effect of special groups such as the aging population, children, kidney patients, and hospital patients. For instance, the previous bibliometric that explored the global found that the top themed malnutrition publication was child malnutrition, and there is an interconnection between maternal care and child malnutrition and those with chronic kidney diseases and the aging population. (16,37,38). Relative to other studies, keywords such as nutritional status, mortality, developing countries, blood pressure, cardiovascular disease, and growth were the most recurring terms in the current bibliometrics on top-100 cited articles on malnutrition. The evidence in this study shows that malnutrition has no limitation in its occurrence as it can affect children (39) as stunting and malnourishment intensifying morbidity.

Similarly, with blood in the authors keyword analysis, it further advances that there is interconnetion between malnutrition and blood pressure, especially in older adults(40). Other similarly bibliometrics have found that malnutrition research is the most prominent occurring theme in researches focusing on anemia in children (41),

cardiovascular diseases(42), and the peculiarity of child malnutrition gain substantial attention in academia and social media(43). Thus the evidence and the magnitude of malnutrition globally calls for comprehensive policy and research intervention that will support the eradication globally. These interventions may include intensifying efforts to increase global food supply and supplement intake among those vulnerable. Research funding and action must be strengthened to highlight risk factors and the geographical dimension of malnutrition occurrence.

Minor concerns:

1. In Abstract, the expression of "a median of 342.5. (195.5)" is vague when referred to the content in Results: the median 342.5, range from 235-2890, and IQR (195.5). Please describe it in Abstract in details about the 195.5

Reply 1: Thank you. We have provided details in the Abstract.

Changes in the text:
Result: The top 100 Malnutrition articles were published between 1940 and 2019. The number of citations ranges from 235-2890 times, with a median of 342.5, and the interquartile (IQR) range was 195.5……..

Comment 2: No verb in the sentence in Results: The Average citations in a single year per document (27.55).

Reply 2: Thanks for the comments. We have refined the sentence. See Page 5 (Line 129-132).

Changes in the text:
The average number of citations in a single year per document was (27.55). The top 100 cited articles include 78 research articles and 22 review papers.

Comment 3: Where to get or download the file of Supplementary Table S1 mentioned in Results?

Reply 3: Thank you for the keen observation. We apologize for not including the supplementary Table S1 in our submission. We have attached it in the revised version of the manuscript as Supplementary Table S1.

Comment 4: In Table 1, the indicators should be defined in Methods, such as Keywords Plus (ID), Author's Keywords (DE), Collaboration Index, difference between Authors and Author Appearances which are unknown for readers who would link to replicate the study in the future.

Reply 4: Thanks for the comments. We have provided a clear explanation of the

Collaboration Index and authors' keywords. Where Collaboration Index (CI) is used to determine scientific impact using bibliometrics analysis the methods. See page 5 lines 111-116

Change in the text:
"In addition to the Keyword analysis which includes the frequency distribution of the authors' keywords' (Keywords (DE)), and the frequency distribution of keywords associated to the document by Clarivate Analytics Web of Science ((Keywords Plus (ID))(18). On the other hand, the scientific collaboration is the social process by which two or more researchers on malnutrition are working together as collaborators sharing their intellectual and material resources to produce new scientific knowledge in research related to global malnutrition(23).

Other information added in the tables have been explained, such as
First Authors: First author of each document
Appearances: Number of author appearances
DE: Frequency distribution of the authors' keywords."
ID: Frequency distribution of keywords associated with the document by Clarivate Analytics Web of Science
CI: Collaboration Index

Comment 5: In Figure 1, We would like to know the titles in vertical axes and what is the citation score defined in the study.

Reply 5: We thank the reviewer for this comment. We have modified the figure with clarity.

Changes in the text:
Total Citation Score: The number of times each document has been cited

MeSH terms, Medical Subject Headings (MeSH), which is available on

Reply: We thank the reviewer for this comment. A comprehensive search was conducted to identify the main heading Terms and relevant Entry Term (s) indexed Medical Subject Headings (MeSH), which is available on (https://meshb-prev.nlm.nih.gov/search).

Comment 6: 98 (https://meshb.nlm.nih.gov/search), are used in PubMed. What is the relation to the WOS in the study should be explained for readers.

Reply 6: We thank the reviewer for this technical comment. We used Medical Subject Headings (MeSH) to search or identify the main heading Terms and relevant Entry Term(s) that will helps in including all indexed keywords in medical databases. These

procedures are replicable when searching in the Web of Science to ensure that all keywords associated with the study theme are searched comprehensively.

Comment 7: Figure 1 should be put beneath the subtitle of Annual trend and total citations

Reply 7: Thank you. We have fixed this as appropriate.

8 Line 150: across to mainly two thematic areas should be reviesed based on the English grammar.

Reply: We have removed this part base on the journal guideline.

Comment 8: It is hard to read Figure 2 matched to the context in manuscript that should be clear and easy to read the Figure 2. That is, what are the horizontal and vertical axes and the color meaning?

Reply 8: Thank you. This particular Figure 2 has been removed to reduce the number of the figures based on the journal guideline. A new figure has been labeled figure 2

Comment 9: Line 192: The most contributing authors with (h-index≥3) were identified. Table 2 shows the top 17 authors that should be Table 3???

Reply 9: We have corrected the table in our revised version.

Changes in the text:

Authorship and Affiliations Analysis

The most contributing authors with (h-index≥3) were identified. **Supplementary Table S2** shows the top 17 authors ranked by h-index and author ranking (1st author, 2nd Author, and 3rd Author).

Comment 10: What is the meaning by Collaborations in Table 4.

Reply 10: Thank you. The term Collaboration Index (CI) is the scientific collaboration by two or more researchers on research such as malnutrition

Comment 11: In Table 4, the NP is defined by the first author or others that should let readers know.

Reply 11: The 'NP' is defined by the first author, and this has been included in the revised manuscript

Comment 12: Why g-index in Table 5 is used instead of h-index as in other Tables. Authors should explain it in Methods.

Reply 12: Thank you for pointing this out. We have corrected this in the revised manuscript only to reflect the number of publications (NP) of first-author institutions.

Comment13: Line 217. Close to half of the articles were categorized…. Should be replaced with almost half of …..

Reply 13: We have revised this in our corrected version. See page 7 lines 168-174

Change in the text:
In Table 4, the World Health Organization (WHO) was the leading organization in malnutrition research, followed by Johns Hopkins University and the University of Sao Paulo. According to the categories of the top 100 most-cited articles on malnutrition, almost half of articles were published in General and Internal Medicine (n=24) and Nutrition & Dietetics (n=24). Other common categories include Pediatrics (n=8), Public, Environmental & Occupational Health (n=7), Urology & Nephrology (n=6) among others.

Comment 14: Line 226: Figure 6. Co-authorship analysis between authors with a minimum of 1 document 29 documents met this threshold. What is the meaning of a minimum of 1 document 29 documents met this threshold???

Reply 14: We thank the reviewer for pointing out the mix-up in presenting Figure 6. We have corrected the statements as "A minimum number of 1 instance of authorship was required to meet the search criteria, and 29 authors only meet the thresholds".

Change in the text:

Comment 15: Similar to Figure 6 mentioned above, Figure 7 with a minimum of 2 236 documents 25 documents met this threshold.

Reply 15: We thank the reviewer again for pointing out the confusing presentation of our data in Figure 7. We have corrected the statements as "Among the reported countries, a minimum number of 2 instances of the country was required to meet the search criteria, and 25 countries only were met the thresholds."

Reviewer B

This manuscript studied the top 100 highly cited papers on global malnutrition research

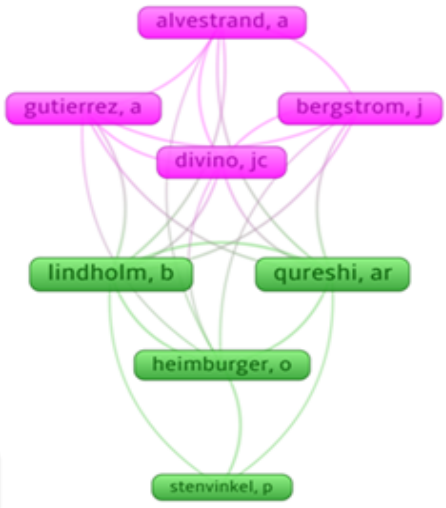
using bibliometrics analysis. Adequate nutrition supply is very important to our health. Malnutrition in the form of lack or excess of any one of the essential nutrients will weaken our immunity and lead to disorder or illness [1]. So the investigation presented in this manuscript is very interesting, and should be published if the authors can make the following major revisions:

Reply:
We want to thank the reviewer for the thorough perusal of our manuscript and insightful input to improve the quality.

Comment 1: The co-authorship mapping in Figure 6 is not representative. There are more than 500 authors involved in the top 100 highly cited papers. Please see the attached png file (as seen below) for the mapping of these 500 plus authors. The 29 authors mapped in Figure 6 are only the authors of the largest set of connected authors. Yet, as a mapping consisting of 500 plus authors will be very messy, the revised mapping may only choose the authors with minimum 2 documents.

Reply 1: Thank you for pointing out the oversight in the presentation of our data in Figure 6. We have corrected the statements as "A minimum number of 2 instances of authorship were required to meet the search criteria, and 40 authors only meet the thresholds". Please see page 8 lines 219

Changes in the text:
For each of the 40 authors, the total strength of the co-authorship links with others were calculated and authors with the greatest total length strength was selected and presented in 2 cluster.



VOSviewer

Figure (A) **Figure (B)**

Figure 2. Co-authorship analysis of authors (A), and countries (B) based on the total length strength (TLS).

Network analysis for Co-authorship and countries

The network analysis between co-authorship and countries visualize and show the network's analysis based on the total length strength (TLS) was conducted using VOSviewer software. Among the reported countries, a minimum of 2 instances of the country was required to meet the search criteria, and 25 countries only met the thresholds". In cluster 3, the US (TLS75), followed by Switzerland (TLS=27), France (TLS=17), Pakistan (TLS=11), and Spain (TLS=3). In cluster 1; Netherlands (TLS=42), Germany (TLS=36), Sweden (TLS=29), and Thailand (TLS=16), and in cluster 3; India (TLS=24), and Colombia (TLS=3) as presented in Figure 2 (A). For Co-authorship analysis, with a minimum of 2 instances of authorship required to meet the search criteria, and 40 authors only met the thresholds". For each of the 40 authors, the co-authorship links' total strength was calculated, and authors with the greatest total link strength were selected and presented in 2 clusters. The first cluster includes; A lvestrand A, Bergstrom J, Divio JC, Gutierrez A with each (TLS=11), and the second cluster includes; Lindholm B (TLS=14), Qureshi AR (TLS=14), Heimburger O (TLS=10), and Stenvinkel P (TLS=4) as shown in Figure 2 (B).

The discussion on malnutrition should be more specific. Different forms of malnutrition like nutrient deficiency (Maternal and child undernutrition), nutrient excess (obesity and metabolic syndromes) or illness induced malnutrition (like protein calorie malnutrition in chronic renal failure) have different causes and their effects on health and disease outcome are also quite different.

For example, the protein calories malnutrition in chronic renal failure is caused by illness-induced anorexia (IIA), which is an adaptive, protective response for injury elimination [2]. Nutrient intake will not reverse this process, and it will only stop when the insult, like the infection or injury has been resolved (https://www.medscape.org/viewarticle/432384_2). During sickness, IIA systematically upregulates autophagy to degrade the injured cells and tissues, and reuse the degraded macromolecules and organelles as nutrition source to reinstall body homeostasis and health [3]. That's why aggressive nutritional support does not benefit patients but may be detrimental [4]. In the 16th Century, Luigi Cornaro had already noticed the health benefit of IIA, as he wrote: "since, by using very little when sick, they recover their health – and we know how sparing the diet by the use of which invalids are restored is." (Luigi Cornaro, The Art of Living Long, page 83. Milwaukee. Butler WF. 1905, http://hdl.handle.net/2027/nnc2.ark:/13960/t1sf3j34q).

Reply: Thank you for this constructive feedback. We have discussed in specifics some

of the prevalence of malnutrition. See page 2 Lines 38-47

Changes in the text:

In specifics, malnutrition occurs as maternal and child undernutrition(5), imbalance malnutrition evidence in obesity and metabolism syndromes (6,7). In other dimensions, illness may also induce malnutrition, especially among kidney patients (8), among different prevalence that subsequently causes adverse health outcomes. Literature has expanded on protein-calorie malnutrition in chronic renal failure caused by illness-induced anorexia (IIA), an adaptive, protective response for injury elimination(9). Concurrently, nutrition and the immune system are vital components that mediate each other so much that when there is malnutrition, the immune response in the human body is grossly affected(10). Malnutrition also prevails as a comorbidity in persons with liver diseases(11) and a risk factor for small cerebral vessel disease cognitive decline in peritoneal dialysis patients(12).

The following typos in the manuscript should be corrected:

Comment 1: Page 16, line 226, "with a minimum of 1 documents 29 documents met" should be "with a minimum of 1 document, 29 authors met";

Reply 1: We thank the reviewer for this comment. The mix up is corrected in our revised version.

Comment 2: Page 17, line 236, "with a minimum of 2 documents 25 documents met" should be "with a minimum of 2 documents, 25 countries met";

Reply 2: We thank the reviewer for this comment. The mix up is corrected in our revised version.

Comment 3: Page 19, line 261, "and number of Number of authors" should be "and Number of authors";

Reply 3: We thank the reviewer for this comment. The mix up is corrected in our revised version.

Comment 4: Page 21, line 325, "among the major countries contributing countries" should be "among the major contributing countries"

Reply 4: We thank the reviewer for this comment. The mix up is corrected in our revised version.

The authors may include the following references in the revised manuscript for a better understanding of illness-induced malnutrition:

1. Barrea L, Muscogiuri G, Frias-Toral E et al (2020) Nutrition and immune system:

from the Mediterranean diet to dietary supplementary through the microbiota. Crit Rev Food SciNutr. https://doi.org/10.1080/10408398.2020.1792826
2. van Niekerk G, Isaacs AW, Nell T, Engelbrecht AM. Sickness-Associated Anorexia: Mother Nature's Idea of Immunonutrition? Mediators Inflamm. 2016;2016:8071539. https://doi.org/10.1155/2016/8071539.
3. van Niekerk G, Loos B, Nell T, Engelbrecht AM (2016) Autophagy—a free meal in sickness-associated anorexia. Autophagy 12:727–734. https://doi.org/10.1080/15548627.2016.1147672
4. Arabi YM, Reintam BA, Preiser JC (2019) Less is more in nutrition: critically ill patients are starving but not hungry. Intensive Care Med 45:1629–1631. https://doi.org/10.1007/s00134-019-05765-0

Reply: We thank the reviewer for this comment. Two of the references provided were cited in our revised manuscript.