Acta Médica Portuguesa
Editor in Chief
Tiago Villanueva

Porto, 30th May

Dear Dr. Tiago Villanueva,

Thank you very much for giving us the opportunity to revise our manuscript. We have revised the manuscript according to the valuable comments by the reviewers.

Below please find our response to the comments of the reviewers point-by-point, in which we also discuss the revisions made in the manuscript according to the reviewers' suggestions. The changes in the manuscript are recognizable by track changes in the manuscript.

We believe the manuscript has benefited from the reviewers' comments. We hope that we have revised the manuscript to your and the reviewers' satisfaction, so that it will be accepted for publication in Acta Médica Portuguesa.

Yours sincerely, also on behalf of the co-authors,

Ricardo Marinho
ricardocsmarinho@gmail.com
Rua Godinho de Faria, nº 553 2º esq tras.
4465-155 São Mamede Infesta
Porto, Portugal

Comments from the Editor and reviewers:

Editor:

Com o objectivo de optimizar a legibilidade do seu artigo e assim incrementar potencialmente as citações do mesmo, recomendamos que os conteúdos redigidos em inglês sejam revistos por um "native speaker", tradutor qualificado ou empresa especializada em serviços de "language polishing";

- *Authors' response:* We thank the Editor for this suggestion. The manuscript has been revised by an English language expert.

O resumo e o abstract não deverão incluir abreviaturas;

- *Authors' response:* We agree with the Editor. However, we only use conventional abbreviations (such as odds ratio – OR) that if eliminated we feel would make the abstract difficult to read.

No idioma português, as unidades devem ser separadas das casas decimais por vírgulas e não por pontos - estes serão exclusivamente usados nos conteúdos redigidos em inglês;

- *Authors' response:* We agree and thank the Editor for pointing that. We made the necessary corrections.

No corpo do manuscrito as referências deverão ser assinaladas em sobrescrito (expoente), a seguir a vírgulas (,) e pontos finais (.), ou antes de ponto e vírgula (;) e dois pontos (:);

- *Authors' response:* We thank the Editor for pointing that. We made the necessary corrections.

As abreviaturas deverão ser enunciadas por extenso na primeira vez que sejam referidas no corpo do manuscrito [ex: advanced maternal age (AMA,)] e não em nota de rodapé, no abstract/resumo, ou em listagem de abreviaturas;

- *Authors' response:* We thank the Editor for pointing this out. Abbreviations were defined the first time they were mentioned in the manuscript. We deleted the abbreviation list.

Os profissionais identificados na secção "Agradecimentos/Acknowledgements" contribuíram de alguma forma para o estudo, mas não tiveram peso de autoria, tendo que ser apresentada autorização escrita para que se possa publicar os seus nomes;

- *Authors' response:* We included the names of the colleagues that contributed for the data collection, and added their written authorization.

Na listagem final de referências, as revistas consultadas deverão ser identificadas na sua forma abreviada (ex: Acta Med Port e não Acta Médica Portuguesa).

- *Authors' response:* We thank the Editor for pointing this out. The reference list has been updated according to formatting requirements.

Reviewer: A

Structure of the manuscript:

Title- The title is instructive although it is not very short and summarizes well the manuscript.

Abstract-The abstract is well structured and efficiently summarizes the content.

Introduction: The objectives of the study are clearly described in the introduction, as well as the relevance of the study.

Methods-It describes how objectives were reached, being the study design and methodology appropriated to its objectives. I did not find methodological failures. The statistic method is accurate and the methodology in epidemiological based manuscripts is adequate. The number of patients included in the study is large and the duration of the study is long enough. It would be interesting to refer the methods used by physicians to evaluate nutritional status: just body index? Braquial perimeter? others?

- *Authors' response:* In our study, we aimed to evaluate nutritional risk. Therefore, physicians were not instructed to use any specific criteria when subjectively stating if they though the patient was nutritionally at risk.

Results-The data presentation and analysis are accurate, the results are clear and convincing and the tables and charts are legible and correctly design. In table 1 line 25 I suggest «Infectious and parasitic diseases » instead of «certain infectious and parasitic diseases».

- *Authors' response:* We agree with the reviewer that the used phrase may sound a bit strange. However, we used ICD 10 to classify the diseases and health problems identified in the study patients, and according to ICD 10, the nomenclature used is "certain infectious and parasitic diseases", because this section does not include all types of infectious and parasitic diseases.

Discussion-In the discussion, the relevance of the results is explained (a higher prevalence of malnutrition risk compared to other Portuguese studies is due to the fact of the population studied is one consisting of patients in internal medicine wards, which are older and with more comorbilities that impact on nutritional status. Planned admissions seem to decrease the odds of malnutrition risk (which seems to reflect a less severe health state than the one the patients admitted to the emergency department). A moderate agreement between the physicians impression of malnutrition risk and risk assessment made by using NRS 2002 was found explained by the lack of nutritional awareness among physicians in Portugal and other countries because education in clinical nutrition in medical curricula is poor. In a setting of high prevalence of malnutrition were physician assessment does not adequately identify at-risk patients, the authors defend that these results call for an urgent implementation of mandatory nutritional screening across hospitals. Identifying high risk patients may improve hospital reimbursement. It describes areas in need for further studies, like investigating the cost associated with coding malnutrition, as this could be an incentive to screen, evaluate and treat malnourished patients. It is stated the major strength of the study, being the large number of participants and the huge distribution of participating hospitals across the country. Limitations are described the estimation of height and weight, which can lead to under or overestimation of those values.

Conclusions: The conclusions are relevant, based on the results and resulted from the objectives (Prevalence of malnutrition is high in Internal Medicine wards because of being older patients with multiple comorbidities which put them in malnutrition risk and affects their prognosis. As he physicians judgement identifies less patients at malnutrition risk, a nationwide nutritional screening policy is needed.)

References: The reviewed literature is adequate and follows the AMP style. The citations contain the information described in the manuscript. No recent or relevant article was omitted and the percentage of recent references is adequate.

Tables and Figures: The message is clear enough, so that no reference in the main text is needed. The tables and charts are clearly identified and legible. All the abbreviations and acronyms are described in the footnotes.

Acknowledgements: A financial support is declared. No conflicts of interest are declared.
It is referred that all authors have participated in writing the manuscript in similar way.

EXTENSION: The manuscript cannot be shortened without removing crucial aspects as well as tables and charts. One of the tables can be improved (table 1)

- *Authors' response:* We thank the reviewer for this suggestion. The abbreviation "AIDS" was removed as it wasn't mentioned in the table.

PRESENTATION: The manuscript is clearly and logically presented

Reviewer: B

Os autores abordam um tema um pouco "esquecido" dentro da própria medicina sendo um grande ponto a favor do trabalho. A integração de vários centros traz dificuldades acrescidas que penso que foram ultrapassadas neste trabalho. Em relação ao trabalho em si, a salientar a necessidade de uniformização do texto, sobretudo em relação ao Charlson.

- *Authors' response:* We thank the reviewer for the valuable suggestions. We uniformized the text regarding the "Charlson" designation.

Os dados estatísticos apresentados são claros e ao longo da discussão são feitos os reparos necessários aos mesmos.

A conclusão necessita de ser revista pois é demasiado genérica para todo o trabalho realizado pelos autores.

- *Authors' response:* We thank the reviewer for pointing this. The conclusion was revised according to all the reviewers' suggestions.

Reviewer: C

Relevance: The manuscript is original since it shows relatively recent data for undernutrition in Portuguese internal medicine hospitalized patients. It is relevant for clinical practice because it draws attention to a problem with a strong clinical impact - the undernutrition. Results are relevant but some issues deserve attention.

Concerning the structure of the Manuscript:
Title: it is informative. However, two terms are incorrectly used. The first, "prevalence", is used for data from a non-probabilistic sample. There is no information in the Methods section about the population at risk in each ward and about the sampling methods used. As prevalence is defined as "the total number of individuals who have the condition at a particular time divided by the population at

risk of having the condition at that time or midway through the period" (Porta M, 2014), prevalence only can be computed when the entire population at risk or a representative sample is assessed. The authors should correct this.

- *Authors' response:* We understand the reviewer's reasoning. However, as it would not be feasible to study an entire population, samples are usually used for this purpose. This is the method used in many studies (such as Klek, S 2013; Sauer AC 2019; Rasmussen HH, 2004).

Secondly, this manuscript focuses on undernutrition and not about malnutrition, which refers to not only deficiencies, but also to excesses, or imbalances in a person's intake of energy and/or nutrients. Because this article focuses on undernutrition risk, authors should adapt the text, to precise the scope of this research.

- *Authors' response:* According *to* Cederholm et al. ESPEN guidelines on definitions and terminology of clinical nutrition (2017), ESPEN has chosen malnutrition as the primary term for this nutrition-related disorder. Undernurition can be used as a synonym for malnutrition, but it is not recommended as first choice. Also, the NRS 2002, the tool used in the paper, defines malnutrition risk. We added the definition of malnutrition in the Introduction in order to clarify this matter.

Abstract: reflects the content of the manuscript and it is well structured. The aim is "to identify the determinants of undernutrition". Concerning the cross-sectional design use, only factors associated with undernutrition can be identified. Determinants are only identified in longitudinal analyses. This is much better written in the introduction.

- *Authors' response:* We agree with the reviewer that "determinants" may give a wrong impression of a cause-effect relationship, and so we changed this term to "corelates".

In the Materials and Methods section, it is mentioned that: "Data on demographics, previous hospital admissions, primary diagnosis, Charlson comorbidity index, and education level were collected. The education level is "demographics".

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary correction.

Results: "demência (OR=3.02, 95% CI: .96-4.64)": "demência" should be corrected to "dementia" and a number is missing in the confidence interval: " .96-4.64".

- *Authors' response:* We thank the reviewer for pointing this out. The number has been corrected. We also confirm that we used "dementia" in the English language rather than Portuguese.

The conclusion "poor physician assessment" should mention that this assessment of nutritional risk was subjective.

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

And also the sentence "The high prevalence of at-risk patients and poor physician assessment call for the need for mandatory nutritional screening" should be actualized because as authors refer to in the Discussion section, since 2018, the nutritional screening is already mandatory in Portugal.

- *Authors' response:* We thank the reviewer for this suggestion. Data collection for our study occurred during 2017, when nutritional screening was not yet mandatory. In fact, preliminary data

from this study was used to justify mandatory implementation of nutritional screening. However, although now nutritional screening is mandatory, it is not yet fully in practice across the country. Therefore, our study calls for the need for the implementation of this screening. The conclusion's wording was edited for clarity on this subject.

Introduction: the objectives are clearly mentioned and the relevance of the study is justified. The sentence "but nationwide over 20% of the hospital beds are provided by Internal Medicine wards (8)" should be reformulated because the reader could understand that "nationwide" refer to Portugal and this study (your reference 8) was carried out in Canada.

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

Moreover, "over 20%" is vague, could any number above 20%. Of my reading of the article, I am sure that authors should refer to "all hospital bed-days" and not "hospital beds".

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

The sentence "making patient nutritional assessment rely on the judgment of the attending physician" should be corrected to "nutritional screening".

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

Methods: are clearly described but as I mentioned in the abstract, information regarding sampling procedures is missing. How was the sample size in each hospital calculated?

- *Authors' response:* We thank the reviewer for pointing this. However, we performed convenience sampling, as our objective was to include as many subjects as possible, and so all eligible patients admitted on the study days were invited to participate. We have now clarified this in the Methods.

Ethics: "Approval from each Internal Medicine Unit Director and local ethics committee was obtained" – This study was approved by each one of the 24 ethics committees?

- *Authors' response:* Yes, each one of the 24 hospital ethics committees approved the study protocol.

"When BMI was not available, mid-upper arm circumference <25 cm was used as surrogate for BMI <20.5 kg/m2": a reference should be provided for this option.

- *Authors' response:* The mid upper arm circumference option is part of the NRS 2002 tool. We clarified that in the Methods section.

Please correct: "with a p value of 0.05 indicating statistical significance" to "p value < 0.05"

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary correction.

Please cite this "Results were classified as: poor agreement (<0.20), fair agreement (0.20-0.40), moderate agreement (0.41-0.60), good agreement (0.61-0.80), or very good agreement (>0.81)."

- *Authors' response:* We thank the reviewer for pointing this. Upon revision of the latest data on the interpretation of Cohen's Kappa, we realized that the original interpretation of the Cohen's Kappa (from the study from 1977) might have been too lenient for health related studies by implying that a score as low as 0.41 would be acceptable. Therefore, we corrected the classification and added the appropriate reference.

Results: the presentation and analysis of the data are accurate. The results are clear and convincing. "Of the 48 Portuguese public hospitals invited, 24 participated, resulting in 891 patients included." Please replace "included" by "invited", because it is said that "Of the 162 patients that were excluded, 93 had incomplete data, 66 refused to participate, and 3 were rejected for other reasons. A total of 729 participants were included in the analysis." And you only can include those who accepted to participate in this study.

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

Table 1: data presented here are also depicted in Table 3 but in more detail. I recommend to delete Table 1 and to insert Table 2 data in Table 3.

- *Authors' response:* We thank the reviewer for this suggestion. While we feel that this table would be important to allow the reader a broader sense of the general characterization of the study population, we feel that Table 2 does not suit as standalone Table. Therefore, we have now integrated Table 2 into Table 1.

Table 3: Footnote #4 – the correspondent "4" in Table 3 does not exist.

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary corrections.

Discussion: It is well organized but some sentences need further clarification. "While the largest Portuguese study to date (7) showed that the prevalence of malnutrition risk at hospital admission varied between 29% and 47%, another Portuguese study showed a prevalence of malnutrition risk of 42% (18)." Authors should review these included publications, to assess whether prevalence can be reported. Present results should be compared to results from medical patients. As it is stated, it could be confounding.

- *Authors' response:* We thank the reviewer for pointing this. However, there are no Portuguese studies on medical patients alone. This is one of the reasons we performed this study. As this may not have been clearly stated in the discussion, we rephrased that section for clarity.

Since the nutritional screening is already mandatory in Portugal since 2018, the sentence "In a setting with a high prevalence of malnutrition risk where physician assessment does not adequately and systematically identify at-risk patients, our results call for the need for an urgent implementation of mandatory nutritional screening across hospitals" should be adapted.

- *Authors' response:* We thank the reviewer for pointing this out. However, even though nutritional screening is mandatory, it is not yet fully in practice across the country. Our results indicate that the implementation of the mandatory nutritional screening is important. We clarified this in the discussion.

The statement "The major strength of the current study is the large number of participants and the good distribution of participating hospitals across different regions of the country, showing a good representation of this specific Portuguese population." Should be supported with data regarding the good "distribution of participant hospitals" across the country.

- *Authors' response:* We thank the reviewer for this suggestion. We have a good representation of the Portuguese population as also the islands were included in the study. We added the distribution of hospitals per country region in the results section.

"As BMI is just one of the four initial screening questions, and since only one positive question is needed to proceed to final screening, this likely would have not significantly affected final results." BMI is also used in the NRS 2002 Table 2 – Final screening, please revise.

- *Authors' response:* We agree with the reviewer. However, BMI was not the only parameter used in table 2 (final screening). We edited the text to clarify this issue.

Conclusions: In light of my previous comments, they should be corrected and revised.

- *Authors' response:* We thank the reviewer for pointing this. The conclusion was revised according to all the reviewers' suggestions.

References: should be revised because some have journal names in full, some are abbreviated and some are lowercase.

- *Authors' response:* We thank the reviewer for pointing this out. The reference list has been updated according to formatting requirements.

Reviewer: D

O manuscrito realça a importância de se usar métodos quantitativos para a avaliação do risco nutricional na avaliação sistemática dos pacientes e traz novos dados à realidade portuguesa. Acrescentava no título o tipo de estudo que foi realizado (cross-sectional) para se logo pelo título perante que tipo de estudo estamos.

- *Authors' response:* We thank the reviewer for this suggestion. We made the necessary changes

A introdução é clara. Tenho apenas um reparo, na última linha é usada a abreviatura NRS 2002 pela primeira vez no corpo do texto (sem contar com o abstract) pelo deveria ser mencionado novamente no texto o que ela significa.

- *Authors' response:* We thank the reviewer for pointing this out. We made the necessary correction.

Os métodos no geral estão bem, mas deixo em seguida alguns comentários/questões.
− É referido que os colaboradores do estudo "were trained in performing the study measurements during a one-day course", o que é que foi treinado nestes cursos? A duração foi adequada?

- *Authors' response:* We thank the reviewer for pointing this. During our one-day course, we reviewed the evidence behind nutritional screening and assessment, gave instructions on how to use the study protocol including the NRS 2002, and answered all questions from the researchers. To the best of our knowledge, there are no studies addressing the minimum training length for an adequate use of NRS 2002.

- É referido na metodologia que o peso e a altura dos pacientes foram auto-reportados e só se o IMC não estive disponível. Contudo, não é claro o que querem dizer com isto. É que o paciente não sabia a sua altura e/ou peso pelo que não era possível fazer o cálculo do IMC? Ou não estava registado no processo clínico do paciente? Para além disto no último parágrafo da Discussão, o autor refere que o peso e a altura dos pacientes foram estimados. Afinal o peso e a altura foram auto-reportados ou estimados??

- *Authors' response:* We thank the reviewer for pointing this. Weight and height were self-reported and used to calculate BMI. When weight and height could not be reported, we used MUAC as surrogate for BMI. We now clarified the wording of this section.

- O cutoff utilizado na estimativa do IMC através da "mid upper arm circumference" (MUAC) é baseado no conteúdo do NRS 2002, contudo eles colocam a ressalva de que não houve nenhum estudo que tenha demonstrado de forma clara esta relação… Contudo, há um estudo de 2016 (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975446/) que estudou a relação entre a MUAC e o IMC, propondo até uma equação. Percebo que tenham usado a relação mencionada no NRS 2002 (visto até fazer parte do questionário), mas questiono se a mesma não pode ser um viés, devendo o mesmo ser mencionado nas limitações do estudo?

- *Authors' response:* We thank the reviewer for pointing this. However, this is a limitation inherent to the NRS 2002 tool itself. It is our opinion that we should use the tool as it was validated.

- Deve ser mencionado que a escala NRS 2002 está validada para a população portuguesa (colocando a referência do estudo de validação).

- *Authors' response:* Although there is no study validating the NRS 2002 specifically for the Portuguese population, it has been used extensively in the Portuguese Population and it is the malnutrition risk assessment tool adopted by Direção-Geral da Saúde.

- Convém uniformizar e usar "gender" ou "sex" e não ambos.

- *Authors' response:* We thank the reviewer for pointing this. We made the necessary corrections.

- Os resultados estão bem estruturados e são claros. Contudo, é referido que a prevalência de risco nutricional foi de 51%, gostaria de saber se houve diferenças significativas entre os vários hospitais? Nomeadamente entre hospitais centrais e distritais? Entre as várias regiões do país? Poderia ser algo interessante de aprofundar.

- *Authors' response:* We thank the reviewer for this suggestion. We agree that it could be interesting to evaluate the differences between hospitals, but most hospitals only agreed to participate if individual data from each hospital was not displayed in the publication. However, each hospital received the analysis of the data they collected.

- É feita uma boa discussão dos resultados, mas considero que existem mais limitações ao estudo que as reportadas. Algumas delas já mencionei anteriormente. Ainda na secção das limitações é referido "… as BMI is just one of the four initial screening questions, and since only one positive question is needed to proceed to final screening, this likely would have not significatively affected final results" pelo que gostaria de ver mencionado a percentagem de respostas positivas a cada 1 das 4 questões iniciais para podermos avaliar se o mencionado poderá realmente ter ou não impacto significativo nos resultados finais.

- *Authors' response:* We thank the reviewer for pointing this. We edited this section for clarity.

− Na conclusão apenas acrescentava que foi criado em 2019 pela DGS o Rastreio Nutricional.

- *Authors' response:* We thank the reviewer for pointing this. We edited this section for clarity.

Quanto às referências bibliográficas. Convém rever as referências 4 e 20, uma vez que estão incompletas. Por outro lado, a referência 28 já se encontra publicada devendo a mesma ser corrigida.

- *Authors' response:* We thank the reviewer for pointing this out. The reference list has been updated.

Quanto às tabelas:
− Na tabela 1 aparece na legenda a definição da abreviatura AIDS, mas a mesma não aparece em lado nenhum da tabela.

- *Authors' response:* We thank the reviewer for pointing this. We made the necessary corrections.

− Por outro lado, poderia ser útil colocar também na legenda entre que valores varia a Charlson Comorbidity Index ou até a que percentagem de sobrevivência a 10 anos equivale a média e os correspondente desvio-padrão para facilitar ao leitor a interpretação da informação.

- *Authors' response:* We thank the reviewer for this suggestion. We used the validated equation from the Charlson Comorbidity Index to calculate survival at 10 years more accurately and altered the text accordingly. However, we felt it could be more appropriate to leave the survival interpretation in the body of text.

− Na tabela 3 não aparece na legenda a definição da abreviatura AIDS.

- *Authors' response:* We thank the reviewer for pointing this. We made the necessary corrections.

Reviwer: F

Typos:
Pag. 3 Replace "idade média 74 anos," by "idade média 74 anos±colocar valor do desvio padrão", see page 10 in resutls (74.2± 14.6 years)

- *Authors' response:* We thank the reviewer for pointing this. We made the necessary corrections.

The title the title expresses well what is done at the manuscript and the objectives are clearly described. The statistical tests are well presented and the relevance of the work is explained.

The conclusions are as relevant to the health level as to the economic level. The authors indicate the references well, it is in the requested template and the manuscript is clearly written.