

ChatGPT a promising learning tool? An exploratory conversation on food labels



Catarina de Freitas^{1,*}, Tânia Gonçalves Albuquerque², Madalena Bettencourt da Câmara³

¹ Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal; catarinadf9@gmail.com

² National Health Institute Doutor Ricardo Jorge (INSA), Av. Padre Cruz, 1600-609 Lisboa, Portugal; tania.albuquerque@insa.min-saude.pt

³ Egas Moniz Center for Interdisciplinary Research (CiiEM); Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal; mbettencourt@egasmoniz.edu.pt

* Correspondence: catarinadf9@gmail.com

1

Introduction: ChatGPT, a generative pre-trained transformer chatbot developed by OpenAI, was launched in november 30th, 2022¹. This large language model based on Artificial Intelligence (AI) can understand and generate human-like responses using a text-based interface. In six months only, ChatGPT has received great attention by the medical and health sciences communities, including nutrition² and pharmaceutical³(figure 1). One of the potential values of this chatbot is to assist students in their education^{1,4}, as the free application is easily accessible to the general public.

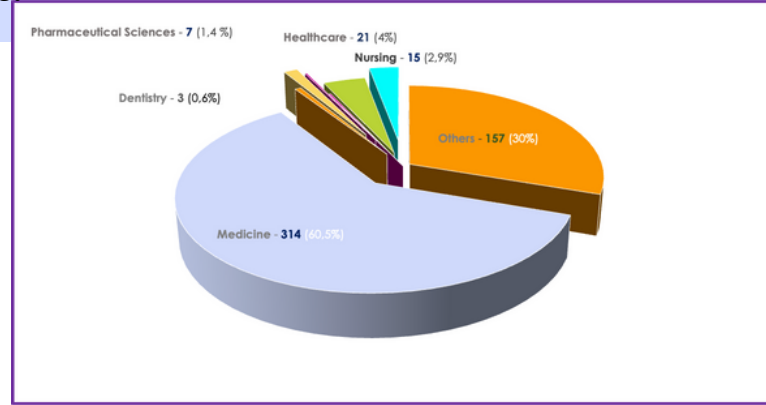


Figure 1 - PubMed search results for "ChatGPT" (12/01/22 - 05/31/23)

The food Portuguese law answers (6/13, 46%) had the lowest median scores, ranging 3 to 4 (IQR 2-3 to 3-4) for accuracy and 2 to 3 (IQR 1-2 to 3-4) for completeness.

The overall accuracy evaluation was good (median - 4; IQR 3-5) but the completeness was more a fair (median - 3; IQR 3-4) as ChatGPT answers don't include references. These results showed that the free version of ChatGPT has limitations accessing information in Portuguese and from images; and our study suggests that ChatGPT is a useful tool for guidance and interpretation of food labels.

2

Objective: Evaluate the accuracy and the completeness of ChatGPT in answering questions regarding knowledge and skills on food labelling regulatory compliance, Nutri-scores validation, nutritional food decoder use and nutritional food recommendations for infants and young children, aged between 0 and 36 months.

3

Materials and Methods : ChatGPT generated answers to 13 questions (figure 2) regarding the themes mentioned above were evaluated by a student and their supervisors (S1 and S2 with greater expertise in food law and public health, respectively) graded for accuracy and completeness (5 point rating scale: 1-not at all; 2-slightly; 3-moderately; 4-very; 5-extremely and complete with additional information) and the scores summarized by descriptive statistics.

4

Results and Discussion: The student and supervisors scores regarding the accuracy and completeness of ChatGPT answers are presented at figure 3.

- Q1 I want to validate food labels regarding their compliance with european union rules, can you help me?
- Q2 Can you help me to gather all the portuguese in force legislation for food labels?
- Q3 How can I check if my food label is compliant with Portuguese legislation?
- Q4 Can you provide me a food label decoder?
- Q5 What do you think about a food product with a nutriscore E?
- Q6 Can you calculate the nutriscore of a food?
- Q7 Can you check if the nutriscore of a food is correctly calculated?
- Q8 I am a pharmacist and I need to choose the best milk formula for a baby that have lactose intolerance, can you help me?
- Q9 Can you help me to gather all the Portuguese in force legislation for foods for babies until 36 months?
- Q10 Can you check if a food label is compliant with EU regulations?
- Q11 Can you check if the nutritional and/or health claims on these labels are compliant with EU rules?
- Q12 Can you tell me which countries use the Nutri-Score and why portugal don't use the nutriscore?
- Q13 Can you compare the Nutri-Score with other nutrition labels?

Figure 2 - Questions answered by ChatGPT

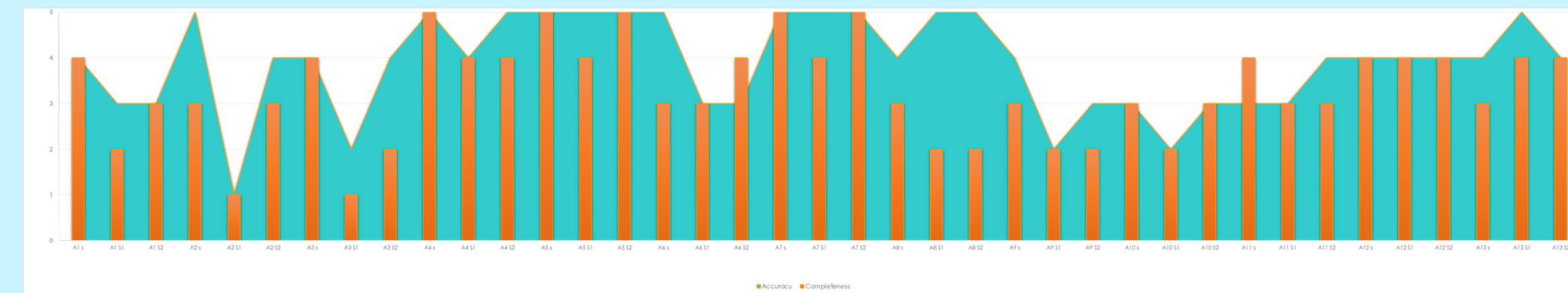


Figure 3 - Student (s) and supervisors (S1,S2) scores for the accuracy and completeness of ChatGPT answers

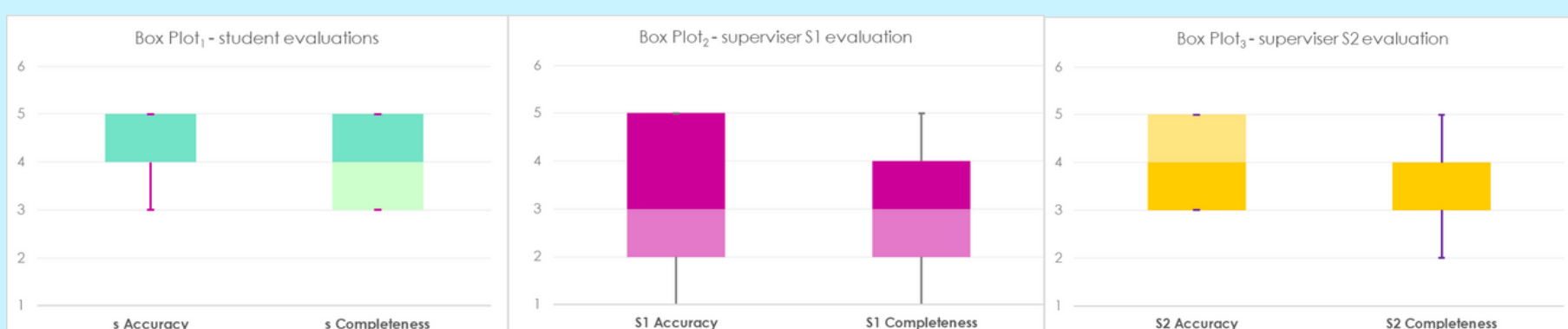


Figure 4 - Median and IQR for the student and supervisors evaluations (Box Plots 1,2,3 respectively)

The student accuracy median score and the interquartile range (IQR) for all ChatGPT answers reviews were 4 (4-5), respectively; the corresponding supervisors values were 3 (2-5) (S1) and 4 (3-5) (S2); the student median completeness score and IQR values were similar to the accuracy ones 4 (3-5); their supervisors values were 3 (2-4) (S1) and 4 (3-4) (S2) (figure 4).

6

References:

- 1 - Sallam M. (2023). ChatGPT Utility in Healthcare Education, Research, and Practice: Systematic Review on the Promising Perspectives and Valid Concerns. Healthcare (Basel, Switzerland), 11(6), 887. <https://doi.org/10.3390/healthcare11060887>; 2 - Arslan S. (2023). Exploring the Potential of Chat GPT in Personalized Obesity Treatment. Annals of biomedical engineering, 10.1007/s10439-023-03227-9. Advance online publication. <https://doi.org/10.1007/s10439-023-03227-9>; 3 - Moingeon P. (2023). Artificial intelligence-driven drug development against autoimmune diseases. Trends in pharmaceutical sciences, 44(7), 411-424. <https://doi.org/10.1016/j.tips.2023.04.005>; 4 - Tong, Y., & Zhang, L. (2023). Discovering the next decade's synthetic biology research trends with ChatGPT. Synthetic and systems biotechnology, 8(2), 220-223. <https://doi.org/10.1016/j.symbio.2023.02.004>;

