Caregivers' Experience of using an AI-driven Interactive Calculator Chatbot App (Met Bot) for calculating protein and amino acid intakes in Children with Inborn Errors of Metabolism

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Introduction

Inborn errors of metabolism (IEM) are wide-ranging and for some conditions, it is essential to be on a "diet for life", from birth onwards.

For a specific group of conditions involving protein and amino acid metabolism, diet is especially important to prevent accumulation of toxic substances which can lead to brain damage and even death. However, on the other hand, over-restriction in intake can lead to poor growth and nutritional deficiencies

Problem

Caregivers of children with inborn errors of protein and amino acid metabolism often rely on the dietitians to adjust their child's diet during their 6-12 monthly consultations, resulting in over-restriction in intake.

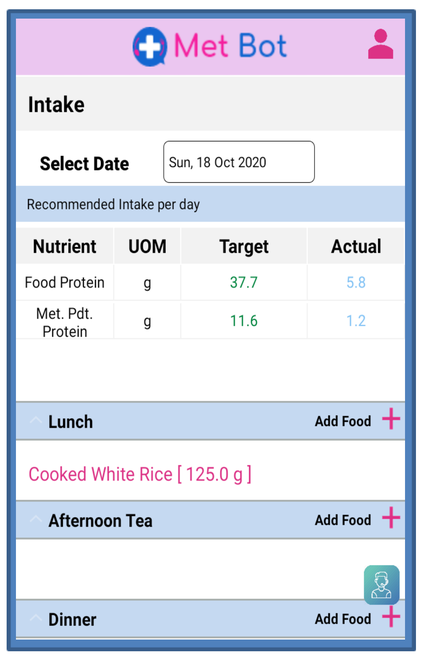
Hence, the study team developed an AI-driven interactive calculator chatbot app (Met Bot) to empower caregivers of children to be self-reliant in monitoring and adjusting their child's diet

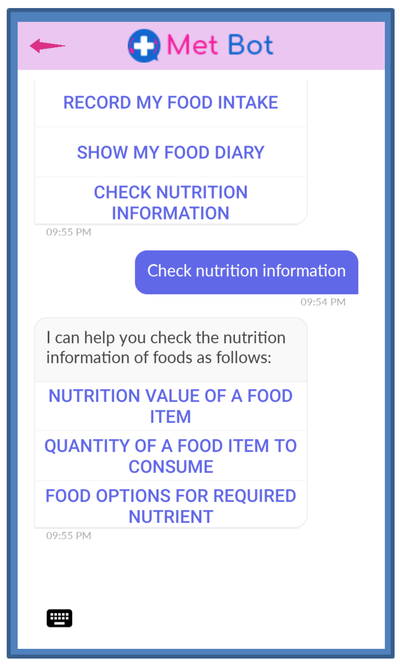
Methodology

A prototype Met Bot was developed consisting of:

(A) Nutrition Calculator with information on 8 nutrients
(energy, carbohydrate, protein, metabolic product protein, leucine, lysine, methionine and phenylalanine)

(B) Chatbot "Lynn" providing information on the nutrient content of foods as well as food options





28 caregivers were pre-screened to trial the Met Bot for 6 months, and their confidence in making changes to their child's diet by (i) giving new foods and (ii) adjusting the diet independently, was assessed using a 5-point Likert scale.

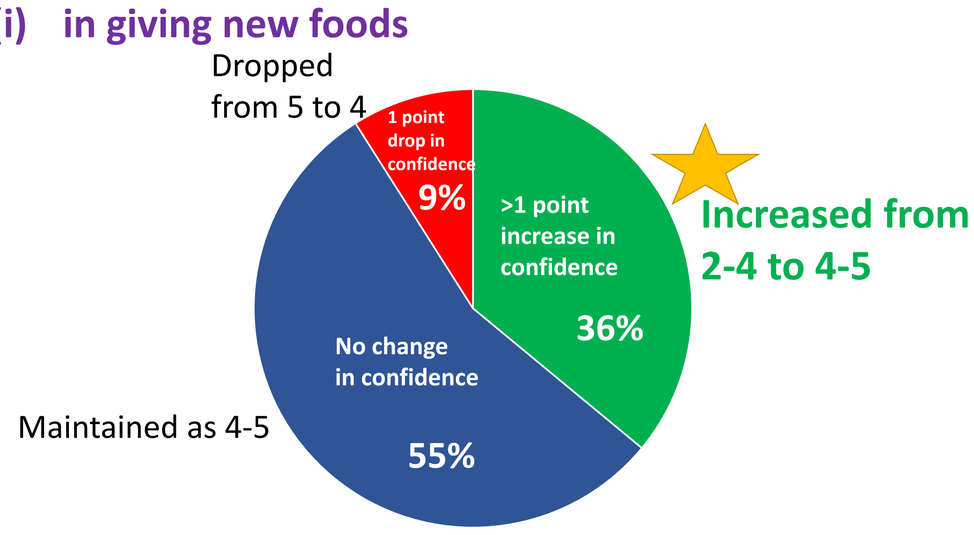
Resources available to caregivers during the trial included :
(a) a face-to face group demonstration, (b) printed user guide, and (c) Whatsapp support group with the research coordinator, metabolic nurse and dietitian

Results

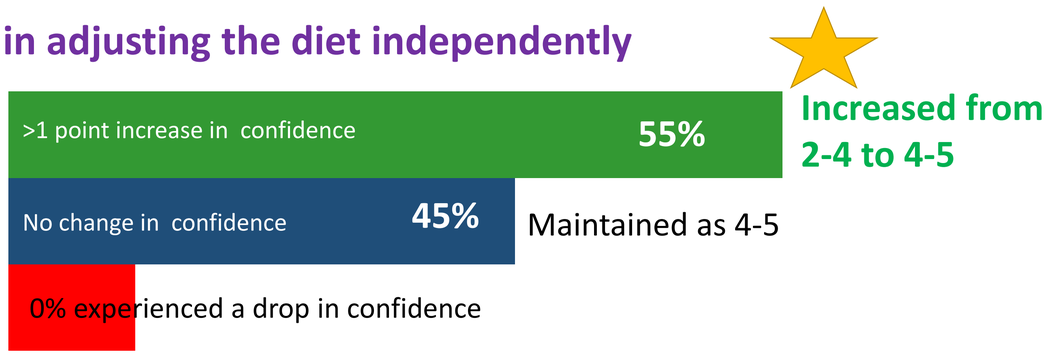
I) Participation

II) Confidence (pre-study and after 6 months of using the Met Bot, ratings on a 5-point Likert scale) **:**

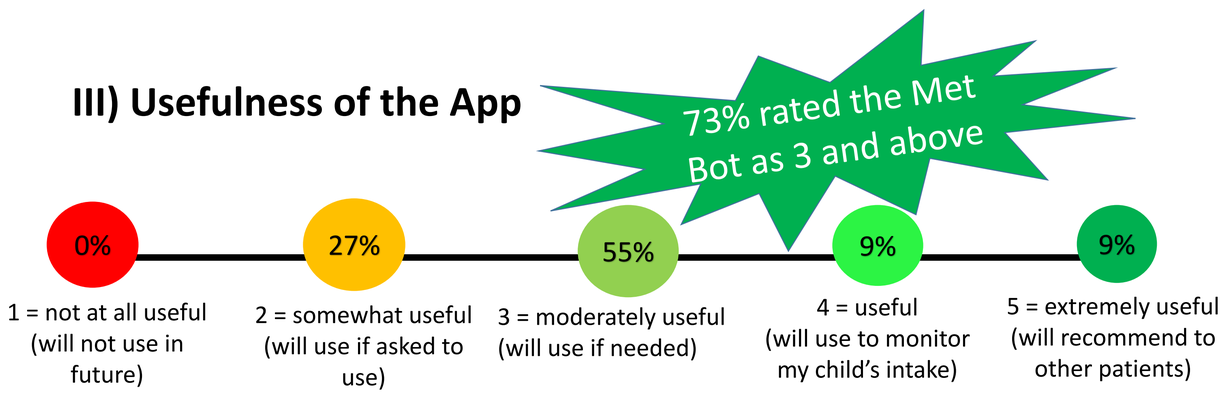
(i) in giving new foods



(ii) in adjusting the diet independently



III) Usefulness of the App



Conclusion

- Overall, **35% of caregivers were using the Met Bot App** to monitor their child's diet at the end of the study period and **70% rated the Met Bot as easy-extremely easy to use**.
- In light of these results, funding is now being sought to sustain the Met Bot and to **enhance** it to benefit patients with other inborn errors of metabolism.
- As **Artificial Intelligence (AI)** technology becomes more ubiquitous, we believe that **AI** can be used to **empower caregivers** to **be self-reliant** in monitoring and adjusting their child's diets.