

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTS OF CARBOHYDRATE MOUTH  
RINSE ON EXERCISE PERFORMANCE AND  
PSYCHOLOGICAL STATE: A SYSTEMATIC  
REVIEW**

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**BSc**

**July 2021**

## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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## ABSTRACT

Despite the increased number of studies investigating the effects of carbohydrate (CHO) mouth rinse on exercise performance and psychological state, the systematic review was inconclusively explained to allocate effectiveness of the CHO mouth rinse on endurance exercise (time trial (TT) or time to exhaustion (TTE)). The objective of the review was to provide review related the effects of CHO mouth rinse on exercise performance and psychological state. The review was conducted by using following databased: PubMed and Google Scholar. The methodology used include the identification, screening, eligibility that involved the inclusion and eligible criteria to choose appropriate data. Twenty studies were classified as final appropriate results. The results shown that usually endurance exercises (~1 h duration, intensity ~75% VO<sub>2</sub>max) were performed (cycling, running), except intermittent exercise and maximal incremental exercise. Mostly studies involved only male participants, while two studies for both gender and one study for only female (n= 224). There was a large variation in mouth rinse protocols between the studies including: (1) duration of mouth rinse normally 5-10s; (2) the concentration of the CHO solutions basically 6.4% but in certain studies (3% - 16%); and (3) CHO solutions basically used maltodextrin (MALT) in their studies, but certain studies have been used sucrose, glucose, dextrose and other design CHO solution appropriated towards the studies. Seven studies shown no effects or improvement towards exercise performance by rinse the CHO while the others shown improvement (Improve + 1.5%-29%). For psychological state, RPE was used as the most famous measurement during all the studies. Surprisingly, majority studies shown no enhancement of CHO mouth rinse towards RPE. Four studies shown that RPE influenced (+ 0.7%-25%). FAS and FS were used within three studies while POMS and GI rarely used only in two studies. FAS (15.4%) and FS (44%) increased in one study respectively for both indicators. Only one study does not measure psychological indicator at all. Researchers have their own arguments for the effectiveness of CHO mouth rinse either positively or negatively. In conclusion, the present review clarified that CHO mouth rinse gave ergogenic benefits normally positively, it also can be negatively towards exercise performance. While it was not really giving positive results on psychological indicators especially RPE.

***Keyword: Carbohydrate mouth rinse, exercise performance, psychological state***

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