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The Effect of Probiotics on the Development of Oral Cancer: A Systematic Review and Meta-Analysis

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Introduction: The prevalence of oral cancer has been reported annually along with high mortality rate. Probiotics have been suggested to possess anti-cancer properties, however the role of these microorganisms on oral cancer is remain unclear. The objective of the present study is to identify the mechanisms exerted by probiotics on oral carcinogenesis by using systematic review and meta analysis with the hypothesis that probiotics inhibit oral carcinogenesis. **Materials and method:** Comprehensive literature search was conducted on PubMed, Scopus and Web of Science electronic database from January 2019 until April 2019. Main keywords that were used are “probiotic” AND “oral cancer”. Articles that were published in English language were included in this review. Articles were selected independently by three authors and inspected independently by another researcher. The titles and abstracts of the studies were screened to identify studies that meet the inclusion criteria. Full text articles of the remaining studies were assessed to determine the availability to be included in the review. Meta-analysis was conducted by using RevMan 5 software, and the result was graphically plotted on the forest plot. This review was done according to the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA-P) 2015 guidelines. **Results:** After thorough screening of the full text articles, seven papers were eligible to be included in the systematic review. The included articles were mainly discussed on the association of probiotics and oral cancer. Two from the seven papers were selected to be analyse for quantitative synthesis (meta-analysis). The present study also showed that, *Lactobacillus salivarius* REN produces protective effect from developing neoplastic tongue lesions with odd ratio < 1. **Conclusion:** Probiotics were found to confer positive effect as an inhibitory agent against the oral carcinogenesis thus supported the hypothesis of the present study that probiotics can inhibit oral carcinogenesis.