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The Association of Sugar and Sugar Substitutes to Breast, Lung, and Oral Cancer Cell Lines: A Scoping Review
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Abstract
Cancer which synonymously known as neoplasia is a genetic disorder of cell growth that is triggered by acquired or less commonly inherited mutations affecting a single cell and its clonal progeny. The aims of this scoping review was to investigate the role of sugar and sugar substitutes in breast, lung, and oral cancers with a hypothesis that sugar promoted carcinogenesis. Three databases (EBSCO, PubMed, and Scopus) were searched from January 2010 to December 2021 to identify the preclinical studies eligible for this scoping review. The review was performed according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) guidelines. A total of 361 articles were reviewed and the qualitative synthesis used 12 of these articles. Based on the qualitative synthesis, four studies reported dietary sugar (glucose- and/or sucrose) induced cancer progression, one study revealed sugar substitute (aspartame) induced cancer proliferation, seven studies reported that sugar substitutes inhibit cancer proliferation, and one study reported that sucrose promotes cancer while xylitol inhibits cancer. In addition., it was reported that D-allose and cisplatin have a synergistic effect in treating cancer. In conclusion, simple sugar intake is associated with an increased risk of carcinogenesis. In contrast, sugar substitutes inhibit cancer cell line progression, subsequently acting as a potential cancer therapy, thus supporting the study's hypothesis.

Author Keywords
Cancer risk factors; carcinogenesis; sugar; sugar substitutes

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