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Study protocol

Citation

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A citation network analysis of reviews considering the relationship of low-energy sweeteners (LES) with body weight. 2020.

Review questions

1. What is the pattern of citations in reviews considering the relationship of low-energy sweeteners (LES) with body weight (BW)?

2. Which determinants influence the likelihood of publications being cited?

3. Is there evidence of citation bias? (exploratory objective)

Hypothesis

The null hypothesis to be tested is that there are variations in the pattern of studies cited as evidence in reviews assessing the relationship of LES with BW and obesity risk outcomes are not related to the characteristics of the cited studies.

Searches

The literature search will be conducted in Web of Science Core Collection. This database enables us to download the publications together with all corresponding citation paths, required for developing the data set. No identification via reference checking will be done, since this can lead to an overrepresentation of articles that are cited within the network. Only articles published in English are included. There is no restriction with regard to publication year.

Search strategy

The search will include "all fields". Table S1 shows an overview of search terms.

Search string:

("High-intensity sweetener$" OR "High intensity sweetener$" OR "high-potency sweetener$" OR "high potency sweetener$" OR "intense sweetener$" OR "artificial sweetener$" OR "low-calorie sweetener$" OR "low calorie sweetener$" OR "low-caloric sweetener$" OR "low caloric sweetener$" OR "low-energy sweetener$" OR "low energy sweetener$" OR "non-caloric sweetener$" OR "no-calorie sweetener$" OR "no calorie sweetener$" OR "non-nutritive sweetener$" OR "sugar-free sweetener$" OR "sugar free sweetener$" OR "sugar-free product$" OR "sugar free product$" OR "reduced-sugar sweetener$" OR "reduced sugar sweetener$" OR

"reduced-sugar product$" OR "reduced sugar product$" OR "sweetening agent$" OR "sugar replacer")

AND

("Body weight" OR obesity OR overweight OR adiposity)

AND

("Narrative review" OR "systematic review" OR "mini$review" OR review OR commentary OR opinion OR perspective OR meta-analys$s OR "meta analys$s" OR "consensus statement$" OR "consensus report" OR "position statement$" OR "position report" OR "scientific statement$" OR "scientific report")

Types of study to be included

Systematic reviews with or without meta-analysis as well as narrative reviews evaluating the effect or association of LES on body weight.

Condition or domain being studied

The pattern of citations, including evidence of citations bias, in reviews examining the relationships (observed effects or associations) of LES with body weight.

Participants/population

Reviews assessing human studies with adults as well as children and animal studies are included.

Intervention(s), exposure(s)

Exposure to LES in relation to body weight.

Comparator(s)/control

The same intervention without inclusion of LES (experimental trials); No or lower exposure to LES (cohort/observational studies)

Context

Table S2 shows an overview of the criteria, which have to be fulfilled to be included in this study.

Cited papers are included or excluded from the analysis depending on the context in which they are used. Cited papers are clearly included where they are an explicit part of the empirical evidence base used for evaluating the effects or association of human exposure to LES on obesity or BW -related outcomes. Obesity or BW -related outcomes of interest include body weight, BMI, risk of obesity or weight gain, and other outcomes commonly used as indicators of

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relative body weight of fatness (fat mass, percent body fat, waist circumference, skinfold thickness, adiposity). Citations describing body weight outcomes in animal studies are only included where they are used in this same context, and integrated into the narrative on body weight or obesity risk in humans.

Citations are excluded where they are used in other contexts such as:

– Introductory descriptions of the general topic area or current public health guidance

– Evidence limited to potential underlying mechanisms or hypotheses, e.g. appetite control, energy intake or expenditure, adipogenesis, diet quality, etc

– Cited but not used in quantitative and qualitative evidence assessments in systematic reviews or meta-analyses.

– Animal studies clearly in the context of narrative around effects in animals

– Evidence limited to visceral fat mass or ectopic fat as outcomes

– Evidence limited to other health outcomes including metabolic syndrome

– Part of an inventory (simple listing or description) of the specific papers that are/are not cited in other reviews

Main outcome(s)

Pattern and determinants of citations in reviews examining the effect or association of LES on body weight.

Timing and effect measures

Odds ratios for the likelihood of being cited from different characteristics of the review and primary research cited.

Additional outcome(s)

-

Timing and effect measures

-

Data extraction (selection and coding)

Two reviewers will independently perform the following steps:

1. Screening of title and abstract to identify potentially relevant papers

2. Full text screening of identified papers from step 1 to confirm that relevant papers meeting the inclusion criteria, are correctly identified and data for the required outcome measures are reported.

3. Data extraction from the identified papers through a standardized form, which will represent relevant article characteristics and thus potential determinants of citation. Data extraction will be based on the procedure of Urlings et al. (1). Article characteristics are likewise based on this approach.

Any discordance will be discussed and/or resolved by a third reviewer.

Article characteristics – potential determinants of citation

Each article will be scored on the potential determinants of citation. This will be done independently by two authors. Potential determinants of selective citation are article characteristics that can be present in both the cited and the citing article. Concordance between the characteristics of the cited and citing article will be assessed. Article characteristics will primarily be extracted from the title and abstract. Table S3 shows an overview of article characteristics and subsequent operationalization.

The extraction includes the following characteristics:

- Study outcome - Reviews 1) author's stated conclusion and 2) BW as either significant decreasing or increasing (p<0.05) or no statistically significant effect from statistical analyses of effects or associations (Only reviews including meta-analysis)
- Study outcome – Primary studies: Main message
- Article type
- Population, only human studies
- Sample size, only primary studies
- Number of authors
- Journal impact factor: 1) Current journal impact factor (2018), 2) Journal impact factor from the last five years (as a mean)
- Funding source, only reviews
- Affiliation of the corresponding author, only reviews
- Affiliation of the first author, only reviews
- Number of relevant cited studies, only reviews
- Number of own publications cited in the section concerning BW, only reviews
- Years since cited paper was published: Defined as year of the review-year of the cited research paper, only primary studies

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Strategy for data synthesis

Data synthesis will be based on the method by Urlings et al. (1). Articles will only be included in the data synthesis if their citation data are electronically retrievable. Data synthesis consist of 3 steps:

1. Quantification through data analysis

Logistic regression will be used to quantify the effects of the above characteristics on likelihood of being cited. Both univariate and multivariate model will be considered. If more reviews contains more than one conclusion, logistic mixed-effects regression will be used. The results will be odds ratios of the likelihood of being cited according to the different characteristics.

2. Visualization through network analysis

Visualization of the citation network will be done if time permits. Dots will represent the articles in the network and arrows between the dots will represent the citations between the articles. This gives a nice overview of the connections between the citing and cited articles in the network.

3. Evidence of citation bias

Evidence of citation bias will be assessed as an exploratory outcome, pending suitability of the data and methods

The statistical analyses will be conducted in R-studio.

Analysis of subgroups or subsets

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Contact details for further information

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Missing data

Missing data is expected due to unavailability. One example could be if a journal no longer exist.

Organizational affiliation of the review

University of Copenhagen

Review team members and their organizational affiliations

MSc. In Human Nutrition Mie Normand, University of Copenhagen

Professor Christian Ritz, University of Copenhagen

Dr. David Mela, Retired, Valkenswaard NL

Professor Anne Raben, University of Copenhagen

Type and method of review

Citation network analysis

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Anticipated or actual start date

01 February 2020

Anticipated completion date

30 May 2020

Funding sources/sponsors

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Conflicts of interest

Anne Raben has received financial support from Unilever and International Sweeteners Association (ISA). Furthermore, she is project co-coordinator of the EU Horizon 2020 projectSWEET, grant number 884293. David Mela is a former employee of Unilever.

Language

English

Country

Denmark

Stage of review

Review on going

References

1. Urlings MJ, Duyx B, Swaen G, Bouter LM, Zeegers MP. Preparation of research method: an application of dietary intake of industrially produced trans fatty acids and its effect on cholesterol levels in human blood. Protocol: Citation analysis. 2015. 1-22

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