



**Dental
Examinations
Executive**

Dental Specialty Fellowship Examination

Part 1

Dental Public Health

Critical Appraisal

Note: Parts of the sections within the original article are not relevant to this examination and have been redacted.

Please note that the sample answer key provided has model answers and they are not exclusive. Other options could be considered as correct answers.

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Part 1

Extract - 31 marks

Jiang, X., Jiang, X., Wang, Y., and Huang, R. 2019. Correlation between tobacco smoking and dental caries: A systematic review and meta-analysis. *Tobacco Induced Diseases*, 17(April), 34. doi: 10.18332/tid/106117. Creative Commons Attribution 4.0 International License: <https://creativecommons.org/licenses/by/4.0/>

Model Answers:

1. Discuss whether the research question developed by the authors reflected identified gaps in the evidence. **(3 marks)**

Up to 3 marks from:

- References are given for association between tobacco smoking and oral health but not caries specifically **(1 mark)**
- Trials are mentioned but not referenced **(1 mark)**
- There is insufficient justification given **(1 mark)**
- Effect of tobacco on oral bacteria is mentioned (in the discussion) as a possible plausible mechanism for impact on caries **(1 mark)**
- The authors state that there has been no systematic review of the topic 'in the last 5 years' but do not reference any older reviews **(1 mark)**

2. Discuss the extent to which the research question was suitably focussed and how it could be improved. **(2 marks)**

- Primary aim of the review to evaluate the association between tobacco smoking and dental caries is suitably focussed **(1 mark)**
- The adult population could be better defined **(1 mark)** for example young adults or older adults or different income countries

3. Discuss the extent to which the authors included appropriate types of study to address their aims. **(3 marks)**

Up to 3 marks from:

- Authors included observational studies of tobacco smokers/non-smokers only but interventional studies might have been included and authors have assumed these were not available **(1 mark)**
- Both case-control and cohort studies included which was appropriate because RCTS impractical and of better quality than observational studies alone **(1 mark)**

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- Inclusion criteria of needing a non-smoking group for comparison possibly excluded some studies looking at dose-response within smoking group e.g. heavy smokers compared with occasional smokers **(1 mark)**
 - Restriction to English language studies only is inappropriate (smoking and caries are globally present) **(1 mark)**
4. Comment on the robustness **(2 marks)** and potential limitations **(2 marks)** of the processes used by the authors to include all the important and relevant studies. **(4 marks total)**

Up to 2 marks from each section

- Robustness:
 - Authors describe developing multiple relevant electronic search terms **(1 mark)**
 - Authors describe searches across multiple databases **(1 mark)**
 - Systematic approach **(1 mark)**
 - Two reviewers used to assess articles **(1 mark)**
 - Potential limitations:
 - No explanation of how search terms were chosen for sensitivity/specificity **(1 mark)**
 - No mention of use of backward/forward citation **(1 mark)**
 - No search for grey literature studies **(1 mark)**
 - No call for unpublished studies from potential informants **(1 mark)**
5. Discuss the extent to which the review process used by the authors was sufficient to assess the quality of the included studies. Justify your answer with reference to the processes used. **(2 marks)**
- Use of a tool - Newcastle-Ottawa Scale to assess methodological quality (a positive) **(1 mark)**
 - Two reviewers used to assess quality (a positive) **(1 mark)**
6. Regarding the 11 studies that met the authors' criteria, comment on whether the populations **(4 marks)**, exposures **(3 marks)** and outcomes **(1 mark)** were appropriate to meet the aims of the review. **(8 marks total)**
- Populations - not fully meeting review aims - studies of men only **(1 mark)**; age range not reported in some studies which further limits the review **(1 mark)**; mix of countries so hard to interpret findings

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- (1 mark), some highly specific populations, e.g. drivers, which makes it hard to interpret findings (1 mark)
 - Exposure - mostly self-reported which may introduce reporting bias (1 mark) and recollection bias (1 mark); unclear whether duration of smoking was measured (measurement bias) (1 mark)
 - Inclusion of older adults in some studies may render DMFT index increasingly invalid (1 mark) as teeth may have been filled or extracted due to reasons other than caries
7. Comment on whether it was appropriate to combine the results of the studies in figures 2 and 3 for meta-analysis. (3 marks)
- Only combined DMFT/DMFS studies that reported standard deviation (a positive) (1 mark)
 - Results of pooled studies were similar (a positive) (1 mark)
 - Unclear whether ages of smokers and non-smokers were similar (1 mark)
8. Ethically, what studies could be considered further to explore the association between smoking and caries? (6 marks)
- Cross-sectional studies of specific age groups and similar age/gender/social class mix in exposed/non-exposed groups (1 mark) and/ or confounder control in analysis (1 mark)
 - Case-control studies (1 mark)
 - Longitudinal studies looking at development of caries over time (1 mark)
 - Improvement to exposure assessment/inclusion of duration of smoking in cross-sectional and case-control studies (1 mark)
 - Improvement to outcome measure to focus better on caries experience (1 mark)

Total Marks for Extract = 31