

Optional individual task: critical analysis of a scientific publication in dental medicine

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The task

Optional — not compulsory and not graded. Students who want extra practice and individual feedback can appraise **one** published study in dental medicine and writes a structured critical analysis of **at most 1,000 words** (two A4 pages, 11-pt font), following the template below. The aim is not to summarise the abstract but to judge **how far the authors' conclusions can be trusted** and whether they apply to patients in Bulgaria.

1. Choose a paper from the shortlist, **or** propose your own original study or systematic review (indexed in PubMed, Scopus or Web of Science, with a DOI). A student-selected paper must be approved by the teacher before you start.
2. Identify the study design and appraise it with the matching checklist: CASP (casp-uk.net) or JBI (jbi.global/critical-appraisal-tools) — e.g. the JBI prevalence checklist for Gillison or Eke, the CASP qualitative checklist for Cohen.
3. Write the analysis in the eight sections of the template.

Handing it in (optional)

- **No deadline:** hand it in whenever you are ready during the semester; you get written feedback.
- **Format:** PDF, at most 1,000 words (two A4 pages, 11-pt font), file name surname-group-appraisal.pdf.
- **Route:** give it to the teacher in class or by e-mail.
- **Appendix:** the completed CASP or JBI checklist (not counted in the page limit).
- **References:** Vancouver style, with DOI.

Academic integrity

The analysis and judgement must be your own work. Language-editing tools, including AI tools, may be used only to improve the English, not to produce the appraisal. Quotations from the paper are marked and referenced. You may be asked to explain any part of your analysis orally.

Template: the eight sections of the critical analysis

#	Section	What to write
1	Reference	Full reference in Vancouver style, with DOI.
2	Question	The research question in a design-appropriate framework: PICO (intervention), PECO (exposure), population–condition–context (prevalence) or PICo — population, phenomenon of interest, context (qualitative). The authors' aim, and their hypothesis if one is stated.
3	Design and methods	Study type and why you classify it so; setting and period; participants, sampling and sample size; exposure or intervention; outcome and how it was measured (e.g. DMFT, attachment loss, implant failure).
4	Main results	The key estimate with its 95% confidence interval (prevalence, OR, RR, HR, mean difference, prevented fraction), or the main themes of a qualitative study. Distinguish statistical from clinical significance.
5	Validity	Checklist used and its main findings, specific to the design — prevalence: sampling frame, non-response, survey weighting, measurement; case-control/cohort: selection, measurement of exposure, confounding, loss to follow-up; RCT: allocation concealment, blinding of assessors, missing outcomes, analysis by assigned group; qualitative: recruitment, reflexivity, credibility, supporting quotations; review: search, selection, extraction, appraisal, synthesis. Note the unit of analysis (patient, tooth, surface, implant).
6	Reporting and integrity	Matching reporting guideline (STROBE, CONSORT, PRISMA, COREQ, STARD...) used to find the information you need. Older papers predate some guidelines: distinguish "not reported" from "not done". Registration, ethics approval and consent (or why not applicable); funding and conflicts of interest.
7	Applicability	Are participants, setting and intervention comparable to patients in Bulgaria? What would change in clinical practice or in dental public health?
8	Conclusion	Your overall judgement in 2–3 sentences.

Example — how sections 4 and 5 might read (OPT trial, discussed in class)

4. Main results. Scaling and root planing improved periodontal measures ($P < 0.001$) but did not demonstrate a reduction in preterm birth before 37 weeks: 12.0% (49/407) in the treatment group vs 12.8% (52/405) in the control group, hazard ratio 0.93 (95% CI 0.63–1.37). The interval includes 1 and is compatible with anything from a 37% lower to a 37% higher hazard: both a clinically important benefit and harm remain compatible with these data.

5. Validity. Randomisation of 823 women balances known and unknown prognostic factors, such as smoking and socioeconomic position, in expectation (chance imbalances can remain); such factors may explain the association seen in earlier observational studies. The trial was registered (NCT00066131) and the primary outcome was prespecified. A limitation is the timing: treatment was completed before 21 weeks, and it remains open whether earlier treatment would have made a difference. The trial tests this treatment regimen; it does not show that periodontitis has no causal role.

Michalowicz BS et al. *N Engl J Med* 2006;355:1885–1894. doi:10.1056/NEJMoa062249. If you choose this paper, the example cannot be reused: write your own analysis of all eight sections.

Feedback criteria (20 points, for self-assessment and feedback only)

Criterion	Points
Question framed with a design-appropriate framework	2
Design correctly identified and justified; appropriate check-list	3
Methods described accurately (participants, sampling, measurement)	2
Main results with effect size and 95% CI (or themes)	3
Validity: design-specific sources of bias, with examples from the paper	5
Reporting guideline, ethics, funding, conflicts of interest	2
Applicability and own reasoned conclusion	2
Structure, academic English, Vancouver reference with DOI	1
Total	20

Scores well: an argued judgement that uses the paper's own numbers, tables and stated limitations.

Scores poorly: a paraphrase of the abstract; "the study was good"; statements not linked to the text of the paper.

Useful reading: reporting guidelines at the EQUATOR Network (equator-network.org); risk-of-bias tools RoB 2 (doi:10.1136/bmj.l4898) and ROBINS-I (doi:10.1136/bmj.i4919); AMSTAR 2 for systematic reviews (doi:10.1136/bmj.j4008).

Shortlist of papers

Reference	Design
Gillison ML, Broutian T, Pickard RK, et al. Prevalence of oral HPV infection in the United States, 2009–2010. <i>JAMA</i> 2012;307:693–703. doi:10.1001/jama.2012.101	cross-sectional
Eke PI, Dye BA, Wei L, et al. Prevalence of periodontitis in adults in the United States: 2009 and 2010. <i>J Dent Res</i> 2012;91:914–920. doi:10.1177/0022034512457373	cross-sectional
D'Souza G, Kreimer AR, Viscidi R, et al. Case-control study of human papillomavirus and oropharyngeal cancer. <i>N Engl J Med</i> 2007;356:1944–1956. doi:10.1056/NEJMoa065497	case-control
Poulton R, Caspi A, Milne BJ, et al. Association between children's experience of socioeconomic disadvantage and adult health: a life-course study. <i>Lancet</i> 2002;360:1640–1645. doi:10.1016/S0140-6736(02)11602-3	cohort
Michalowicz BS, Hodges JS, DiAngelis AJ, et al. Treatment of periodontal disease and the risk of preterm birth. <i>N Engl J Med</i> 2006;355:1885–1894. doi:10.1056/NEJMoa062249	RCT
Tonetti MS, D'Aiuto F, Nibali L, et al. Treatment of periodontitis and endothelial function. <i>N Engl J Med</i> 2007;356:911–920. doi:10.1056/NEJMoa063186 (read with the 2018 correction, <i>N Engl J Med</i> 2018;378:2450, doi:10.1056/NEJMc180022)	RCT
Cohen SM, Fiske J, Newton JT. The impact of dental anxiety on daily living. <i>Br Dent J</i> 2000;189:385–390. doi:10.1038/sj.bdj.4800777	qualitative
Chrcanovic BR, Albrektsson T, Wennerberg A. Smoking and dental implants: a systematic review and meta-analysis. <i>J Dent</i> 2015;43:487–498. doi:10.1016/j.jdent.2015.03.003	SR + meta-analysis
Marinho VCC, Worthington HV, Walsh T, Clarkson JE. Fluoride varnishes for preventing dental caries in children and adolescents. <i>Cochrane Database Syst Rev</i> 2013;(7):CD002279. doi:10.1002/14651858.CD002279.pub2	SR + meta-analysis
Walsh T, Worthington HV, Glenny AM, et al. Fluoride toothpastes of different concentrations for preventing dental caries. <i>Cochrane Database Syst Rev</i> 2019;3:CD007868. doi:10.1002/14651858.CD007868.pub3	SR + network meta-analysis

Full text: through the MU-Plovdiv Library and Information Centre (remote access via login.ezproxy.mu-plovdiv.bg with the personal username and password issued by the library), PubMed Central or the Cochrane Library.