Supplements

Table S1. Search strategies for each database.

	PubMed	Cochrane Library	Scopus	Web of Science
Search terms, combinations	("Zirconium"[Mesh] OR zirconium OR zirconia OR zirconium dioxide OR Y-TZP) AND (translucent OR "monolithic" OR "full anatomical" OR "full contour" OR cubic OR multilayer OR FSZ OR 4Y-TZP OR 5Y-TZP) AND ("computer aided manufacturing" OR milling OR "CAD CAM" OR sintering OR heat OR "Heating"[Mesh] OR heating OR firing OR staining OR infiltrating OR "Color"[Mesh] OR color OR shade OR sandblasting OR airborne-particle abrasion OR glazing OR polishing OR grinding OR aging OR fatigue OR thermocycling OR thermal cycling OR LTD OR "low temperature degradation" OR wear OR abrasion)	([mh Zirconium] OR (zirconium):ti,ab,kw OR (zirconia):ti,ab,kw OR (zirconium dioxide):ti,ab,kw OR (Y-TZP):ti,ab,kw) AND ((translucent):ti,ab,kw OR ("monolithic"):ti,ab,kw OR ("full anatomical"):ti,ab,kw OR ("full contour"):ti,ab,kw OR (cubic):ti,ab,kw OR (multilayer):ti,ab,kw OR (fsz):ti,ab,kw OR (4y-tzp):ti,ab,kw OR (5y-tzp):ti,ab,kw) AND (("computer aided manufacturing"):ti,ab,kw OR (milling):ti,ab,kw OR ("CAD CAM"):ti,ab,kw OR (sintering):ti,ab,kw OR (heat):ti,ab,kw OR [mh Heating] OR (heating):ti,ab,kw OR (firing):ti,ab,kw OR (staining):ti,ab,kw OR (infiltrating):ti,ab,kw OR [mh Color] OR (col*r):ti,ab,kw OR (shade):ti,ab,kw OR (sandblasting):ti,ab,kw OR (airborne-particle abrasion):ti,ab,kw OR (glazing):ti,ab,kw OR (polishing):ti,ab,kw OR (grinding):ti,ab,kw OR (aging):ti,ab,kw OR (fatigue):ti,ab,kw OR (thermocycling):ti,ab,kw OR (thermal cycling):ti,ab,kw OR (LTD):ti,ab,kw OR ("low temperature degradation"):ti,ab,kw OR (wear):ti,ab,kw OR (abrasion):ti,ab,kw)	TITLE-ABS-KEY(zirconia OR "zirconium dioxide" OR y-tzp) AND TITLE-ABS-KEY(translucent OR "monolithic" OR "full anatomical" OR "full contour" OR cubic OR fsz OR 4y-tzp OR 5y-tzp) AND TITLE-ABS-KEY("computer aided manufacturing" OR "CAD CAM" OR sintering OR staining OR color OR shade OR sandblasting OR "airborne-particle abrasion" OR glazing OR polishing OR grinding OR aging OR fatigue OR thermocycling OR ltd OR "low temperature degradation" OR wear OR abrasion)	TS=(zirconia OR "zirconium dioxide" OR y-tzp) AND TS=(translucent OR "monolithic" OR "full anatomical" OR "full contour" OR cubic OR fsz OR 4y-tzp OR 5y-tzp) AND TS=("computer aided manufacturing" OR "CAD CAM" OR sintering OR staining OR colo$r OR shade OR sandblasting OR "airborne-particle abrasion" OR glazing OR polishing OR grinding OR aging OR fatigue OR thermocycling OR ltd OR "low temperature degradation" OR wear OR abrasion)
Field	All fields	Title, abstract, keywords	Title, abstract, keywords	Topic
Language	English	NA	English	English
Year			2010-2021	2010-2021
Type of publication, source			Article Source type: Journal	Article
Type of area, categories			Subject area: Materials Science, Dentistry, Engineering, Chemical Engineering, Chemistry, Medicine	Research areas: Materials science, Dentistry oral surgery medicine, Engineering, Chemistry, Science technology other topics, Physics, Biophysics, Optics, Electrochemistry, Mechanics, Crystallography, Microscopy, Research experimental medicine

		Web of Science categories: Dentistry oral surgery medicine, Materials science ceramics, Materials science multidisciplinary, Materials science biomaterials, Engineering biomedical, Optics
Exclusions	Keywords: Fuel cells, Solid oxide fuel cells Source title: Journal of Alloys and Compounds, Computer systems science and engineering, Carbon, Fuel, Integrated Ferroelectrics, Journal of power sources, Canadian Metallurgical Quarterly Catalysis communications, Catalysis Today, Chinese journal of aeronautics	Source title: Journal of alloys and compounds, Journal of nuclear materials, Journal of power sources, Carbon, Applied clay science Research areas: Metallurgy metallurgical engineering, Mining mineral processing, Construction building technology, Dermatology, Energy fuels

NA: Not available

Table S2. Risk of bias (quality) assessment tool.

Reference	
Reviewer	
Date	

Domain	Item	Yes	No	Unclear/ missing	Not applicable	Comments/details
Selection bias	Objectives: Was/were the objective/-s specific?					
	Study population: Were the materials clearly described?					
	Was the control group/-s relevant?					
	Sample size: Was the number of specimens included in the study clearly stated?					
	Was it clear how the sample size was determined (for example by power analysis, according to ISO standard)?					
	Were all groups (within the same test method) equal in sample size?					
	Were the specimens randomly allocated to groups and/or interventions?					
Assessment of selection bias		Low	High	Moderate		

Performance bias	Were the processing factors clearly described?					
	Were the processing steps performed in a standardized way?					
	Were the processing steps performed in a reproducible way?					
	Where applicable, were all groups treated equally?					

Were the specimens standardized?					
Assessment of performance bias	Low	High	Moderate		

Detection bias Were the methods clearly described and reproducible?					
Were standardized methods used?					
Were the outcomes pre-specified and defined?					
Was the statistical method suitable for the purpose?					
Were the statistical results appropriately interpreted?					
Was the significance level pre-defined?					
Assessment of detection bias	Low	High	Moderate		

Attrition bias If specimens were excluded: was the number clearly stated?					
If specimens were excluded: was the reason clearly stated?					
Was the dropout and the reason similar between the groups?*					
Was the dropout addressed appropriately?					
Assessment of attrition bias	Low	High	Moderate		

Report bias Were the results for each outcome reported and clearly described?					
Were results for each group and the estimated size of the effect and its precision reported?					
Were the results presented in a way that supported and related to the conclusion?					

Were potential confounding factors taken into account in the design and/or in analysis?					
Were sources of potential bias and limitations of the study addressed?					
Assessment of report bias	Low	High	Moderate		

Conflict of interest bias Were sources of funding or other support described?					
Have the authors declared that they lack financial or other interests that could affect the outcome?					
Assessment of conflict of interest bias	Low	High	Moderate		

Overall assessment of risk of bias	Low	High	Moderate

*If answer is No, consider if the dropout was addressed appropriately before automatically assessing the domain as High
The alternative *unclear* is used when the information is not possible to derive from the text.
The alternative *not applicable* is used when the question is not relevant.

Domain	**Low / Moderate / High**
Selection bias	
Performance bias	
Detection bias	
Attrition bias	
Report bias	
Conflict of interest bias	
Overall risk of bias	

Criteria for assessment of domains
Low risk of bias: All applicable items are assessed to be at low risk of bias (assessed as yes), or items assessed as moderate (unclear), in a way that does not substantially lowers confidence in the result.
Moderate risk of bias: Multiple applicable items are assessed as moderate (unclear), or one as high risk (no) in a way that substantially lowers confidence in the result.
High risk of bias: At least one applicable item is assessed as high risk (no), or multiple items assessed as moderate (unclear) in a way that substantially lowers confidence in the result.

Overall risk of bias criteria

Low risk of bias: All domains are assessed to be at low risk of bias.

Moderate risk of bias: At least one domain is assessed as moderate, but no domain as high risk.

High risk of bias: At least one domain is assessed as high risk, or at least four domains as moderate.

Table S3. Reasons for exclusion for publications

Reason for exclusion
Unclear zirconia type
1. Alghazzawi TF, Lemons J, Liu PR, Essig ME, Bartolucci AA, Janowski GM. Influence of low-temperature environmental exposure on the mechanical properties and structural stability of dental zirconia. *J. Prosthodont.* **2012**,21(5),363-9.
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3. Attachoo S, Juntavee N. Role of sintered temperature and sintering time on spectral translucence of nano-crystal monolithic zirconia. *J. Clin. Exp. Dent.* **2019**,*11*,e146-e153.
4. Beuer F, Stimmelmayr M, Gueth JF, Edelhoff D, Naumann M. In vitro performance of full-contour zirconia single crowns. *Dent. Mater.* **2012**,*28*,449-56.
5. Choi JW, Bae IH, Noh TH, Ju SW, Lee TK, Ahn JS, et al. Wear of primary teeth caused by opposed all-ceramic or stainless steel crowns. *J. Adv. Prosthodont.* **2016**,*8*,43-52.
6. Chougule KJ, Wadkar AP. An In vitro Comparative Evaluation of Flexural Strength of Monolithic Zirconia after Surface Alteration Utilising Two Different Techniques. *J. Clin. Diagn. Res*. **2017**,*11*,ZC20-ZC23.
7. Cui X, Shen Z, Wang X. Esthetic appearances of anatomic contour zirconia crowns made by additive wet deposition and subtractive dry milling, A self-controlled clinical trial. *J. Prosthet. Dent.* **2020**,*123*,442-448.
8. Ebeid K, Wille S, Hamdy A, Salah T, El-Etreby A, Kern M. Effect of changes in sintering parameters on monolithic translucent zirconia. *Dent. Mater.* **2014**,*30*,e419-24.
9. Bandeira MB, Queiroz IMS, Fernandes SKSC, Freitas A, Özcan M, Martinelli AE, Queiroz JRC. Evaluation of surface roughness of monolithic zirconia after using different polishing kits. *Pesqui. Bras. Odontopediatria Clin. Integr.* **2017**,17(1),e2984.
10. Giti R, Hojati SA. Effect of Varying Thickness and Number of Coloring Liquid Applications on the Color of Anatomic Contour Monolithic Zirconia Ceramics. *J. Dent. (Shiraz).* **2018**,*19*,311-319.
11. Gwon B, Bae EB, Lee JJ, Cho WT, Bae HY, Choi JW, et al. Wear Characteristics of Dental Ceramic CAD/CAM Materials Opposing Various Dental Composite Resins. *Materials (Basel).* **2019**,*12*,1839.
12. Hartkamp O, Lohbauer U, Reich S. Antagonist wear by polished zirconia crowns. *Int. J. Comput. Dent*. **2017**,20(3),263-274.
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15. Kelesi M, Kontonasaki E, Kantiranis N, Papadopoulou L, Zorba T, Paraskevopoulos KM, et al. The effect of different aging protocols on the flexural strength and phase transformations of two monolithic zirconia ceramics. *J. Appl. Biomater. Funct. Mater.* **2020**,*18*,2280800020982677.
16. Kim HK, Kim SH. Effect of the number of coloring liquid applications on the optical properties of monolithic zirconia. *Dent. Mater.* **2014**,*30*,e229-37.
17. Kim HK, Kim SH. Comparison of the optical properties of pre-colored dental monolithic zirconia ceramics sintered in a conventional furnace versus a microwave oven. *J. Adv. Prosthodont.* **2017**,*9*,394-401.
18. Kim HK, Kim SH, Lee JB, Ha SR. Effects of surface treatments on the translucency, opalescence, and surface texture of dental monolithic zirconia ceramics. *J. Prosthet. Dent.* **2016**,*115*,773-9.

19. Kim HK, Kim SH, Lee JB, Han JS, Yeo IS. Effect of polishing and glazing on the color and spectral distribution of monolithic zirconia. *J. Adv. Prosthodont.* **2013**,*5*,296-304.
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21. Kim SH, Choi YS. Changes in properties of monolithic and conventional zirconia during aging process. *Mech. Mater.* **2019**,*138* 103159.
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23. Lee WF, Feng SW, Lu YJ, Wu HJ, Peng PW. Effects of two surface finishes on the color of cemented and colored anatomic-contour zirconia crowns. *J. Prosthet. Dent.* **2016**,*116*,264-8.
24. Guilardi LF, Soares P, Werner A, de Jager N, Pereira GKR, Kleverlaan CJ, Rippe MP, Valandro LF. Fatigue performance of distinct CAD/CAM dental ceramics. *J. Mech. Behav. Biomed. Mater.* **2020**,*103*,103540.
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27. Nam JY, Park MG. Effects of aqueous and acid-based coloring liquids on the hardness of zirconia restorations. *J. Prosthet. Dent.* **2017**,*117*,662-668.
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33. Elshiyab SH, Nawafleh N, Walsh L, George R. Fracture resistance and survival of implant-supported, zirconia-based hybrid-abutment crowns, Influence of aging and crown structure. *J. Investig. Clin. Dent.* **2018**,*9*,e12355
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Experimental method

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