Aging Methods in Flexural Strength Testing of Lithium Disilicate: A Comprehensive Review

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INTRODUCTION:

In Dentistry, the longevity and flexural strength of ceramic materials are crucial factors in the long term. This study aims to review and synthesize updated information on different types of aging methods and which provides the most clinically relevant insights regarding the longevity of Lithium Disilicate ceramics when posteriorly submitted to flexural strenght testing.

METHODS:

PICO was designated according to the research question "How do different aging methods impact the flexural strength of lithium disilicate, and what are the clinical implications for material longevity?".
The database used was PubMed.

P Lithium disilicate ceramics
I Aging methods
C Different aging methods
O Flexural strength, material longevity

RESULTS:

References	Study Method	Sample Size	Aging Method	Findings
[1]	Fatigue failure load, cycles to fatigue failure, translucency and surface roughness	ALD, LD, LS and 4Y-PSZ discs	Cyclic loading	ALD exhibits an aesthetic appeal and moderate resistance, making it the best candidate for monolithic restorations
[2]	Examined for failures (racking, chipping, or catastrophic fractures)	54 lithium disilicate crowns were cemented onto a dentin analog and divided into three groups: OG, GA and AP	Cyclic fatigue testing	The surface finishing techniques had no significant impact on the success rates of lithium disilicate restorations, and polishing positively influenced the survival rate
[3]	Wear resistance and fracture resistance	Two types of lithium disilicate glass ceramics: glazed and polished fully crystallized and glazed partially crystallized	Thermodynamic fatigue	Glazed fully crystallized LDS demonstrated better wear resistance, however, glazing did not significantly affect fracture resistance
[4]	Fatigue failure load	30 ceramic discs divided into 2 groups: CTRL and GR	Staircase test and step-stress test	Internal surface grinding negatively influences the fatigue resistance of simplified lithium disilicate restorations
[5]	Single load-to-failure	72 samples of monolithic LDS ISSC divided into 3 groups: Ti-CAD, Ti-P and Ti-Cust	Cyclic mechanical loading and thermocycling	All groups are durable under physiological chewing forces, maintaining high survival probability. Fatigue decreased the caracteristic strength on Ti-Cust
[6]	Bond failure analysis, retention force testing and surface roughness	60 Ti-bases with lithium dissilicate crowns divided into 4 groups: NoT, 30-SiO-AlO, 50-AlO and 110-SiO-AlO	Thermomechanical aging	The use of 50-AlO provied the most stable bonded interface

OBJECTIVES:

1.To examine and condense studies that evaluate several aging methods, identifying those that yield the most clinically relevant insights concerning the longevity of Lithium Disilicate ceramics when subsequently subjected to flexural strength testing.

2.To discern evidence gaps and steer future research on this topic.

KEYWORDS:

Lithium Disilicate
Aging
Thermal Cycling
Fatigue Testing
Flexural Strength
Fracture Resistance
Longevity
Clinical Performance

✓ INCLUSION CRITERIA	EXCLUSION CRITERIA ✗
English articles	Non English articles
Published since 2019	Published before 2019
Primary Sources of information	Secondary sources of information
Q1 and Q2 articles	

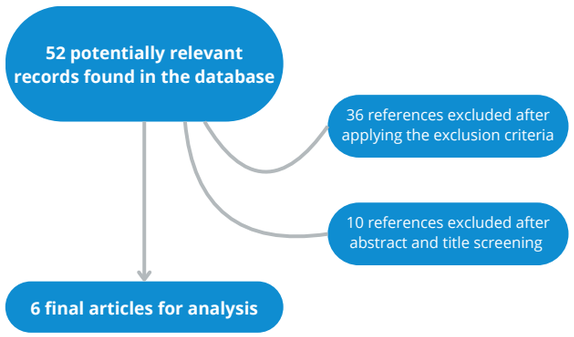

Figure 1- Flowchart of the Scientific Article Review Process.

CONCLUSION:

A review of recent studies on the flexural strength of lithium disilicate reveals diverse aging methods and highlights the need of developing methodologies to better simulate oral degradation. This work supports future research aimed at developing vigorous aging techniques to more accurately predict the ceramic's long-term clinical performance.

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