
Comparison Of The Clinical Longevity Of Lithium Disilicate Crowns In Fixed Dental Prostheses

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Abstract

Tooth loss can impair mastication, phonetics, aesthetics, and quality of life, necessitating restorations that restore function and maintain long-term clinical performance. Fixed dental prostheses (FDPs) made of lithium disilicate are increasingly used because of their favorable mechanical and aesthetic properties. However, evidence regarding the durability and longevity of lithium disilicate restorations varies according to material type, clinical conditions, and evaluation parameters. This literature review aimed to examine the clinical longevity of lithium disilicate crowns used in fixed dental prostheses based on survival rate, success rate, mechanical strength, wear resistance, marginal adaptation, bond strength, and restoration-related complications. A literature review was conducted using a systematic approach based on the PRISMA 2020 guidelines. Literature searches were performed in PubMed, ScienceDirect, DOAJ, MDPI, Garuda, and Google Scholar for articles published between 2020 and 2025. Five studies were included in the review. The findings demonstrated that lithium disilicate exhibited favorable flexural strength and wear resistance, with good mechanical stability following chewing simulation. Marginal adaptation remained within clinically acceptable limits, while bond strength and translucency supported restoration performance. Clinical studies also reported high survival and success rates over six years. In conclusion, lithium disilicate demonstrates favorable clinical longevity as a restorative material for fixed dental prostheses, offering a balance between mechanical durability, long-term clinical performance, and aesthetic outcomes.

Keywords: Fixed Dental Prosthesis; Lithium Disilicate; Longevity; Survival Rate; Success Rate

INTRODUCTION

Tooth loss is one of the oral health problems that can impair mastication, phonetics, aesthetics, and patients' quality of life. To restore these functions and aesthetic aspects, fixed dental prostheses (FDPs) remain one of the commonly used treatment options (AlMashaan & Aldakheel, 2022). This treatment offers several advantages, including greater comfort compared with removable dental prostheses, improved masticatory function, and enhanced aesthetics because the restoration is permanently attached to the abutment teeth. In addition, FDPs can distribute occlusal forces more evenly, thereby contributing to the maintenance of overall stomatognathic function (Bhagat et al., 2025).

The clinical success of a fixed dental prosthesis (FDP) is influenced by various factors, including the condition of the abutment teeth, restoration design, tooth preparation technique, cementation method, and type of restorative material used (Alenezi & Aloqayli, 2023). An FDP is a fixed prosthodontic restoration used to replace one or more missing teeth by connecting the abutment teeth through retainers and pontics, thereby restoring mastication, phonetics, and aesthetics. The restorative material used for FDPs must be capable of withstanding repetitive masticatory forces over an extended period without undergoing structural damage. Furthermore, the material should demonstrate resistance to temperature fluctuations, moisture, and the chemical conditions of the oral cavity that may affect restoration stability. Therefore, appropriate selection of the restorative material is one of the primary factors determining the success and service life of an FDP (Abdulrahman et al., 2021).

During intraoral use, FDP materials are required to possess high mechanical strength, particularly the ability to withstand the repetitive stresses and masticatory loads generated during oral function (Surlari et al., 2020). Adequate strength is necessary to minimize

mechanical complications, such as fracture, chipping, cracking, and other forms of restoration failure. In addition to mechanical strength, the material should possess adequate fatigue resistance because restorations are subjected to repeated loading over extended periods (Ferrini et al., 2023). The ability of a material to maintain structural integrity and clinical function over time is closely associated with restoration longevity, which can be assessed through survival rate, success rate, failure rate, and the duration of service before repair or replacement is required. Therefore, the evaluation of FDP materials should not be based solely on their initial mechanical strength but also on their ability to maintain restoration function and stability under clinical conditions over the long term (Mds & Jensen, 2023).

For many years, porcelain-fused-to-metal (PFM) restorations have been regarded as the gold standard for fixed dental prostheses because of their favorable mechanical strength and high clinical success rates. However, increasing patient demands for aesthetic outcomes have driven the development of metal-free restorative materials. Modern ceramic materials have become increasingly popular because they can provide color, translucency, and light reflection that more closely resemble natural tooth structure than metal-based restorations. In addition, the use of metal-free materials can minimize aesthetic problems commonly associated with PFM restorations, such as the appearance of a grayish line at the gingival margin resulting from the underlying metal framework (Fitria et al., 2022). Advances in dental material technology have led to the development of various ceramic materials that offer improved combinations of aesthetic and mechanical properties compared with conventional materials. One of the materials currently widely used is lithium disilicate glass-ceramic. This material exhibits tooth-like translucency, good biocompatibility, and high mechanical strength, making it a suitable restorative option for aesthetic restorations, including single crowns and fixed dental prostheses (Tekin & Hayran, 2020).

Lithium disilicate consists of lithium disilicate crystals distributed within a glass matrix, which contributes to improved flexural strength and fracture resistance. Various studies have reported that this material has a flexural strength of approximately 360–500 MPa, which is higher than that of conventional feldspathic ceramics. These characteristics allow lithium disilicate to be used in restorations requiring a combination of favourable aesthetics and durability. In clinical practice, the longevity of crowns used in fixed dental prostheses (FDPs) is an important indicator of restoration success. Longevity not only reflects the ability of the material to withstand mechanical loading but also indicates the ability of the restoration to maintain its function and integrity in the oral cavity over a specific period without failure requiring repair or replacement. In clinical evaluation, survival generally refers to a restoration that remains in place and functional in the oral cavity, either with or without complications, whereas success refers to a restoration that remains functional without complications or alterations requiring intervention (Suci et al., 2023). The clinical longevity of a restoration is not determined solely by the properties of the material but is also influenced by factors such as connector design, location of the restored teeth, quality of abutment tooth preparation, fabrication technique, and cementation method. These factors may affect stress distribution, fracture occurrence, loss of retention, and biological complications throughout the service life of the restoration (D'Addazio et al., 2020).

Although lithium disilicate has been extensively investigated and has demonstrated favourable mechanical and aesthetic characteristics, there remains a gap in understanding its clinical longevity when used as a component of FDPs. Some studies have evaluated the performance of this material through mechanical parameters and clinical outcomes; however, evidence regarding the medium- and long-term performance of lithium disilicate FDPs remains limited. A systematic review and meta-analysis by Saravi et al. (2021) indicated that clinical evidence regarding CAD/CAM ceramic-based FDPs, including

lithium disilicate, still requires prospective studies with longer observation periods to strengthen the available evidence. In addition, a systematic review of lithium disilicate prostheses reported a relatively wide range of survival rates, approximately 48.6–100%, and found that three-unit FDPs had lower survival rates than single-crown restorations at 5- and 10-year follow-up periods. The review also emphasized the limited availability of comparative studies capable of providing robust conclusions regarding the long-term performance of lithium disilicate compared with other materials, such as porcelain-fused-to-metal (PFM) and zirconia (Alshiddi, 2023).

This gap has become increasingly important because long-term studies have demonstrated that the longevity of lithium disilicate FDPs may decline substantially with increasing service time. In a study with a 10-year follow-up, three-unit FDPs made of monolithic lithium disilicate demonstrated a survival rate of 87.9% and a success rate of 69.8%. However, at a follow-up of up to 15 years, the survival rate decreased to 48.6% and the success rate to 30.9%, indicating that long-term restoration performance cannot be predicted solely from the material's initial mechanical strength. These findings highlight the need for a more comprehensive understanding of longevity, including failure patterns, types of complications, timing of failure, and clinical factors contributing to the long-term survival of lithium disilicate FDPs (Mazza et al., 2022).

This literature review was selected because research on lithium disilicate FDPs is distributed across studies with different research designs, observation periods, restoration sites, and outcome parameters. Previous systematic reviews and meta-analyses have combined survival and success data from zirconia- and lithium disilicate-based FDPs, but have also indicated that evidence regarding long-term performance remains insufficient, particularly from studies with extended follow-up periods. Furthermore, systematic reviews specifically addressing lithium disilicate restorations have demonstrated variability in survival outcomes and a limited number of comparative studies involving other restorative materials. These conditions indicate the need for a synthesis of the available literature to obtain a more integrated understanding of how long lithium disilicate FDPs can remain clinically functional, which factors influence their longevity, and which types of failures or complications occur most frequently (Hawthorn et al., 2024).

Based on this research gap, this literature review aimed to examine and analyse recent studies concerning the longevity or clinical durability of lithium disilicate FDPs, including survival rate, success rate, failure rate, patterns of complications or failures, and factors influencing the clinical longevity of the restorations. This literature review also discusses the advantages and limitations of lithium disilicate compared with other restorative materials, thereby providing a scientific basis for material selection and FDP treatment planning to support long-term success in prosthodontic treatment.

RESEARCH METHODS

This study employed a literature review method with a systematic approach to identify, evaluate, and synthesize scientific evidence regarding the longevity or clinical durability of lithium disilicate fixed dental prostheses (FDPs). The literature review process was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to enhance transparency in the identification, selection, and reporting of the articles included in the study. PRISMA 2020 was used as a reporting guideline, particularly to describe the literature search process, article screening, eligibility assessment, and determination of the studies ultimately included in the synthesis.

A systematic literature search was conducted using several electronic databases, including PubMed, ScienceDirect, Scopus, DOAJ, MDPI, Garuda, and Google Scholar. The

search strategy was developed based on the focus and objectives of the study using a combination of terms representing the restorative material, type of restoration, and clinical outcome parameters. The keywords included “lithium disilicate,” “lithium disilicate crown,” “lithium disilicate fixed dental prosthesis,” “fixed dental prosthesis,” “fixed partial denture,” “dental bridge,” “survival rate,” “clinical performance,” “longevity,” and “fracture resistance.” Boolean operators AND and OR were applied to establish relationships among the search terms and broaden the retrieval of articles relevant to the research topic.

The search strategy consisted of three main components: lithium disilicate as the restorative material, the type of restoration being investigated, and parameters describing restoration longevity and performance. One of the search formulations used was “lithium disilicate” AND (“fixed dental prosthesis” OR “fixed partial denture” OR “dental bridge”) AND (“longevity” OR “survival rate” OR “clinical performance” OR “fracture resistance”). The search formulation was adapted according to the indexing system and search features of each database. The search was limited to publications published between 2020 and 2025. This publication period was selected to focus the review on recent developments and scientific evidence concerning the use of lithium disilicate, including advances in fabrication technology, clinical outcomes, and the ability of restorations to remain functional over time.

Before the screening process, predefined eligibility criteria were established to determine which articles were suitable for analysis. Studies were considered eligible if they were primary research studies, systematic reviews, or meta-analyses; evaluated lithium disilicate as a dental restorative material, particularly in FDPs or other restorations relevant to FDPs; and reported at least one parameter related to longevity, survival rate, success rate, failure rate, clinical performance, fracture, chipping, or restorative complications. In addition, the articles had to be written in English, available as full-text publications, and published between 2020 and 2025.

Articles were excluded if they did not address the use of lithium disilicate as a restorative material. Studies that only evaluated material characteristics without relating them to restoration performance, clinical outcomes, or durability were also excluded. Individual case reports and case series that did not provide information on restoration performance relevant to the objectives of the study were excluded. Other publication types that were not considered included editorials, letters to the editor, commentaries, and opinion articles. Articles for which the full text could not be obtained, as well as duplicate publications identified across multiple databases, were also excluded from the selection process.

Article selection was performed sequentially according to the PRISMA 2020 framework. The process consisted of four stages: identification, screening, eligibility, and inclusion. During the initial stage, all publications retrieved through the search strategies from PubMed, ScienceDirect, Scopus, DOAJ, MDPI, Garuda, and Google Scholar were compiled into a single dataset. The retrieved records were then examined for potential duplicates resulting from the same article being indexed in more than one database. Duplicate records were removed before proceeding to the screening stage.

Initial screening was conducted by reviewing the titles and abstracts of each article. Publications that did not demonstrate relevance to lithium disilicate, FDPs, restoration longevity, survival rates, or clinical performance were excluded from further assessment. Articles that remained potentially relevant were subsequently assessed through full-text review. During this stage, the content of each article was evaluated against all predefined inclusion and exclusion criteria. Articles that were found to be inconsistent with the eligibility criteria after full-text assessment were excluded, and the reasons for exclusion were documented.

Publications that fulfilled all eligibility criteria were included in the review and used as data sources for the study. The number of articles was documented at each stage of the selection process to ensure that the screening procedure could be clearly traced. The recorded data included the number of publications identified through the initial search, the number of records remaining after duplicate removal, the number of articles eligible based on title and abstract screening, the number of full-text articles assessed, the number of publications excluded with the corresponding reasons, and the final number of articles included in the review. The entire selection process was subsequently presented in a PRISMA flow diagram, as shown in Figure 1.

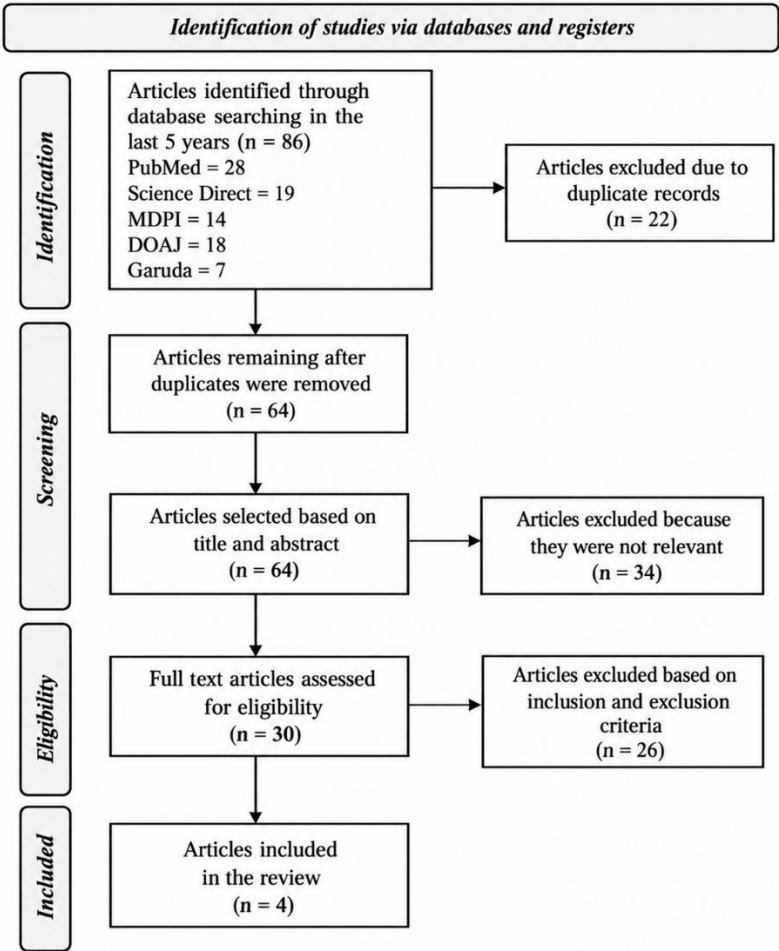


Figure 1. PRISMA flow diagram

RESULTS AND DISCUSSION

No	Author and Year of Publication	Title	Research Findings
1	Alsulimani et al. (2025)	<i>The Effect of Chewing Simulation on Flexural Strength of Different Lithium disilicate Ceramics</i>	Based on the findings of the study, a statistically significant difference was observed in the flexural strength values between the two tested lithium disilicate ceramic brands, IPS e.max CAD LT and Initial Lisi LT/B1, both before and after chewing simulation ($p < 0.05$). The IPS e.max CAD LT group demonstrated substantially higher flexural strength values than the Initial Lisi LT/B1 group, ranging from 307.2 to 310.5 MPa, whereas the Initial Lisi LT/B1 group exhibited values ranging from 148.1 to 158.5 MPa. Chewing simulation for 240,000 cycles did not result in a statistically significant change in the flexural strength of either material. These findings indicate that IPS e.max CAD LT exhibits superior mechanical resistance and a greater ability to maintain its flexural strength compared with Initial Lisi LT/B1, suggesting its potential suitability as a material for restorations requiring high resistance to long-term masticatory loading.
2	Killedar et al. (2025)	<i>Wear Resistance and Surface Roughness of Hybrid Ceramic Crowns Compared to Lithium Disilicate: An In Vitro Study</i>	Based on the findings of the study, crowns fabricated from hybrid ceramic and lithium disilicate demonstrated comparable wear resistance following simulated masticatory loading, with no statistically significant difference observed between the two groups ($p > 0.05$). The volume loss was $0.036 \pm 0.005 \text{ mm}^3$ for hybrid ceramic and $0.029 \pm 0.004 \text{ mm}^3$ for lithium disilicate. Nevertheless, both materials exhibited a statistically significant increase in surface roughness following chewing simulation ($p < 0.05$). Hybrid ceramic demonstrated a higher surface roughness value ($1.45 \pm 0.12 \text{ }\mu\text{m}$) than lithium disilicate ($1.28 \pm 0.15 \text{ }\mu\text{m}$). These findings suggest that although

			both materials exhibit comparable wear resistance, lithium disilicate tends to maintain a smoother surface following exposure to masticatory loading. This characteristic may contribute to reduced plaque retention and support the long-term clinical performance of the restoration.
3	Ferrini et al. (2023)	<i>SEM Evaluation of the Marginal Accuracy of Zirconia, Lithium Disilicate, and Composite Single Crowns Created by CAD/CAM Method: Comparative Analysis of Different Materials</i>	Based on the findings of the study, statistically significant differences were observed in the marginal gap values among crowns fabricated from zirconia, composite, and lithium disilicate ($p < 0.05$). Zirconia demonstrated the lowest marginal gap value ($21.45 \pm 12.58 \mu\text{m}$), followed by composite ($44.7 \pm 24.96 \mu\text{m}$) and lithium disilicate ($62.28 \pm 51.8 \mu\text{m}$). These findings indicate that zirconia provides superior marginal adaptation compared with the other two materials. Nevertheless, all evaluated materials exhibited marginal gap values below the clinically acceptable threshold of $120 \mu\text{m}$. Therefore, zirconia, composite, and lithium disilicate fabricated using CAD/CAM technology demonstrated adequate marginal adaptation for use in fixed prosthodontic rehabilitation.
4	Aziz & El-mowafy (2023)	<i>Six-year clinical performance of lithium disilicate glass-ceramic CAD-CAM versus metal-ceramic crowns</i>	Based on the findings of the study, CAD/CAM lithium disilicate glass-ceramic (LDGC) crowns demonstrated favorable clinical performance compared with metal-ceramic (MC) crowns over a six-year observation period. A total of 12 complications were reported in the metal-ceramic crown group, comprising 9 esthetic complications, 2 technical complications, and 1 biological complication. In contrast, the CAD/CAM lithium disilicate group experienced only 2 complications, consisting of 1 technical complication and 1 esthetic complication. The cumulative six-year survival rate of CAD/CAM lithium disilicate crowns was 96%, compared with

			90.8% for metal-ceramic crowns. Similarly, the success rate of CAD/CAM lithium disilicate crowns was 96%, compared with 83.4% for metal-ceramic crowns. From an esthetic perspective, the majority of patients reported greater satisfaction with the appearance of CAD/CAM lithium disilicate crowns than with metal-ceramic crowns.
5	Srivastava & Kumar (2025)	<i>In vitro evaluation of shear bond strength and translucency of zirconia-reinforced lithium silicate and lithium disilicate</i>	Based on the findings of the study, lithium disilicate (LD) demonstrated superior performance compared with zirconia-reinforced lithium silicate (ZLS) in terms of shear bond strength and esthetic properties. The mean shear bond strength of lithium disilicate was 22.4 ± 2.5 MPa, which was significantly higher than that of ZLS (15.8 ± 2.1 MPa; $p < 0.05$). These findings indicate that lithium disilicate provides stronger adhesive bonding, which may contribute to improved retention and long-term restorative performance. In addition, lithium disilicate exhibited greater translucency, with a contrast ratio of 0.42 ± 0.03 , compared with 0.55 ± 0.04 for ZLS ($p < 0.05$). The higher translucency of lithium disilicate may enable restorations to more closely mimic the optical characteristics of natural teeth, thereby providing favorable esthetic outcomes.

Table 1. Results of the analysis of the articles

The longevity of jacket crowns used in fixed dental prostheses is one of the primary factors determining the long-term success of restorative treatment. The durability of these restorations is influenced by various factors, including the mechanical strength of the material, wear resistance, marginal adaptation, bond quality to tooth structure, and the ability to maintain esthetic properties throughout the service period (Aswal et al., 2023). Lithium disilicate demonstrates favorable performance across various parameters associated with clinical success and restorative longevity. These findings indicate that lithium disilicate is one of the modern ceramic materials capable of meeting both functional and esthetic demands in the rehabilitation of missing teeth using fixed dental prostheses (Liu et al., 2025).

The first important factor contributing to restorative longevity is flexural strength. A study comparing IPS e.max CAD LT and Initial Lisi LT/B1 demonstrated that IPS e.max CAD LT exhibited substantially higher flexural strength values, ranging from approximately 307.2–310.5 MPa, whereas Initial Lisi LT/B1 showed values ranging from 148.1–158.5

MPa. These findings indicate that not all lithium disilicate materials possess identical mechanical properties, as differences in composition, manufacturing processes, and microstructure may influence their resistance to masticatory loading. The higher flexural strength of IPS e.max CAD LT indicates a greater ability to withstand occlusal forces and reduce the risk of restorative fracture. Furthermore, chewing simulation for 240,000 cycles did not result in a significant reduction in flexural strength, indicating good mechanical stability during long-term use (Alsulimani et al., 2025).

The ability to maintain flexural strength following chewing simulation also indicates that lithium disilicate possesses good resistance to mechanical degradation that may occur during clinical use. In the oral cavity, restorations are exposed not only to masticatory forces but also to temperature fluctuations, moisture, and chemical conditions that may affect material properties over time. Therefore, the stability of flexural strength following chewing simulation serves as an indicator of the material's ability to maintain its performance under conditions that simulate the clinical environment. These findings support the use of lithium disilicate, particularly IPS e.max CAD LT, as a material with high durability and the potential to provide a favorable prognosis for jacket crowns and fixed dental prostheses (Sulastri, 2024).

In addition to flexural strength, wear resistance is another important parameter for evaluating the longevity of jacket crowns used in fixed dental prostheses. A study comparing lithium disilicate and hybrid ceramic demonstrated that the two materials exhibited relatively similar wear resistance, with no statistically significant difference between them. However, lithium disilicate showed lower volume loss ($0.029 \pm 0.004 \text{ mm}^3$) than hybrid ceramic ($0.036 \pm 0.005 \text{ mm}^3$). In addition, the surface roughness after masticatory simulation was lower for lithium disilicate ($1.28 \pm 0.15 \text{ }\mu\text{m}$) than for hybrid ceramic ($1.45 \pm 0.12 \text{ }\mu\text{m}$) (Killedar et al., 2025). These findings indicate that lithium disilicate may better maintain surface integrity following repeated masticatory loading. A smoother restorative surface is important for reducing plaque accumulation, minimizing the risk of periodontal inflammation, and maintaining the esthetic quality of restorations over the long term (Elsherbini et al., 2023).

The success of fixed restorations is also influenced by marginal adaptation, as a large marginal gap may increase the risk of microleakage, secondary caries, postoperative sensitivity, and restorative failure. Based on a study comparing zirconia, composite, and lithium disilicate, lithium disilicate exhibited a marginal gap of $62.28 \pm 51.8 \text{ }\mu\text{m}$. Although this value was greater than that of zirconia ($21.45 \pm 12.58 \text{ }\mu\text{m}$) and composite ($44.7 \pm 24.96 \text{ }\mu\text{m}$), it remained well below the clinically acceptable threshold of $120 \text{ }\mu\text{m}$ (Ferrini et al., 2023). These findings indicate that although lithium disilicate does not demonstrate the highest level of marginal adaptation among the materials evaluated, lithium disilicate restorations fabricated using CAD/CAM technology still exhibit adequate accuracy for use in fixed prosthodontic rehabilitation. Adequate marginal adaptation may contribute to increased restorative longevity by reducing the likelihood of bacterial infiltration and damage to the supporting tooth structure (Syed et al., 2026).

Regarding long-term clinical performance, a study comparing CAD/CAM lithium disilicate glass-ceramic (LDGC) crowns with metal-ceramic crowns demonstrated favorable outcomes. During the six-year observation period, the metal-ceramic group experienced 12 complications comprising esthetic, technical, and biological complications, whereas the lithium disilicate group experienced only two complications. Furthermore, lithium disilicate demonstrated a survival rate of 96% and a success rate of 96%, compared with 90.8% and 83.4%, respectively, for metal-ceramic crowns (Aziz & El-mowafy, 2023). The high success and survival rates observed in the lithium disilicate group indicate its ability to maintain restorative function with relatively few complications. From an esthetic perspective, patients

also showed greater preference for lithium disilicate restorations because of their more natural tooth-like appearance compared with metal-based restorations (Balet et al., 2026).

Another factor that contributes to restorative longevity is the bond strength between the restorative material and tooth structure. A study comparing lithium disilicate with zirconia-reinforced lithium silicate (ZLS) demonstrated that lithium disilicate exhibited a shear bond strength of 22.4 ± 2.5 MPa, which was higher than that of ZLS (15.8 ± 2.1 MPa) MPa (Srivastava & Kumar, 2025). High bond strength plays an important role in maintaining restorative retention and reducing the risk of debonding during clinical use. In addition, lithium disilicate exhibits favorable translucency, resulting in restorations with a more natural tooth-like appearance. The combination of strong adhesive performance and favorable optical properties makes lithium disilicate a suitable material for restorations requiring high esthetic demands, particularly in the anterior region (Al-Hamzi et al., 2025).

Overall, the findings from the five studies indicate that lithium disilicate possesses several characteristics that support the longevity of jacket crowns used in fixed dental prostheses. The material demonstrates high flexural strength, good wear resistance, marginal adaptation within clinically acceptable limits, high clinical success, as well as favorable bond strength and esthetic properties. Although certain parameters, such as marginal adaptation and specific mechanical properties, may be inferior to those of other materials such as zirconia, lithium disilicate provides a favorable balance between mechanical strength, esthetics, and clinical performance. Therefore, lithium disilicate represents an effective and reliable material for jacket crowns used in fixed dental prostheses, particularly in cases requiring an optimal combination of durability, function, and esthetics over the long term (Wierichs et al., 2024).

CONCLUSION

Based on the findings of this literature review, lithium disilicate demonstrates good durability as a material for jacket crowns used in fixed dental prostheses. The material exhibits high flexural strength, good wear resistance, marginal adaptation within clinically acceptable limits, as well as favorable bond strength and esthetic properties. In addition, lithium disilicate restorations demonstrate high clinical success and survival rates, with relatively low complication rates.

Overall, lithium disilicate is an effective and reliable material for fixed dental prostheses because it provides a favorable combination of mechanical strength, clinical durability, and esthetics. Therefore, it may serve as a suitable long-term restorative material, particularly in clinical situations requiring a balance between functional performance and esthetic outcomes.

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