



## Dentists' Preferences for Valplast versus Cobalt Chromium Removable Partial Dentures: A Cross-Sectional Survey in Derna and Al-Bayda, Libya

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### Abstract:

**Background:** Removable partial dentures (RPDs) remain a standard treatment for partially edentulous patients, with cobalt chromium (Co-Cr) frameworks historically regarded as the gold standard due to their strength, stability, and durability. However, flexible thermoplastic alternatives such as Valplast have gained increasing popularity, particularly in contexts where affordability and aesthetics strongly influence treatment decisions. The study was designed to investigate the reasons behind practitioners' preference for Valplast over cobalt chromium in two Libyan cities, addressing a gap in local evidence on material choice. **Aim:** The aim of the study was to evaluate the attitudes and awareness of dentists and dental technicians in Derna and Al-Bayda regarding the advantages, disadvantages, indications, and contraindications of Valplast and cobalt chromium RPDs. **Methods:** A descriptive cross-sectional survey design was adopted. A structured bilingual questionnaire containing 26 multiple-choice questions was distributed to 50 dentists and dental technicians, with 26 completed responses received (response rate 52%). The instrument explored participants' previous experience, perceptions of clinical handling, material properties, fabrication difficulty, longevity, stability, and reparability. Data were analysed using descriptive statistics and presented as frequencies and percentages. **Results:** Flexible dentures were reported as widely used either alone (39%, n=10) or alongside cobalt chromium (46%, n=12), while no participant reported exclusive use of cobalt chromium. Ease of handling was strongly associated with flexible dentures (84%, n=22), and 77% (n=20) considered them less time consuming. Cost was a key factor, with 81% (n=21) regarding flexible dentures as less expensive. In contrast, cobalt chromium was overwhelmingly associated with longevity (96%, n=25) and stability (88%, n=23). Biocompatibility was also favoured for cobalt chromium (65%, n=17), while flexible dentures were recognised for superior retention (73%, n=19). Regarding fabrication, 85% (n=22) identified cobalt chromium as more difficult to produce, reflecting laboratory and technical challenges.

**Conclusion:** The findings indicate that dentists in Derna and Al-Bayda prefer Valplast dentures for affordability, aesthetics, and ease of use, while cobalt chromium remains valued for longevity, reparability, and clinical performance in complex anatomical cases. Clinical decision-making in Libya is influenced by both material properties and socio-economic considerations, underlining the importance of balanced training and resource provision to support evidence-based prosthodontic practice.

**Keywords:** Removable partial dentures, Cobalt chromium, Valplast, Flexible dentures, Dentist preferences, Libya.

### Introduction

Removable partial dentures (RPDs) represent a key component in the rehabilitation of partially edentulous patients, restoring function, aesthetics, and oral health. An RPD is defined as a dental prosthesis that replaces one or more, but not all, missing teeth and associated structures, and is supported by natural teeth, implant-supported crowns, abutments, or mucosa (WebMD, 2023). Despite their clinical utility, the design and material composition of RPDs remain subjects of continuous development and debate, as each material offers distinctive advantages and limitations that influence their clinical adoption. Cobalt chromium (Co-Cr) frameworks have long been considered the conventional option for RPDs due to their strength, durability, and resistance to masticatory forces (Jamithedentist, 2021). The alloy was first developed in the early twentieth century by Elwood Haynes, who fused cobalt and chromium, later incorporating elements such as tungsten and molybdenum to enhance mechanical properties (Haynes, 1907). The biomedical applications of Co-Cr alloys expanded rapidly, and by the mid-twentieth century, they were used in medical implants, including prosthetic heart valves, demonstrating their

exceptional wear resistance (Tarzia et al., 2007). In dentistry, Co-Cr alloys provided a stable framework for RPDs, ensuring excellent retention and support when designed with careful surveying and mouth preparation (Hyslop et al., 2010). Their mechanical resilience, corrosion resistance, and biocompatibility further strengthened their reputation as the standard material for cast partial dentures (Keenan et al., 2003). The development of flexible partial dentures, however, has introduced alternative treatment modalities. First introduced in 1956 under the trade name Valplast in the United States, flexible dentures are fabricated from nylon-based thermoplastic materials, later diversified with products such as Flexiplast (Negrutiu et al., 2005). Their appeal lies in their lightweight, metal-free design, which is resistant to fracture, comfortable to wear, and highly aesthetic due to their translucency that blends with natural gingival tissues (Stern, 1964). Flexible dentures simplify design and eliminate the need for extensive tooth preparation or metal clasps, making them suitable for patients with aesthetic demands or allergies to conventional denture materials such as polymethyl methacrylate (PMMA) (Parvizi et al., 2004). Clinical research comparing flexible and Co-Cr dentures highlights trade-offs between the two. Studies have noted that nylon-based flexible RPDs provide greater patient satisfaction, particularly in aesthetics and comfort, although they may compromise function and stability (Bosinceanu et al., 2018; Kumar et al., 2021). In contrast, Co-Cr dentures, while more complex to fabricate and costlier, have been consistently shown to offer superior longevity, stability, and hygiene (Hundal et al., 2015). In Libyan contexts, a study by Elfaidy et al. (2022) demonstrated that clinicians' awareness and preference towards flexible dentures were increasing, despite limited formal education in dental schools on these materials. The continued evolution of dental prosthetic materials has created uncertainty in clinical decision-making. Dentists are tasked with balancing functional outcomes, patient satisfaction, cost, and long-term prognosis, which explains the significance of understanding practitioners' preferences between Co-Cr and Valplast RPDs. The introduction of flexible dentures has disrupted long-established reliance on metal frameworks, raising questions about durability, clinical appropriateness, and professional training.

**Aim and Objectives:** The aim of this study will be to investigate the attitudes and awareness of dentists in Derna and Albayda towards cobalt chromium and Valplast removable partial dentures, with specific reference to their advantages, disadvantages, indications, and contraindications. The study will seek to identify the reasons underpinning dentists' preferences, thereby contributing to an improved understanding of clinical decision-making in prosthodontic practice in Libya. The objectives of the study will be to examine the frequency and context in which cobalt chromium and flexible dentures are used; to assess dentists' perceptions of handling, aesthetics, cost-effectiveness, and longevity; to identify the extent to which formal training influences material choice; and to explore how socio-economic and patient-related factors shape professional recommendations.

**Significance of the Study:** The findings of this research will provide valuable insights into the clinical and professional considerations shaping prosthodontic practice in Libya. The study will offer evidence on how dentists in two key cities perceive and utilise cobalt chromium and Valplast dentures, allowing professional bodies and educational institutions to better understand emerging trends. By documenting the reasons behind clinical preferences, the research will guide efforts to align undergraduate and postgraduate curricula with contemporary material use, ensuring that future dentists are equipped with knowledge of both conventional and newer prosthetic options (Elfaidy et al., 2022).

The outcomes of this study will also have practical implications for patient care. Greater awareness of dentists' preferences and the rationale behind them will inform strategies for patient education and counselling, enabling individuals to make more informed decisions about treatment. In the longer term, the study will contribute to the evaluation of resource allocation in dental services, particularly in contexts where cost and accessibility remain pressing concerns. By highlighting the interplay between material innovation, clinical practice, and patient expectations, the research will serve as a reference point for future investigations into the adaptation of prosthodontic practices within the Libyan healthcare system.

## Methodology

### Research Design:

The study adopted a descriptive cross-sectional survey design, appropriate for exploring professional attitudes and preferences at a single point in time (Creswell, 2014). Cross-sectional designs are particularly effective when the objective is to capture current practices and perceptions across a defined population, without the intention to establish causality (Bryman, 2016). This design was selected to enable the systematic collection of data on dentists' preferences for flexible (Valplast) and cobalt chromium removable partial dentures and to assess the underlying reasons shaping these choices. By using a structured questionnaire distributed to practitioners in two

Libyan cities, the study sought to provide a comprehensive snapshot of knowledge, attitudes, and decision-making processes in prosthodontic practice.

**Participants and Sampling:** The target population comprised dentists, dental specialists, and dental technicians practising in Derna and Al-Bayda. These cities were selected as representative urban centres in eastern Libya with active dental services. A purposive sampling strategy was employed to ensure that participants had relevant professional experience with removable partial dentures, aligning with Bryman's (2016) emphasis on selecting respondents who can provide meaningful insights into the research problem. In total, 50 questionnaires were distributed, of which 26 were completed and returned, yielding a response rate of 52 per cent. The sample included a mixture of general practitioners and specialists, reflecting the diversity of practitioners responsible for treatment planning and denture fabrication. Although the sample size was modest, it was considered sufficient for descriptive purposes, consistent with methodological recommendations for exploratory studies where the emphasis is on depth of insight rather than statistical generalisability (Creswell & Creswell, 2018).

**Data Collection and Instrument:** Data were collected using a structured questionnaire written in both Arabic and English to maximise accessibility. The instrument consisted of 26 multiple-choice questions, divided into sections addressing experience, material preference, clinical handling, aesthetics, biomechanical properties, and repairability. Questions were designed with categorical response options, such as "Flexible denture," "Cobalt chrome denture," and "Yes/No," enabling straightforward coding for analysis. The bilingual format ensured clarity of understanding among respondents, reducing the risk of misinterpretation. Self-administration of the questionnaire allowed participants to complete it independently, minimising interviewer bias (Dillman et al., 2014).

**Validity and Reliability:** The content validity of the questionnaire was established by basing items on previously published studies comparing denture materials (Hundal et al., 2015; Kumar et al., 2021; Bosinceanu et al., 2018). Expert review by two senior dental academics further ensured that the items adequately reflected the constructs of interest, namely functionality, aesthetics, cost, and professional training. Reliability was addressed by ensuring standardisation of the questionnaire and by piloting the instrument with three practising dentists prior to the main survey. Feedback from the pilot informed minor revisions to improve wording and clarity, which enhanced internal consistency. Consistency of response options also reduced ambiguity, contributing to reliability in subsequent data coding and analysis (Bryman, 2016).

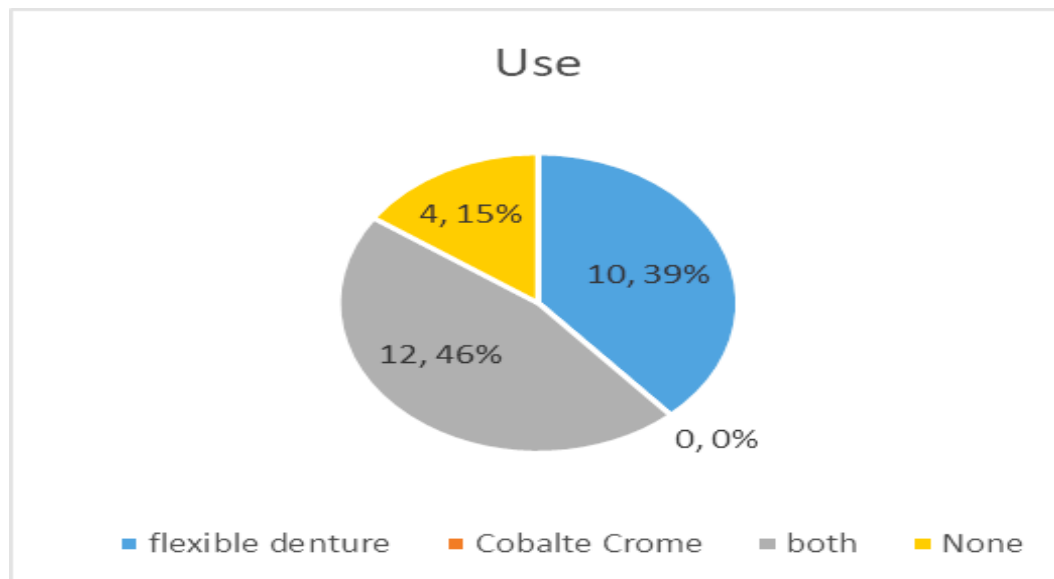
**Data Analysis:** Returned questionnaires were checked for completeness before data entry. Responses were coded numerically and analysed using descriptive statistics, including frequencies and percentages, to summarise the distribution of preferences across categories. Comparative analysis was conducted to identify trends between flexible and cobalt chromium dentures in relation to ease of handling, aesthetics, stability, longevity, and cost-effectiveness. This quantitative approach allowed for the systematic identification of professional attitudes without requiring inferential statistical testing, given the exploratory nature of the study and the modest sample size (Creswell, 2014). Visual representation of results through tables and figures supported the interpretation of findings.

**Ethical Considerations:** Ethical principles were observed in the conduct of the study. Participation was voluntary, and informed consent was obtained from all respondents. Anonymity and confidentiality were assured, with no identifying information recorded on the questionnaires. Respondents were informed that their answers would be used solely for research purposes. The design of the questionnaire also avoided sensitive or intrusive questions, thereby respecting the professional role of participants. Ethical rigour in research involving human respondents is critical to ensuring trustworthiness, credibility, and respect for autonomy (Bryman, 2016).

**Findings: Demographic Characteristics:** A total of 26 responses were received from dentists and dental technicians working in Derna and Al-Bayda. Participants represented a mixture of general dental practitioners, prosthodontic specialists, and laboratory-based dental technicians, ensuring coverage of both the clinical and technical perspectives of removable partial denture provision. Most respondents had several years of professional

practice, and both public and private sector dentists were represented in the sample. This diversity provided a suitable basis for evaluating attitudes towards cobalt chromium and flexible removable partial dentures.

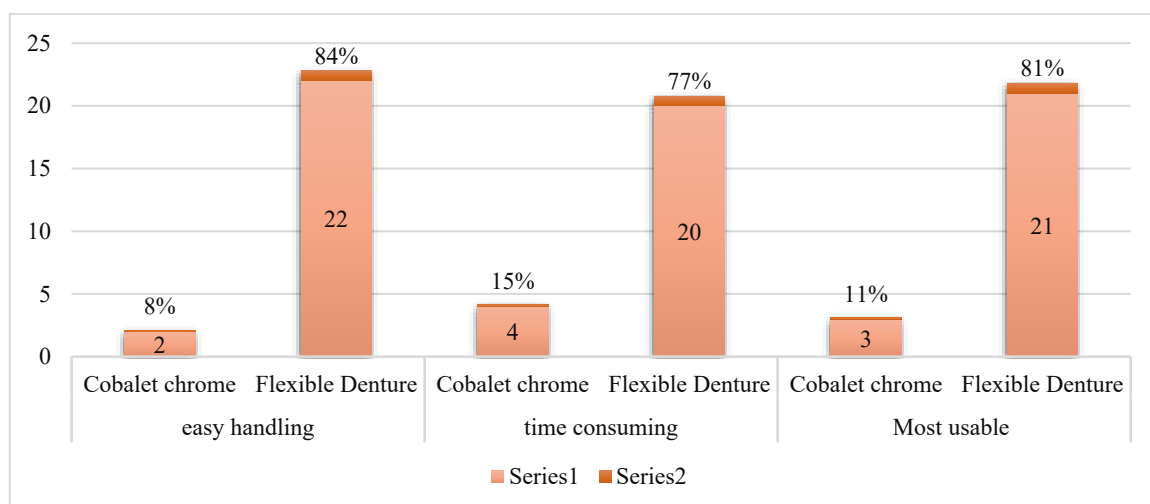
### Previous Experience with RPD Materials



**Figure 1:** Reported Use of Removable Partial Denture Materials

Figure 1 shows the distribution of respondents according to their experience with removable partial denture (RPD) materials. The majority of participants (46 per cent, n=12) reported using both cobalt chromium and flexible dentures in their practice. A further 39 per cent (n=10) reported exclusive use of flexible dentures, while 15 per cent (n=4) indicated that they did not use either type. No respondent reported exclusive use of cobalt chromium dentures. These results suggest that flexible dentures dominate clinical practice, either alone or in combination with cobalt chromium frameworks.

### Clinical Handling and Usability

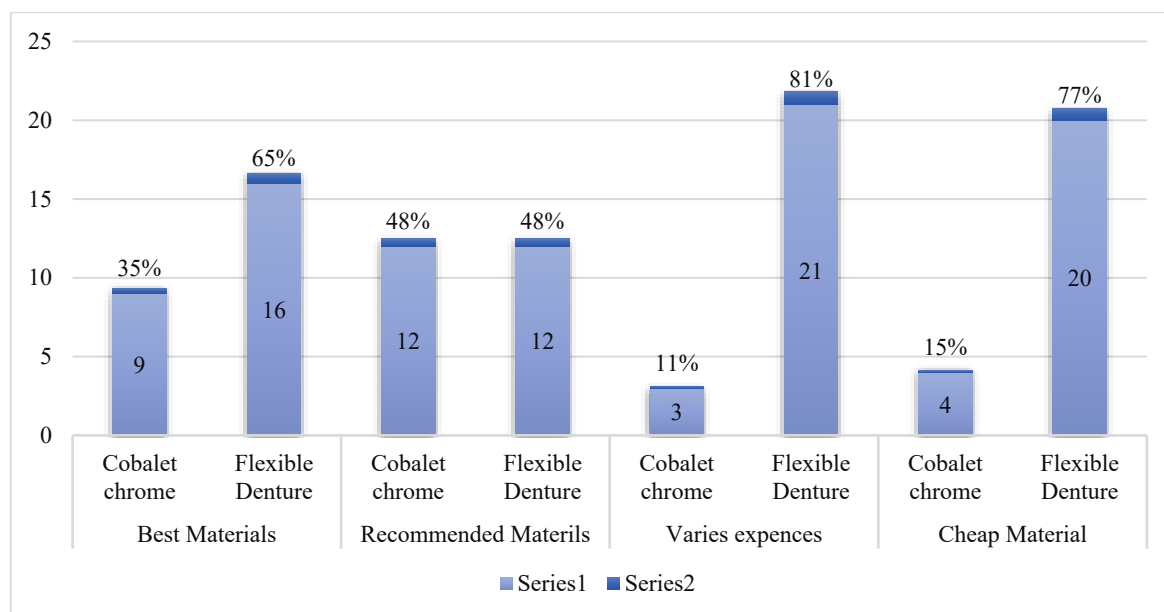


**Figure 2:** Perceptions of Handling and Usability of RPD Materials

Figure 2 presents respondents' perceptions of the practical handling of flexible and cobalt chromium dentures. Flexible dentures were overwhelmingly reported as easier to handle (84 per cent, n=22) compared with cobalt chromium (8 per cent, n=2). Similarly, 77 per cent (n=20) of participants considered flexible dentures to be less time consuming, while only 15 per cent (n=4) selected cobalt chromium. When asked which material was most

usable, 81 per cent (n=21) selected flexible dentures, compared with 11 per cent (n=3) for cobalt chromium. These findings reflect a strong preference for flexible dentures in terms of efficiency and ease of clinical application.

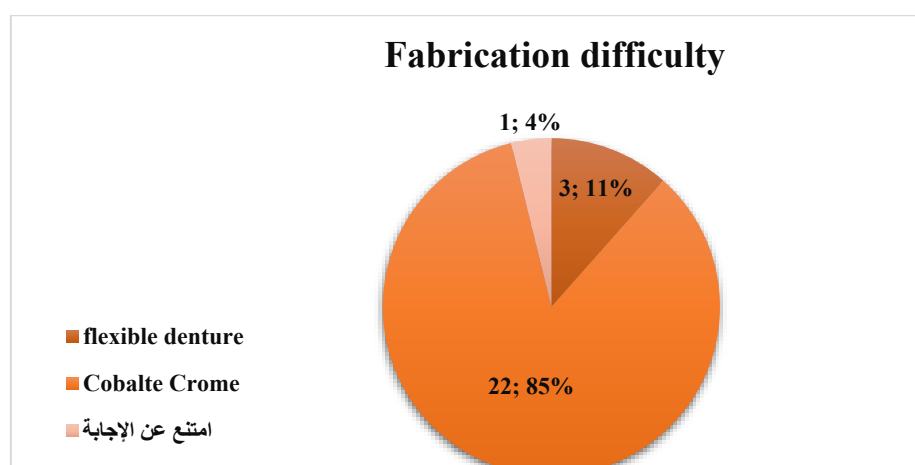
### Opinions on Material Properties



**Figure 3: Dentists' Opinions on the Properties of RPD Materials**

Figure 3 illustrates participants' opinions on which material was considered best overall, most recommended to patients, and most affordable. Flexible dentures were considered the best material by 65 per cent (n=16) compared with 35 per cent (n=9) who favoured cobalt chromium. Recommendations to patients were equally divided, with 48 per cent (n=12) endorsing cobalt chromium and 48 per cent (n=12) endorsing flexible dentures. Regarding affordability, a large majority (81 per cent, n=21) identified flexible dentures as less expensive, compared with 11 per cent (n=3) for cobalt chromium. Similarly, 77 per cent (n=20) regarded flexible dentures as cheaper overall, whereas only 15 per cent (n=4) selected cobalt chromium. These findings highlight the strong influence of cost and accessibility in shaping preferences, even though both materials retained value in clinical recommendations.

### Fabrication Difficulty

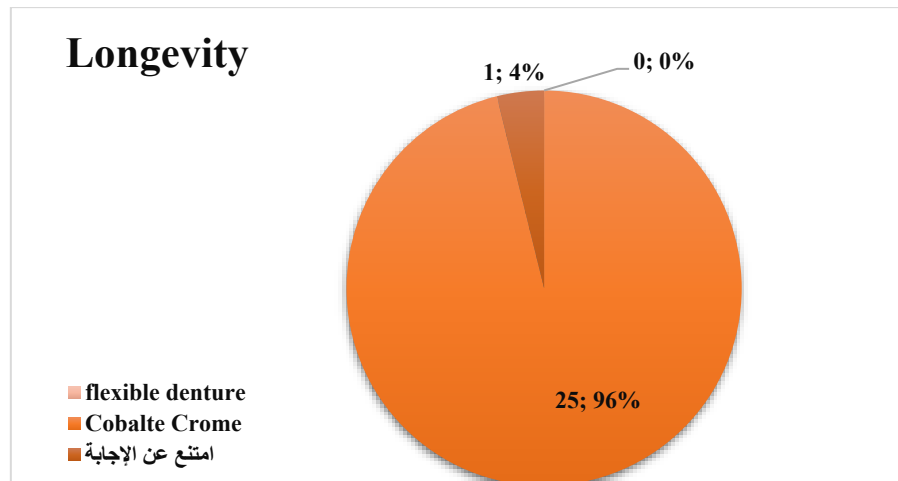


**Figure 4: Respondents' Perceptions of Fabrication Difficulty**

The responses presented in Figure 4 show that cobalt chromium dentures were overwhelmingly perceived as the more difficult material to fabricate. A large majority (85 per cent, n=22) selected cobalt chromium as difficult to manufacture compared with only 11 per cent (n=3) who identified flexible dentures. One respondent (4 per cent) chose not to answer. The findings reflect the greater technical complexity involved in designing and casting cobalt

chromium frameworks, which require surveying, mouth preparation, and laboratory precision in producing metal components. In contrast, flexible dentures rely on thermoplastic injection-moulding, which many practitioners view as more straightforward and less time consuming. The high proportion identifying cobalt chromium as difficult to fabricate highlights why practitioners in resource-limited settings such as Libya may prefer flexible alternatives, as fabrication time and required technical expertise can significantly impact clinical adoption.

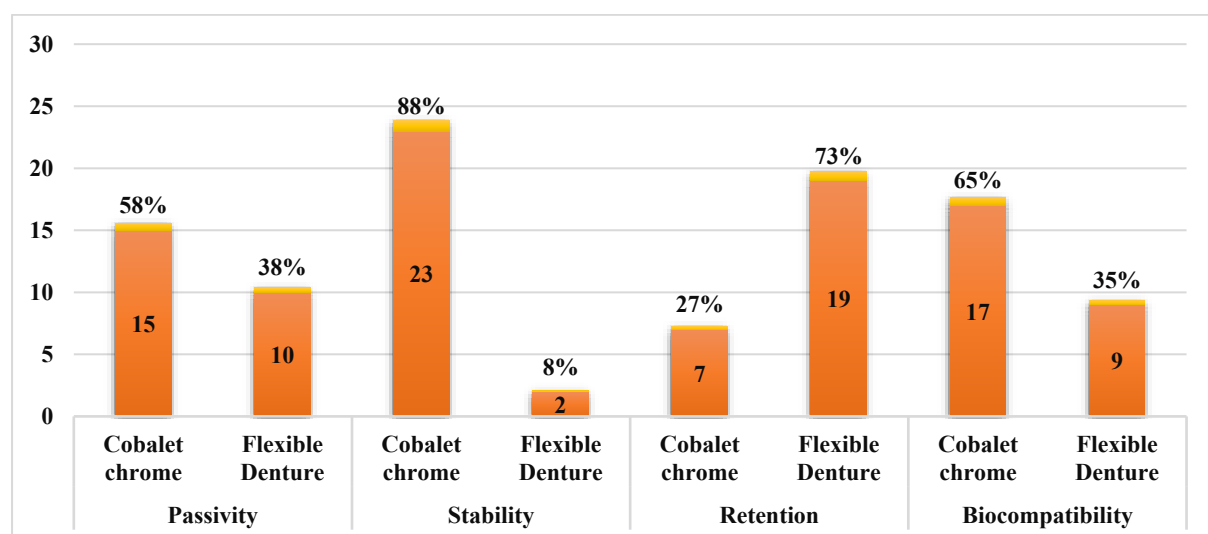
### Longevity



**Figure 5:** Respondents' Views on the Longevity of Denture Materials

Figure 5 demonstrates that cobalt chromium dentures were overwhelmingly considered to have superior longevity. Almost all respondents (96 per cent, n=25) selected cobalt chromium as the longer-lasting option compared with flexible dentures, which received no selections. Only one participant (4 per cent) did not answer. These responses highlight the recognition among practitioners that cobalt chromium frameworks offer greater durability and resistance to wear compared with thermoplastic alternatives. The findings align with existing literature suggesting that cobalt chromium alloys resist fracture, corrosion, and long-term deformation (Hundal et al., 2015). In contrast, flexible dentures were not identified as a long-lasting solution, likely due to limitations in repairability and susceptibility to distortion over time. This perception of longevity contributes to the continued role of cobalt chromium dentures despite the popularity of flexible options for their aesthetics and comfort.

### Passivity, Stability, Retention, and Biocompatibility

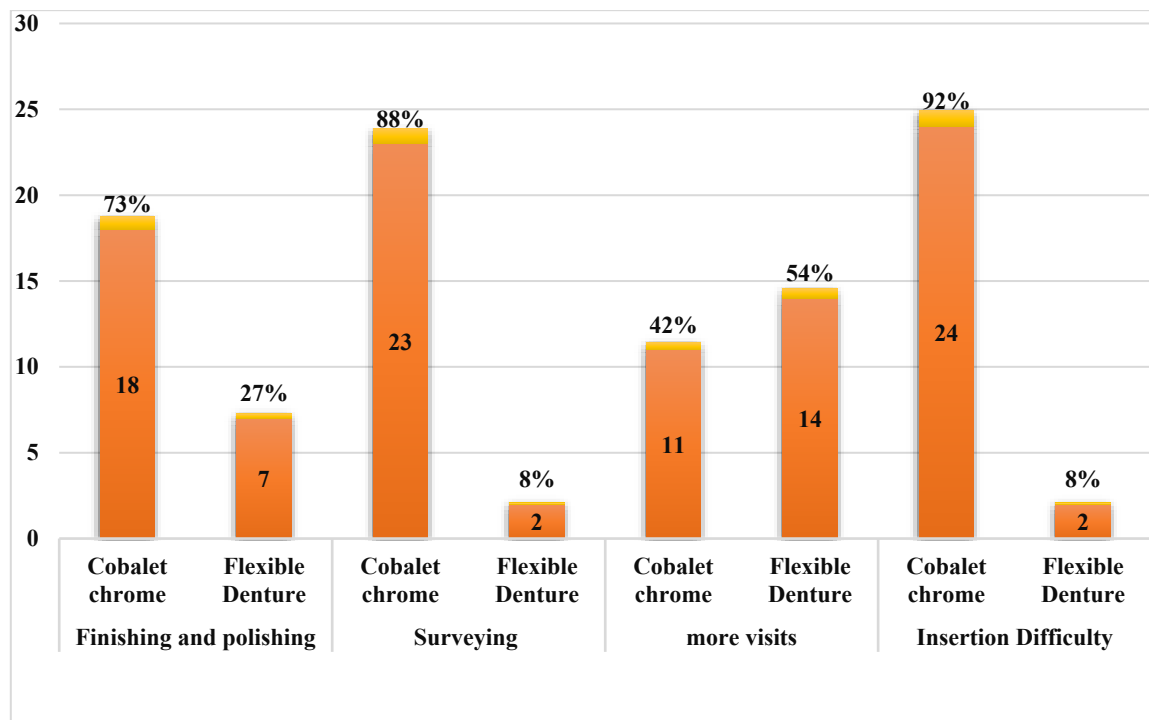


**Figure 6:** Respondents' Perceptions of Clinical Properties of Denture Materials

As shown in Figure 6, cobalt chromium was strongly favoured in terms of passivity, stability, and biocompatibility, while flexible dentures were preferred for retention. More than half of respondents (58 per cent,

n=15) considered cobalt chromium more passive compared with 38 per cent (n=10) for flexible dentures. Stability was dominated by cobalt chromium, with 88 per cent (n=23) choosing this option, while only 8 per cent (n=2) favoured flexible dentures. In contrast, retention was seen as a key strength of flexible dentures, with 73 per cent (n=19) supporting this option against 27 per cent (n=7) for cobalt chromium. For biocompatibility, 65 per cent (n=17) identified cobalt chromium as superior, while 35 per cent (n=9) selected flexible dentures. These responses highlight the contrasting strengths of the two materials: cobalt chromium was consistently perceived as offering structural stability and compatibility with oral tissues, while flexible dentures were recognised for superior retention qualities, likely linked to their adaptability to gingival tissues.

### Finishing, Surveying, and Insertion

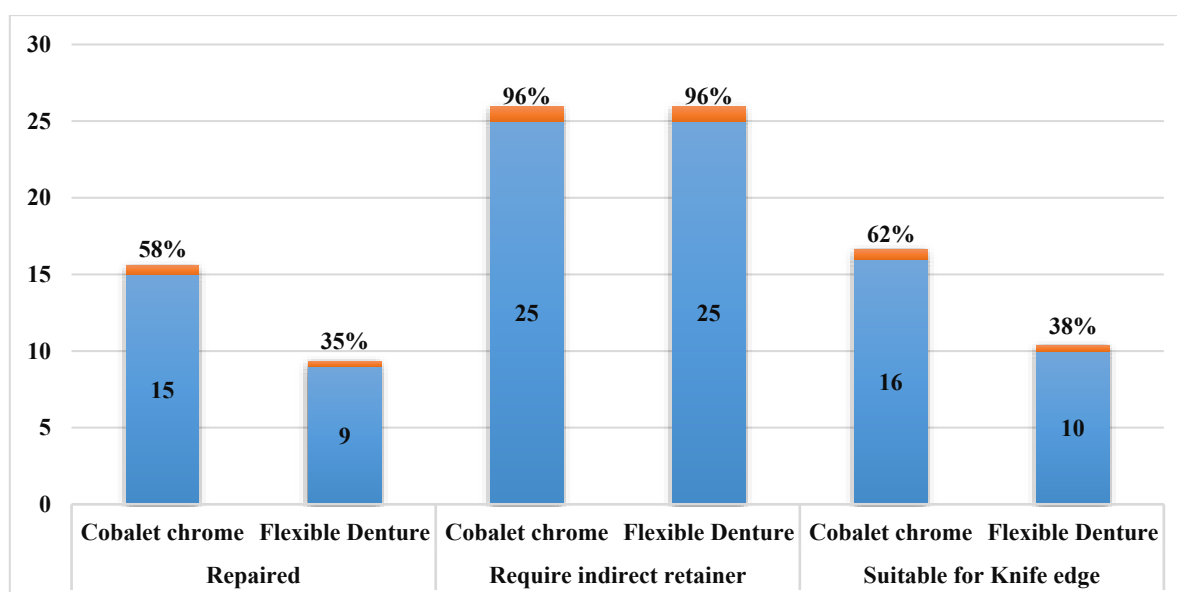


**Figure 7:** Respondents' Perceptions of Finishing, Surveying, and Insertion Requirements

The findings presented in Figure 7 show that cobalt chromium dentures were consistently viewed as requiring more demanding clinical and laboratory processes. For finishing and polishing, 73 per cent (n=18) selected cobalt chromium compared with 27 per cent (n=7) for flexible dentures. Surveying was even more strongly associated with cobalt chromium, with 88 per cent (n=23) identifying it as necessary, compared with 8 per cent (n=2) for flexible dentures. Insertion was also seen as more difficult with cobalt chromium, selected by 92 per cent (n=24) of respondents, while only 8 per cent (n=2) chose flexible dentures. Interestingly, responses regarding the number of clinical visits showed that 54 per cent (n=14) considered flexible dentures to require more visits, compared with 42 per cent (n=11) for cobalt chromium. These findings suggest that while cobalt chromium presents

technical demands during fabrication and insertion, flexible dentures may require ongoing adjustments during the follow-up phase.

### Repair, Indirect Retainers, and Suitability for Knife-Edge Ridges



**Figure 8:** Respondents' Perceptions of Repair, Retainers, and Knife-Edge Suitability

Figure 8 summarises responses regarding repairability, the requirement for indirect retainers, and suitability for knife-edge ridges. For repairability, 58 per cent (n=15) believed cobalt chromium dentures could be repaired compared with 35 per cent (n=9) for flexible dentures. Indirect retainers were identified as necessary for both materials, with 96 per cent (n=25) selecting this option for cobalt chromium and an equal 96 per cent (n=25) selecting flexible dentures, reflecting recognition of their functional importance regardless of material. Suitability for knife-edge ridges showed a preference for cobalt chromium, chosen by 62 per cent (n=16) compared with 38 per cent (n=10) for flexible dentures. These findings suggest that while both materials are perceived as requiring indirect retainers, cobalt chromium is viewed as more reliable in structurally compromised ridges, whereas flexible dentures remain less repairable, limiting their long-term adaptability.

### Discussion

The study examined dentists' and dental technicians' perceptions in Derna and Al-Bayda regarding the use of cobalt chromium and flexible removable partial dentures, drawing on data from 26 respondents through a descriptive cross-sectional design. Participants included general practitioners, prosthodontic specialists, and laboratory technicians, thereby representing diverse clinical and technical experiences. The overall findings demonstrate a preference for flexible dentures in terms of cost, usability, and aesthetics, while cobalt chromium was associated with longevity, stability, and performance in more complex restorative cases. The key finding highlighted that flexible dentures were more widely used either alone or alongside cobalt chromium, while none of the respondents reported exclusive reliance on cobalt chromium. Similar patterns were noted by Elfaidy et al. (2022), who observed that flexible dentures were increasingly incorporated into Libyan practice despite not being formally taught at university level. Comparable observations have also been made internationally, where nylon-based prostheses have been gradually adopted due to their aesthetic qualities and adaptability (Bosinceanu et al., 2018). The findings illustrate that clinical practice may be driven by convenience and patient demand rather than formalised training, suggesting that cobalt chromium frameworks are now reserved for selective cases. The study reveals that flexible dentures were perceived as easier to handle, less time consuming, and more usable than cobalt chromium. These findings are consistent with Kumar et al. (2021), who reported higher patient satisfaction with flexible dentures due to their comfort and adaptability, although their mechanical properties were inferior. Hundal et al. (2015) similarly noted that cobalt chromium dentures demanded extensive tooth preparation and technical input, which increased clinical workload. The results clarify that efficiency is a dominant factor influencing clinical choice, particularly in contexts where time and resources are constrained. It is therefore probable that practical considerations strongly favour the adoption of flexible dentures in day-to-day practice. The evidence indicates that affordability played a central role in shaping preferences, with flexible dentures consistently regarded as the cheaper and more accessible option. This aligns with findings by Bosinceanu et al. (2018), who

demonstrated that nylon-based prostheses significantly reduced production costs by eliminating the need for a metal framework. Elfaidy et al. (2022) also reported that cost considerations were crucial for both clinicians and patients in Libya, where economic limitations influence treatment acceptance. The results clarify that financial constraints may override long-term clinical considerations, leading to wider adoption of flexible dentures even when cobalt chromium is mechanically superior. The findings illustrate that cobalt chromium dentures were overwhelmingly described as more difficult to fabricate compared with flexible dentures. Similar findings were reported by Hundal et al. (2015), who highlighted the laboratory complexity and technical expertise required to produce cobalt chromium frameworks. Negrutiu et al. (2005) also confirmed that thermoplastic resins could be processed more easily using injection moulding techniques, reducing technical challenges. The study reveals that limitations in laboratory infrastructure and training may increase the perceived burden of producing cobalt chromium dentures in the Libyan context, which could explain the reliance on flexible alternatives in routine clinical settings. The results clarify that cobalt chromium dentures were strongly associated with superior longevity. Comparable findings were reported by Kumar et al. (2021), who showed that cobalt chromium frameworks provided better stress distribution and durability over time, and by Hundal et al. (2015), who noted their high resistance to fracture and deformation. In contrast, Parvizi et al. (2004) emphasised that flexible dentures were more difficult to repair and prone to deformation. The evidence indicates that cobalt chromium remains valued for long-term rehabilitations, even though flexible dentures are preferred for short-term or aesthetically driven cases. The study reveals that cobalt chromium was considered more passive, stable, and biocompatible, whereas flexible dentures were rated more favourably in terms of retention. Hundal et al. (2015) reached similar conclusions, observing that cobalt chromium frameworks provide superior stability and compatibility, while flexible dentures adapt more effectively to gingival tissues. Kumar et al. (2021) also observed that flexible dentures performed well in patients with compromised periodontal conditions, while cobalt chromium was advantageous in ridges requiring structural reinforcement. The findings illustrate that dentists recognise the distinct advantages of each material, and material selection is likely determined by clinical case characteristics rather than a single dominant preference. The evidence indicates that cobalt chromium dentures were described as requiring more demanding finishing, surveying, and insertion procedures. This was consistent with Bosinceanu et al. (2018), who observed that metal frameworks were technically complex and required precision at every stage. Interestingly, flexible dentures were associated with the need for more follow-up visits, a finding that contrasts with Kumar et al. (2021), who reported similar maintenance requirements across both materials. It is possible that differences in laboratory standards or patient compliance in the Libyan context contribute to the need for adjustments when flexible dentures are prescribed. The results clarify that although flexible dentures reduce initial technical complexity, they may not always lessen the long-term clinical workload. The study reveals that cobalt chromium dentures were more frequently regarded as repairable, more suitable for knife-edge ridges, and equally reliant on indirect retainers when compared with flexible dentures. Bosinceanu et al. (2018) similarly reported that cobalt chromium frameworks were more resilient in complex anatomical conditions, while Kumar et al. (2021) highlighted their ability to provide superior biomechanical function. The findings illustrate that despite the widespread preference for flexible dentures, cobalt chromium retains a significant role in cases requiring durability, repairability, and structural reliability. The results clarify that dentists and technicians in Derna and Al-Bayda continue to weigh the trade-offs between the two materials, with flexible dentures preferred for affordability and usability, while cobalt chromium is chosen when long-term outcomes and complex conditions demand stronger performance. The evidence indicates that educational, economic, and clinical factors intersect in shaping professional practice, and material choice appears influenced as much by contextual constraints as by biomechanical properties.

### **Strengths and Limitations (≈250 words)**

A notable strength of this study lies in its focus on an under-researched professional context in Libya, where evidence on dentists' perceptions of removable partial denture materials remains limited. By targeting two cities, Derna and Al-Bayda, and incorporating both clinicians and technicians, the study achieved diversity in perspectives and professional backgrounds. The use of a structured bilingual questionnaire also enhanced accessibility for participants, reducing language-related barriers and improving response accuracy. Furthermore, the study's descriptive cross-sectional design allowed for a clear snapshot of current professional attitudes, providing a valuable foundation for further exploration. Nevertheless, certain limitations should be acknowledged. The modest sample size of 26 respondents restricts the generalisability of the findings beyond the surveyed locations. A larger and more geographically dispersed sample may have provided greater representativeness. The reliance on self-reported data introduces the possibility of response bias, as participants may have provided socially desirable answers rather than fully reflecting their practice. The study also focused on practitioners' perspectives without including patient views, which are critical in evaluating satisfaction and treatment uptake. In addition, the descriptive statistical analysis provided useful frequencies but did not allow for deeper inferential testing, which could have identified associations between professional background and material preference. Limited validation of the questionnaire outside of a small pilot also constrains the strength of conclusions. Despite

these limitations, the study contributes new insights into clinical attitudes and highlights important directions for further research.

### **Theoretical and Practical Implications**

The findings contribute theoretically by reinforcing the distinction between material choice based on biomechanical function and choice influenced by socio-economic and practical considerations. Previous literature has highlighted the superiority of cobalt chromium in longevity and stability (Hundal et al., 2015; Kumar et al., 2021), while nylon-based systems gained recognition for aesthetics and affordability (Bosinceanu et al., 2018). The study adds to this theoretical framework by showing that practitioners in Libya selectively value different attributes, suggesting that professional decisions are shaped not only by material properties but also by clinical efficiency and economic context. This supports models of professional decision-making where contextual constraints intersect with technical knowledge, underscoring the need for more nuanced frameworks in prosthodontics.

Practically, the results indicate that dentists in Libya are likely to continue recommending flexible dentures due to their affordability and ease of fabrication, especially in resource-limited clinical settings. However, cobalt chromium frameworks remain indispensable in cases requiring long-term durability, repairability, and suitability for anatomically compromised ridges. Dental education programmes may need to address the gap in formal training on flexible dentures, ensuring that practitioners gain balanced exposure to both materials. For health policy, the findings imply that cost remains a critical determinant of treatment provision, suggesting that strategies to reduce the expense of cobalt chromium dentures could improve their uptake. The study also highlights the importance of laboratory capacity, as limited technical infrastructure continues to shape practitioners' choices. These practical considerations may guide both curriculum reform and clinical practice guidelines in Libya.

### **Recommendations for Future Study**

Future research should adopt a larger sample size across multiple Libyan cities to improve representativeness and strengthen generalisability. Comparative studies including both private and public healthcare settings would provide deeper insights into the impact of institutional context on material choice. The inclusion of patient perspectives would add valuable data on satisfaction, cost acceptability, and long-term experience, allowing for a more comprehensive evaluation of removable partial denture provision. Employing mixed-method designs, combining quantitative surveys with qualitative interviews, could further illuminate the underlying reasons behind practitioners' preferences. In addition, longitudinal studies are recommended to track clinical outcomes over time and to validate whether perceptions of longevity and repairability align with actual patient experiences. Investigations into dental curricula and postgraduate training in Libya would also help to clarify the educational gap surrounding flexible dentures. Such studies would provide evidence for curriculum development and guide improvements in clinical training and practice.

### **Conclusion**

The study demonstrates that dentists and dental technicians in Derna and Al-Bayda show a marked preference for flexible removable partial dentures due to ease of handling, affordability, and aesthetic outcomes, while cobalt chromium dentures are valued for longevity, stability, and repairability. Flexible dentures are perceived as practical for routine clinical use, whereas cobalt chromium frameworks retain importance in complex cases requiring structural reliability. The evidence indicates that material choice in Libya is influenced as much by economic and educational factors as by biomechanical properties. Practitioners acknowledge the distinct advantages of both systems, reflecting context-specific decision-making shaped by patient needs, technical infrastructure, and financial constraints. The study therefore highlights the dual role of flexible and cobalt chromium dentures in contemporary Libyan practice. Insights generated from this research will continue to inform clinical training, patient education, and health policy, ensuring more balanced and effective decision-making in prosthodontic treatment provision.

### **Acknowledgement**

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