Trends in Prosthodontics - A Review

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Abstract

Prosthodontics is concerned with the impact of tooth or tissue damage and partial or complete loss of teeth on oral function in its broadest sense. It deals with this largely through prosthetic replacement. The discipline occupies a major portion of a dental school curriculum, and dental practitioners usually devote much of their practice to prosthodontic services. It is continuously evolving consequent to the rapid advancements in dental biomaterials science, clinical and laboratory techniques and technologies, education, research, therapeutics, literature, and interdisciplinary developments. While the basic process of making dentures has changed little over the past several decades, new materials and techniques can help laboratories and clinicians provide functional, esthetic restorations that offer exceptional value to patients. Implant treatment is a tremendous adjunct to removable prosthodontics in the treatment of edentulous patients, but it is not within the financial reach of all dental patients.In future, prosthodontics has a very good scope and it is going to be beneficial for the patients who are edentulous.Technology developments are very much needed in future for its very well establishments .This review is aimed to discover some fascinating facts about the trends that are prevailing in prosthodontics and its future scope.

Keywords *: prosthodontics;trends;developments;future education; research.*

Introduction

Prosthodontics is a well defined and broad dental specialty catering to a wide range of oral rehabilitative treatment needs of the community. Prosthodontics has continuously evolved as a result of progress in biomaterial science,laboratory technology, multidisciplinary advancements and clinical techniques [1]. In the past several years, prosthodontics has begun to establish itself as a "knowledge-based" speciality, and not just a "skill-based" specialty. This change will be the key foundation in our ability to prosper. Emerging concepts, materials, and technologies impact the education, research, and practice of prosthodontics [2]. Many paradigm shifts and watershed events have signaled the end of historical boundaries in the dental profession such as osseointegration, internet, and tissue-engineering [3]. The future prospects of our discipline can be examined and understood only in the context of current trends and prospects [4].

Several other authors like Carlson , et al ,2006 , [5] have described in his study that the main focus in prosthodontics is that it has shifted from removable prosthesis to fixed dentures . implant-supported restorations have attracted intense interest in the dental community.Even authors like Kumar CP , et al , 2016 [6] have described in his overview about the enormous advancements that took place in various disciplines that's related to Prosthodontics .

True need can only be identified in a dialogue between the professional and the patient.Dental status and income , but not age, place of residence, nor concern for dental appearance, influence desire for implant

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treatment at the end of the studied 10-year period. There is no objective need in prosthodontic treatment. Manifests need and demand change over time, and are influenced by the patients' attitude and situation, and by the dentist's practice profile [7].

The aim of this review is to explore some detailed information regarding the Trends in prosthodontics .

Materials and Method

This research was conceived as a scoping literature review. First we sought existing reviews in the last decade that had assessed the all the possibilities of trends in prosthodontics.We did not follow a systematic review or meta – analysis .In seeking to identify relevant literature from the last 20 years , we accessed databases that are commonly used to index general dental health including pubmed , google scholar [8–13] , Searches of the reference list from the relevant review article were also employed to identify further relevant studies .Search terms included 'prosthodontics ' ; ' trends ' ; 'development ' ; ' future education ' ; ' research ' . Considered research was limited to titles that's related to prosthodontics , computer – aided manufacturing in prosthodontics , trends in removable prosthodontics , future value of prosthodontics and all other articles that were related to any other categories were excluded . The level of evidence of the reviewed articles were categorized as per the criteria of Centre for Evidence - Based Medicine , Oxford ,UK [14]

Number of articles selected : 33

Number of articles with similarity : 27

Number of articles with known concept : 7

Number of articles with recent advances : 8

RECENT HISTORY AND CURRENT TRENDS

Any kind of prognostication needs to be based on cur-rent realities. As far as they are known, these are complex. Prosthodontics has evolved from many years of clinical experience, into what may be considered to be an expense-related hierarchy of prosthodontic treatment options .

Threats to the integrity of the dentition have been through the application of prosthodontic solutions in the belief that a loss of arch intactness would result in a reduction in oral health and function. Such a therapeutic rationale gave rise to the '28-tooth syndrome', which dictated the need for complete dental arches, i.e. 28 teeth, 14 in each arch [15] . Regardless of earlier attempts at implants, [16] it was the principle of osseointegration that launched the intensive development of implants in dentistry in 1965, which has since revolutionized the treatment of edentulous patients [17 18] .

Management Trends

A central goal of prosthodontics is to stabilize the occlusion and restore oral function, an approach that has enjoyed success due to the wide range of treatment possibilities available for oral rehabilitation [5] ,so it has to be in control. Cost as a constraint for treatment is evident from a global perspective of poverty, but a reality also in the wealthiest countries, where many people cannot afford high-cost dental treatment [19] .A modified application of digital dentistry is the quantification of the effect of the proposed treatment prior to the active treatment phase. This takes advantage of the software precision in measurements and quantification. On the 3D models, volumes and distances can be precisely measured , and in the dental practice, analysis of tooth preparation can occur prior to prosthesis fabrication [20].

EVIDENCE OF THE VALUE OF PROSTHODONTICS

Prosthetic rehabilitation is done to regain function , esthetics and speech [21]. Evidence based clinical care has recently been widely discussed in the context of both medicine and dentistry .Evidence based care is defined as the provision of treatment based on a combination of the highest quality relevant research findings , the clinicians skills , and the patients particular needs . The quality and quantity of relevant research are not always are not always sufficient, however [4]. Modern prosthodontics can affect the most wonderful solutions through oral rehabilitation, but prosthodontists are in danger of letting their advanced technology block out their vision of humanistic priorities. The international prosthodontic community should provide guidance into ways and means of helping the disadvantaged achieve an improved quality of life [6].

CLINICAL IMPLICATION

The clinical skills required to deliver excellent complete denture care are also paramount to successful implant prosthodontics (fixed and removable) and esthetic dentistry. The most common gums disease are gingivitis and periodontitis , [22] . Acrylic resin denture can affect the periodontal structures of a tooth [23]. Marginal discrepancy severely affects the long term success of All ceramic complete veneer crowns [24] and ceramic restorations [25] .In cement retained restorations , there are numerous advantages for cement-retained prosthesis over screw-retained prosthesis such as passive casting, axial loading, accessibility, progressive loading, etc [26]. Even so, the opportunities to develop these skills and the interest appear to be decreasing at the same time that the need is projected to increase. In service to our patients, the profession must examine this trend closely [27]. The use of silicone maxillofacial elastomers are advantageous because it provides a wide range of customization, light weight, life-like appearance, ease of intrinsic and extrinsic coloring, non-allergenic, tissue compatibility, ease of construction and dimensionally stability [28]. The basic techniques used in all ceramic fabrications include powdered liquid glass base system, pressable glass base system, and computer-aided design/ computer-aided manufacturing (CAD/CAM) system [29].

PROSTHODONTICS : A PAST WITH FUTURE

As one of the oldest dental specialties, prosthodontics has a long history of innovation and adaptability. This overview of the field presents landmarks in the development of prosthodontics from mediaeval times to the present and speculates on some future trends [1] . Currently, dentists have a reasonable way to deliver an important health service to the population at large. However, only with a rapid advancement in the concept of delivery of total prosthodontic care can the best interests of the public be maintained [30] . Projections of future prosthodontics needs [31] show that the number of bridges needed by the elderly will increase 2.0 times and the number of dentures needed by 1.5 times over the next 20 years , then reach a plateau in the subsequent 10 years .

Results and Discussion

S.No	Author	Year	Type Of Study	Key Points	Quality of Study
1.	Hobkirk JA	2005	Review	Prosthodontics has a long history of innovation and adaptability	Strong
2.	Yumpu.com	2020	Review	Reframing the Future of Prosthodontics Growing Prosthodontics	Moderate
3.	Sadowsky , et al	2005	Review	Historical changes have taken place in dentistry	Strong
4.	Akagawa	2006	Review	Achieve greater recognition for prosthodontic	Strong
5.	Carlsson , et al	2006	Review	Prosthodontic treatment of depleted, damaged dentitions varies widely, but the replacement of missing teeth	Moderate
6.	Pradeep kumar , et al	2016	Review	Prosthodontics is a well defined and broad dental specialty catering to a wide range of oral rehabilitative treatment needs of the community.	Moderate

Narby	2011	Review	An emancipatory perspective with the patient-dentist dialogue was regarded as central for an optimal treatment result in the prosthetic treatment decision-making process.	Strong
Levin	1994	Review	Threats to the integrity of the dentition have been through the application of prosthodontic	Strong
emark , et al	1997	Review	Implants are well developed .Used for prosthodontic treatments .	Moderate
land , et al	2003	Review	Implants are the principles of osseointegration.	Strong
ven , et al	2004	Review	Prosthodontics are high cost efficient treatment	Strong
duo , et al	2004	Review	Prosthodontics is defined as the dental specialty pertaining to the diagnosis, treatment planning, rehabilitation	Strong
on Melton , et al	2000	Review	The clinical skills required to deliver excellent complete denture care are also paramount to successful implant prosthodontic	Moderate
ove WB	1976	Review	The geographic areas served by licensed dental mechanics will increase	Moderate
atani , et al	2001	Review	Future in prosthodontics , bridges are needed.	Moderate
kotjo , et al	2008	Review	preclinical prosthodontics clock hours are on average shorter than other schools	Strong
ng , et al	1999	Review	The undergraduate dental curriculum is undergoing rapid change and revision in dental schools	Strong
oper , et al	2009	Review	Prosthodontics is the specialty responsible for restoration of individual teeth and replacement of missing teeth and supporting structures	Weak

19.	Ariga P , et al	2018	Review	Various anthropometric measurements have been used to determine the size of maxillary anterior teeth.	Strong
20.	Jothi S	2017	Research	In total 22 patients were wearing partial dentures.	Strong
21.	Duraisamy R , et al	2019	Research	The mean microgap at the implant-abutment interface at the external, middle, and internal points was 1.597, 1.399, and 1.831 μm	Strong
22.	Subhashree , et al	2016	Review	Microbial resistance has reached a high level in recent times .	Strong
23.	Ganapathy D , et al	2016	Research	ANOVA inferred a statistically significant difference between the four test specimens with regards to vertical and horizontal marginal discrepancy after cementation ($F=9.092$, $p<0.001$), ($F=10.97$, $p<0.001$).	Strong
24.	Subashree S , et al	2016	Review	Aloe vera is used for various purposes and also for the curing of the skin infections.	Strong
25.	Ranganathan , et al	2017	Research	The cervical and incisal marginal discrepancy scored $F = 243.408$, $P < 0.001$ and $F = 180.844$, $P < 0.001$, respectively.	Strong
26.	Vijayalakshmi , et al	2016	Review	Cellulites are the powerful skin bacterial infection .	Strong
27.	Ganapathy , et al	2017	Review	The abutment screw loosening has been a common clinical mishap affecting the success of the implant in the long run.	Strong
28.	Suvitha, et al	2016	Cross sectional study	Awareness towards patients that missing teeth has to be restored with ceramics.	Strong
29.	Ashok , et al	2014	Research	Two piece magnet retained hollow lip bumper prosthesis was fabricated to reduce the weight of the denture and to attain esthetics.	Strong
30.	Venugopalan , et al	2014	Review	Patients with orocutaneous fistulas suffer from discomfort in terms of facial esthetics	Strong
31.	Kanna Abinaya , et al	2018	Review	For teeth replacements , that is in case of crown placement , gingival retraction should be done	Strong
32.	Basha Farhat , et al	2018	Review	Proper dental care during pregnancy is very important.	Strong
33.	Ajay R , et al	2017	Original study	In relation to the subgroups, the bond strength of $Zn_2(PO_4)_3$ was higher in Group I than in Group II. The bond strength in subgroup IV was superior in both Group I and Group II ($547.170 \text{ N} \pm 5.752$ and $531.975 \text{ N} \pm 6.221$ respectively.	Strong

Prosthodontics curriculum clock hours, prosthodontics teaching participation, and plans for specialization were also analyzed , hypothesized that reduced hours and perceived stress in the prosthodontics curriculum might impact students' choice of specialty at HSDM. The shortened preclinical didactic and laboratory exercises in prosthodontics at HSDM affect student anxiety, but not their didactic and clinical performances or their decisions in choosing their graduate program. Problem-based learning (PBL) tutorials help the students to integrate preclinical and clinical knowledge and skills in prosthodontics [32].

The undergraduate dental curriculum is undergoing rapid change and revision in dental schools worldwide. Decreasing edentulism, the advent of the clinical dental technician, and advances in technology (such as dental implantology) have led to changes in patient management and treatment options for general dental practitioners in New Zealand [33] . Prosthodontics is the specialty responsible for restoration of individual teeth and replacement of missing teeth and supporting structures, where education and experience have been focused on esthetics, comfort, and function. The American College of Prosthodontists (ACP) has made commitments to strengthen the quality and scope of both undergraduate and postgraduate educational programs and to support prosthodontics educators [34].

CONCLUSION

Prosthodontics was second only to oral surgery in its appearance as a dental specialty. It has proven to be a remarkably acceptable and innovative branch of the subject as it has evolved and responded to expanding and sophisticated patient needs and technologies. Assessment of its current trends, innovative thoughts generated, emerging technologies etc, as well as how these are contributing to overall shaping the future of prosthodontics.

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