

EDITORIAL

Current laboratory research in pediatric dentistry

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Introduction

Children oral diseases constitute a public health issue which can negatively affect children's life quality as well as further systemic conditions [1]. Although oral diseases can be prevented, their severity can increase in case no preventive and treatment measures are taken at the proper time [2]. Early life oral health conditions are considered to be predictors of the oral health status in adolescence, adulthood and elderly people [3]. Therefore, pediatric dentists are requested to urgently identify the presence of unhealthy habits from the first years of life of children as well as to educate the parents and family members to correct them [4]. Anyway, in case such preventive strategies are not put into practice, children can manifest oral health problems, such as dental caries, erosive tooth wear (ETW), hypomineralization and malocclusion, negatively impacting on the subsequent stages of life [5–7]. Moreover, if prevention fails, minimally invasive approaches and new dental materials and technologies are now at disposal of pediatric dentists to restore children's oral health [8].

In 2023, the Journal of Clinical Pediatric Dentistry has collected much research dealing with different aspect of this clinical field. A relevant corpus of published literature in the Journal consisted of laboratory research (20 contributions were included in this Editorial). One of the topics treated consisted of the evaluation of the oral microbiome in children with and without early childhood caries in order to detect potential therapeutic targets or diagnostic markers to early predict and prevent children's caries (contribution 1). Another research was conducted to evaluate the potentiality of stem cells derived from human exfoliated deciduous teeth (SHED) in 3D spheroid formation which could have implications for the therapeutic application of mesenchymal stem cells in regenerative medicine and tissue engineering (contribution 2). Focussing on the safety of dental materials, the release of bisphenol A and human cell apoptosis induced by 3D-printed resins has been studied (contribution 3).

Another research corpus has been focused on the enamel

structure, conducting an X-ray diffraction crystalline analysis on the enamel properties of pediatric patients affected by chronic kidney disease (contribution 4) and evaluating in infant rats the pathological damage induced by iron level on the enamel remineralization (contribution 5). As regards the remineralization process, the effect of the LED (Light Emitting Diode) photopolymerizing light on the penetration of silver diamine fluoride into dentin has been investigated (contribution 6).

Subsequently, different published articles have addressed the topic of surface properties of restorative materials. In particular, the effects of endogenous acids on pediatric restorative materials has been evaluated through a SEM (Scanning Electron Microscope) analysis (contribution 7). Similarly, the effect of industrialised acidic beverages has been evaluated on pit and fissure sealants (contribution 8) and on flowable composite resins (contribution 9). Additionally, surface properties and the colorimetric changes of restorative materials used with different polishing procedures in pediatric dentistry has been also investigated (contribution 10). The impact of three different fissure preparation techniques on the microleakage of a colored flowable composite used as a fissure sealant was also a research topic (contribution 11).

Innovative materials, like mineral trioxide aggregate (MTA) or Biodentine, have been introduced in recent years in clinical dentistry and their different applications encompasses even the pediatric field. The fracture resistance of substance on inflamed pulp constituted a research topic (contributions 12 and 13).

The present Journal also collected original articles dealing with endodontics in pediatric dentistry. In particular, the efficacy of distinct needle designs on smear layer removal has been studied through a SEM analysis (contribution 14). The precision of an electronic apex locator was investigated in presence of sodium hypochlorite in primary teeth both with and without resorption (contribution 15). An *ex vivo* study was conducted to assess the efficacy of pediatric rotary, rotary and

reciprocating instrumentations on the reduction of the bacterial load bacterial in primary molars (contribution 16). Finally, an *in vitro* study tested a short composite fiber-reinforced composite on the fracture resistance of immature permanent anterior teeth with simulation of regenerative endodontic procedures (contribution 17).

Regarding the prosthodontic application in pediatric dentistry, the fracture strength was tested according to the post's diameter and length in zirconia crown restorations on three-dimensional printed primary incisors following pulpectomy (contribution 18). Additionally, a study compared the morphological properties of the primary first molars and the forms of stainless steel crowns used in case of extensive decays (contribution 19).

Finally, as regards the orthodontic field, the link between buccally displaced canine with palatal and craniofacial features in adolescents was investigated (contribution 20).

Previous research has highlighted the reduced number of papers on pediatric dentistry issues in pediatric journals. Despite manuscripts have increased in the last two decade, their number is still small compared to the amount of literature on pediatric issues [3, 9, 10]. The research area of major pediatric interest in the dental field is represented by caries and dental public health-related issues [11–17]. It would be desirable if the number of papers on pediatric dentistry arise along with the overall interest by the pediatric scientific community, with a more strict relation between pediatricians and pediatric dentists. Considering *in vitro* research studies, their conduction could be relevant for the preliminary development of materials and techniques which should be subsequently tested *in vivo*. On the basis of this consideration, clinical research should be promoted considering that its results can be directly applied in clinical practice. Finally, narrative and systematic reviews are expected to resume the actual evidence and to guide the clinical decisions promoting the development of guidelines. Accordingly, the Journal of Clinical Pediatric Dentistry will welcome future studies and reviews aiming to improve the research and clinical knowledge on pediatric dentistry.

Availability of Data and Materials

The data are contained within this article.

Author contributions

AS—performed conceptualization and manuscript review. SG—performed data extraction and wrote the draft text. Authors equally contributed to the present research. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Not applicable.

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Conflict of interest

The authors declare no conflict of interest. Andrea Scribante is serving as the Editor in Chief of this journal, and Simone Gallo is serving as the Editorial Board member of this journal.

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