

Clinical Management in Dentistry

“The Application of Advanced Techniques for Dental Practice”

AUTHORS

Agus Sumono, *et al.*

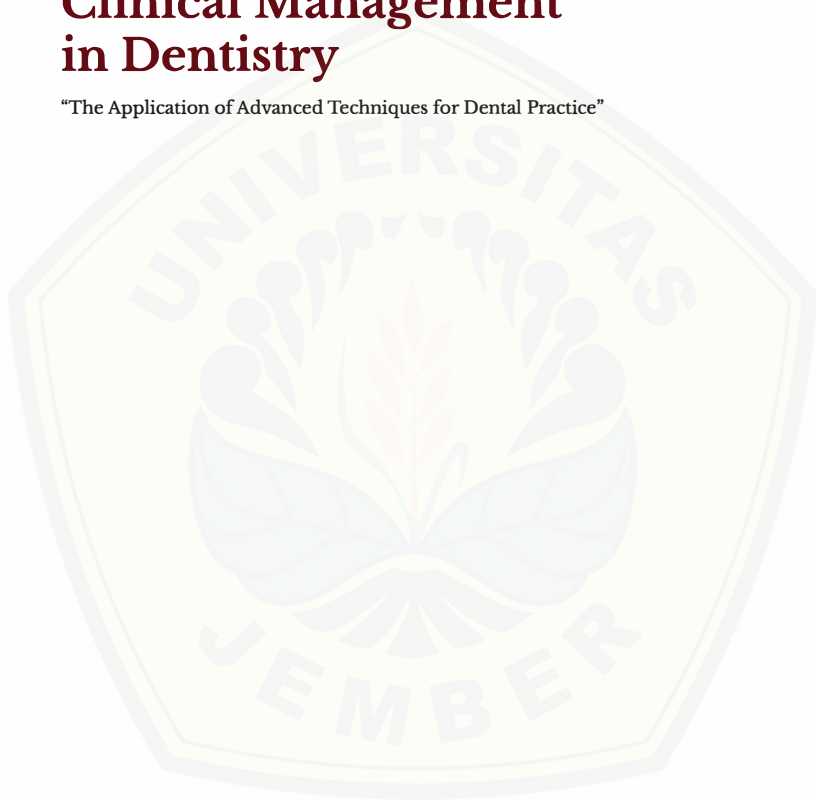


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**CLINICAL MANAGEMENT IN DENTISTRY
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Foreword

First of all, thanks to Allah SWT the help of Allah, the authors finished writing the reference book entitled “Clinical Management in Dentistry: The Application of Advanced Techniques for Dental Practice”. In these two years, dental informatics has applied many technological advances and discoveries to become a medical research discipline of significant scale and scope. The purpose of writing this book is to update our knowledge and gain experience in dentistry sciences. The book covers various topics in dental science, technology, health issues, etc.

The dental profession is responsible for preventing, diagnosing, and treating diseases and disorders of the oral cavity and related structures. Advances in dental technology have led to dramatic improvements in the ability of practitioners to restore tooth structure, replace lost teeth, and change the appearance of intrinsically or extrinsically discoloured teeth. I want to express our deep appreciation to all the authors for sharing their knowledge and experience for this book.

I hope this book is helpful for all of us
Thank you

Dean of Faculty of Dentistry of Universitas Jember

drg. R. Rahardyan Parnaadji, M.Kes., Sp.Pros



Preface

Praise be to Allah, God Almighty, for His mercy and grace, so that this book can be completed.

We thank those who support us regarding this book from the writing process until its published, namely the researchers, writers, reviewers, publishers, and many more that we cannot mention one by one.

This book titled “*Clinical Management in Dentistry: The Application of Advanced Techniques for Dental Practice*” is a collection of research results in the field of dentistry. The purpose of writing this book is to update our knowledge and gain experience in dentistry sciences as well as improve the quality of dental practice management in the midst of rapid technological changes

We realize that this book still has weaknesses and shortcomings. Therefore, we expect constructive criticism for it to be better. Finally, the writers hope that this book will be useful to all readers.



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Table of Content

v	Foreword
vii	Preface
ix	List of Contributors
1	The Effectiveness of Toothbrush and Tongue Cleaner on Students of The Faculty of Dentistry, University of Jember With Coated Tongue <i>Firda Dwi Ayu Ningtiyas, Dyah Indartin Setyowati, and I Dewa Ayu Ratna Dewanti</i>
9	Inhibition Ability of Cacao Pod Peel Waste's Extract (Theobroma Cacao L.) Against Dental Root Canal's E. Faecalis <i>Dhea Kartika Suradi, Dwi Warna Aju Fatmawati and Raditya Nugroho</i>
15	Prevalence Root Dilaceration Maxillary Incisors Based on Panoramic Radiography in Orthodontia Clinic Dental Hospital University of Jember <i>Esti Maulidya Suryaningrum Swasthi Prasetyarini, Herniyati and Supriyadi</i>
26	Shear Strength Cacao Pulp Extract as Etching Material in Composite Resin Fillings <i>Ahmad Alan Suhaimi, Dwi Warna Aju Fatmawati, Agus Sumono, Roedy Budirahardjo and Rudy Joelijanto</i>
33	The Relationship of Gingivitis with The Habit of Brushing The Tooth in SDN Nogosari 07 Rambipuji Jember <i>Niken Probosari, Roedy Budirahardjo and Gita Hindah Cahyani</i>

44

Mechanism of Purple Leaves Extract in Reduce The Number of Lymphocytes in Traumatic Ulcer

Atik Kurniawati, Leni Rokhma Dewi and Annisa Ayah Esa Salwa

54

Literature Review Article: Aging in Oral Tissue

Zahreni Hamzah

67

Case Report: Early Detection of Leukemia at Oral Mucosa on an Elderly Woman Patient

Toni Masruri and Nurhani Azizi

74

Effect of Red Pomegranate Extract (Punica Granatum) on Periodontal Abscess Rat Model on The Number of Macrophages Induced by Porphyromonas Gingivalis

Melok Aris Wahyukundari, Budi Yuwono and Kevin Justisio

82

The Relation Between Dental Caries and Quality of Life in Preschool Children in Summersari District, Jember Regency

Rosi Latifa Hariyanti, Ari Tri Wanodyo Handayani and Ristya Widi Endah Yani

94

Antibacterial Ability of Cacao Peel Waste Extract (Theobroma Cacao L.) Against Streptococcus Sanguinis in Dental Root Canal

Nadia Alfiana Uba, Raditya Nugroho and Dwi Warna Aju Fatmawati

99

Effects of Ethanol Extract of Belimbing Wuluh Leaves (Averrhoa Bilimbi L.) on The Number of Osteoblasts of The Alveolar Bone in Tension Area of Male Wistar Rats Given Orthodontic Mechanical Strength

Happy Harmono, Herniyati and Fransisca Wulan Widiastuti

109

The Identification of LIP Print Pattern at Papua Population and Java Population

Masniari Novita, Maria Eklevina Wangguway and Dwi Kartika Apriyono3

121

Description of Quality of Life Related to Underweight Children's Dental and Mouth Health

Ristya Widi Endah Yani, Kiswaluyo and Surartono Dwiatiemoko

127

The Potency of Rats as Animal Model of Alveolar Bone Remodeling Induced by Orthodontic Tooth Movement

M.N. Amin

136

Tensile Strength of Glass Ionomer Cement (GIC) After Addition of Gourami Fish Scales Powder Nanoparticles

Karenina Cahyanissa, Erawati Wulandari and I Dewa Ayu Ratna Dewanti





The Effectiveness of Toothbrush and Tongue Cleaner on Students of The Faculty of Dentistry, University of Jember with Coated Tongue

Firda Dwi Ayu Ningtiyas,^{1*} Dyah Indartin Setyowati,² and
I Dewa Ayu Ratna Dewanti³

INTRODUCTION

According to Basic Health Research (Riskesdas) in 2018, the percentage of the Indonesian population with dental and oral problems was 57.6%.¹ Some dental and oral diseases that occur are caused by a lack of maintaining dental and oral hygiene as well as a lack of knowledge about dental and oral hygiene. Halitosis has intraoral and extra-oral causes. More than 90% of halitosis cases have an oral origin and can be associated with deep carious lesions, periodontal disease, oral infections, peri-implants, pericoronitis, mucosal ulceration, debris, factors that cause decreased salivary flow, and especially coated tongue.² According to the American Dentist Association (ADA), tooth brushing alone can only reduce halitosis by 25%. Meanwhile, the use of toothbrushes and tongue cleaners can reduce halitosis by 85%. People are accustomed to brushing their teeth and using mouthwash to maintain dental and oral health. However, people rarely use tongue cleaners and pay attention to tongue hygiene.³

One condition of the tongue that is often found is coated tongue. A coated tongue is a clinical condition that occurs on the surface of the tongue that is covered

Inhibition Ability of Cacao Pod Peel Waste's Extract (Theobroma Cacao L.) Against Dental Root Canal's *E. Faecalis*

Dhea Kartika Suradi,^{1*} Dwi Warna Aju Fatmawati,² and Raditya Nugroho²

INTRODUCTION

Root canal treatment is one of the endodontic treatments to maintain teeth that have experienced pulpal or periapical infection.^{7,8} *E. faecalis* is one of the dominant facultative anaerobic gram-positive bacteria in pulp or periapical infections.^{4,5} This bacteria has the ability to survive in conditions with low nutrient availability, bind to dentin, invade the dentinal tubules, alter host response, inhibit lymphocyte action, compete with other bacteria, form biofilms, and are resistant to calcium hydroxide administration.¹ *E. faecalis* is the cause of primary root canal infection (4-40%) and secondary root canal infection (24-77%).¹⁴ *E. faecalis* remaining in the root canal will significantly reduce the success rate after root canal treatment.

2,5% NaOCl is a strong base with a pH of more than 11.⁸ 2,5% NaOCl is one of the frequently used irrigation solutions, which not only has an antibacterial effect but also has the ability to dissolve organic solutions in root canals.⁵ However, 2,5% NaOCl has an unpleasant taste, is unable to dissolve inorganic components of the smear layer, cytotoxicity and caustic effects on healthy periradicular tissues on inadvertent extrusion during the irrigating procedure.⁴

Prevalence Root Dilaceration Maxillary Incisors Based on Panoramic Radiography in Orthodontia Clinic Dental Hospital University of Jember

Esti Maulidya Suryaningrum,¹ Swasthi Prasetyarini,² Herniyati,³ and Supriyadi⁴

INTRODUCTION

Panoramic radiography also known as *panorex* or *orthopantomography* is one of the extraoral radiographic techniques that is often used in dentistry.¹ There are 71.2% panoramic radiographs are mostly used by dentists for analyzing eruptions and tooth germs.² Panoramic radiographs can also be used to reveal the root length and the direction of the tooth axis in orthodontic treatment, describe pathological conditions, normal variations and detect dental anomalies.³

Dental anomalies are changes in tooth structure that arise as a result of deformities during tooth formation due to various factors including environmental and genetic. Tooth anomalies include number, shape, size, position and structure.⁴ There were 272 (56.9%) of the 478 panoramic radiographs that has dental anomalies in the Brazilian population and 47.28% of them were dental anomalies.⁵ Dental anomalies can complicate dental treatment such as root canal treatment

Shear Strength Cacao Pulp Extract as Etching Material in Composite Resin Fillings

Ahmad Alan Suhaimi,^{1*} Dwi Warna Aju Fatmawati,² Agus Sumono,³ Roedy Budirahardjo⁴ and Rudy Joelijanto⁵

INTRODUCTION

Composite restorations are adhesive restorations whose basic principle of bonding with teeth is micromechanically (*mechanical-interlocking*), namely from *resin tags* on the microporosity of the etched enamel surface.¹ Etching is an acidic chemical that removes the mineral surface of the tooth and forms *micropores* that make the enamel surface rough so that the composite resin can bond to the tooth surface and form *a resin tag*. The acid etching material often used is phosphoric acid with a concentration of 37%.^{2,3}

Phosphoric acid is a strong acid.⁴ Strong acids can release more H⁺ ions than weak acids because they can completely ionize.^{5,6} The more H⁺ ions, the more dissolved tooth minerals.⁷ The more dissolved minerals because the lower the hardness (*microhardness*) of the enamel.⁸ Reduction *microhardness* can also lead to impaired adhesion to the filling material.⁹

The use of medicinal plants as alternative materials is currently growing.¹⁰ Cocoa is one of the medicinal plants that is widely used as an alternative material today. Cocoa pulp is a white, slimy membrane that covers the cocoa bean, making up about 25-30% of the weight of the cocoa bean.¹¹ The pulp is a white or pale yellow mucus layer covering the cocoa bean's surface. The pulp is a thick layer

The Relationship of Gingivitis with The Habit of Brushing The Tooth in SDN Nogosari 07 Rambipuji Jember

Niken Probosari,^{1*} Roedy Budirahardjo,¹ and Gita Hindah Cahyani²

INTRODUCTION

The gingiva is a part of the oral mucosa consisting of the alveolar mucosa, mucogingival junction, attached gingiva, free gingival groove, and interdental gingiva. The clinical picture of the gingiva color is coral pink, has stippling or spots like orange peel, can not be moved because it is attached to the underlying structure, and is supple.¹ Gingivitis is an inflammation involving the soft tissues of the gingiva caused by plaque buildup. Symptoms of gingivitis include redness, swelling, and bleeding. Gingivitis is divided into 2 types, acute and chronic. There are several factors that cause gingivitis, it can be caused by the accumulation of plaque, failed restorations, orthodontic appliances, systemic, and others.³

Cases of periodontal disease at all ages have a percentage of 73.1%.⁴ In 2018, almost 90% of the world's population suffered from gingivitis and 80% of them in children aged < 12 years.⁵ The prevalence of gingivitis will continue to increase with age until it reaches the age of puberty.¹ Gingival health examination can use periodontal status examination.⁷ Periodontal status is a condition of periodontal tissue that can be measured and observed with a certain index. One of the indexes used is the Modified Gingival Index (MGI).⁸

to be susceptible to bacterial infection. The bacterial species that cause gingivitis are *Streptococcus sp.* and several others.^{3,15}

Gingivitis secondary factors are divided into 2, namely local and systemic factors. Local factors predispose to the accumulation of plaque deposits that block plaque. These factors are failed restorations, carious cavities, piles of food debris, poorly designed removable partial dentures, orthodontic appliances, irregular arrangement of teeth, smoking, and microorganism.⁵ Systemic factors are factors that affect the body as a whole, such as genetic factors, nutritional factors, hormonal factors, hematological factors.¹⁶

Table 4 shows that most of the subjects had mild inflammation criteria, which is 67.5%. Gingivitis that occurs in children is mostly a mild type of gingivitis and *reversible*. This is because in children the inflammatory response that occurs due to the accumulation of plaque tends to be slow due to the lack of exudate from inflammation and neutrophils in the gingival connective tissue.^{17,18}

Table 5 shows that students brushing their teeth with very good criteria have the highest percentage is 37.7%. Basically most of the subjects already have the habit of brushing their teeth enough but not done well. In children with an age range of 10-12 years, there is an increase in better motor and cognitive abilities.¹⁹

Table 6 shows 7 statements that represent the subject's brushing habits. The statement that has the highest percentage is that the subject often brushes the entire surface of the teeth with a back-and-forth motion (scrub brush method), which is 79.2%. The habit of brushing teeth has several indicators, there are frequency, time, use of toothbrush and toothpaste, duration, and method. The effective time to brushing teeth is at after breakfast and before going to bed at night. At night, saliva production decreases so it is less effective in neutralizing the acidic atmosphere in the oral cavity and causing an increase in the growth of plaque-causing bacteria in the mouth.¹²

Mechanical plaque removal using a toothbrush and toothpaste has been shown to be more effective at removing food debris and preventing gingivitis.² In children, it is recommended to use a toothbrush with a round brush head and soft bristles so as not to cause gingival recession even though the frequency of brushing is increased.^{20,21} Toothpaste contains abrasive ingredients that are used in combination with a toothbrush to clean the surface of the teeth by helping to remove plaque and pellicle without remove the enamel layer.²² A good brushing duration of at

Mechanism of Purple Leaves Extract in Reduce The Number of Lymphocytes in Traumatic Ulcer

Atik Kurniawati,^{1*} Leni Rokhma Dewi,² and Annisa Ayah Esa Salwa³

INTRODUCTION

Traumatic ulcers were ulcers or lesions caused by trauma due to being bitten, scratched by dentures, trauma due to heat, and so on.¹ The number of cases of traumatic ulcer were quite high compared to other oral cavity lesions. In 2016 at the dental and oral hospital in Indonesia, a study was conducted on the number of patients treated at the Oral Medicine Clinic, namely the Dental and Oral Hospital, University of Jember. The results of the study stated that of 766 Oral Medicine Clinic patients, the prevalence of traumatic ulcers was 6.5% of 766 patients.² The healing process in traumatic ulcers consists of four stages or phases, namely hemostasis, inflammation, proliferation, and tissue remodeling phases.³ In the hemostasis phase, platelet aggregation and capillary vasoconstriction occur. Furthermore, in the inflammatory phase, platelets release inflammatory factors and migration of inflammatory cells, namely lymphocytes, PMNs, and macrophages to the trauma area plays a role in the phagocytosis of antigens in wounds.⁴ At the end of the inflammatory phase, the number of inflammatory cells begins to decrease, followed by a proliferation phase characterized by an increase in the number of fibroblasts, followed by a maturation or tissue remodeling phase characterized by the formation of scar tissue and collagen deposition.⁵

Literature Review Article: Aging in Oral Tissue

Zahreni Hamzah*

INTRODUCTION

The mouth is the main entry point for almost all substances into the body. The structure of the oral cavity tissue is limited by a mucous membrane. This structure is formed from a moist soft tissue membrane that extends from the junction between the vermilion border of the lip, the anterior labial mucosa, to the posterior palatopharyngeal fold. Histologically, the oral mucosa is composed of three layers, (1) stratified squamous surface epithelium, with keratin, parakeratin or without keratin; underneath is (2) connective tissue, named the lamina propria, that is attached directly to bone or muscle; and (3) dense irregular connective tissue, named the submucosa. Submucosal tissue is found in the deepest part of the lining of the oral cavity. The deeper layers of the epithelium are known as rete pegs. There is a non-cellular basement membrane in below this tissue, which is firmly attached to each other. The basement membrane provides support for the basal epithelial cells to communicate with the connective tissue.⁴

The oral mucosa plays several crucial roles, including secretion, sensation (temperature, touch, taste, pain), perception, and prevention of water loss. It also protects the underlying tissue from mechanical, chemical, and biological stressors. The squamous stratified epithelium strictly regulates the function of the oral tissue structure, giving it a strong ability to withstand injury from the masticatory process, microbial antigens, toxic foods and drinks, and/or air pollutants that enter the oral cavity.¹

Aging-related microbial dysbiosis of the oral cavity tissues can result in metabolic endotoxemia, which is marked by elevated levels of pro-inflammatory cytokines such IL-1, IL-6, and TNF- α . This pro-inflammatory will cause

Case Report : Early Detection of Leukemia at Oral Mucosa on an Elderly Woman Patient

Toni Masruri^{1*} and Nurhani Azizi²

INTRODUCTION

Leukemia is a malignant disease that occurs due to malignant transformation and abnormal proliferation of one or more blood-forming elements and is accompanied by infiltration into the bone marrow and other organs so that there is a failure to form a normal hematopoietic system that causes the death of the patient.¹ Leukemia is also called a malignancy of one of the blood-forming cellular elements, mostly composed of immature *precursors (blasts)*, mainly involving blood, bone marrow, or both.^{2,3,4,5}

Broadly speaking, leukemia is divided into 4 major parts, namely (1) *Acute Myelogenous Leukemia (AML)*; (2) *Acute Lymphocytic Leukemia (ALL)*; (3) *Chronic Myelogenous Leukemia (CML)*; and (4) *Chronic Lymphocytic Leukemia (CLL)*.^{2,3} AML is more common in patients over 55/60 years of age, while ALL is more common in children.^{2,5} CLL is most common in older patients (70 years old), while CML is also common in older patients (65 years old).⁶

The diagnosis of this disease is made by proper history taking, usually complaints of anemia (pallor), bleeding, fever. The clinical picture is not typical because some symptoms are also found in other diseases. Complaints of pallor, weakness, lethargy,

Effect of Red Pomegranate Extract (*Punica Granatum*) on Periodontal Abscess Rat Model on The Number of Macrophages Induced by *Porphyromonas Gingivalis*

Melok Aris Wahyukundari,^{1*} Budi Yuwono² and Kevin Justisio³

INTRODUCTION

Periodontal abscess is an acute or chronic condition that occurs in the periodontal tissue caused by local bacterial infection, this abscess is formed due to endogenous pyogenic microorganisms. The prevalence of dental and oral disease in Indonesia is still high at 57.6%, periodontal abscess ranks seventh in dental and oral disease.¹ Abscess is a localized pus due to infection that can occur in all structures of the oral cavity. Periodontal abscess is a localized purulent inflammation localized to the periodontium, this abscess usually occurs in patients with periodontitis who do not undergo treatment.² Patients with periodontal abscess will usually be given antibiotics to inhibit the bacteria, but it often causes resistance. Several studies have described penicillin resistance such as amoxicillin, tetracycline, and metronidazole reaching 30–80% against *Porphyromonas gingivalis*.³ Antibiotic resistance to microbes can cause disease prolongation, increased risk of death, and longer hospital stays. Response to treatment can be slow or even fail,

The Relation Between Dental Caries and Quality of Life in Preschool Children in Summersari District, Jember Regency

Rosi Latifa Hariyanti,^{1*} Ari Tri Wanodyo Handayani² and Risty Widi Endah Yani^{2*}

INTRODUCTION

Dental caries is the most common dental and oral health problem in children in Indonesia, including in Summersari District. Summersari District is an area that has a very high percentage of caries cases. Dental caries is a disease of the hard tissues of the teeth characterized by tissue damage, starting from the surface and then extending to the pulp. Dental and oral health problems such as caries are things that need special attention and have an important role in general health.¹ The caries process in children's teeth can last for 6-24 months so that 3-5 years of age are susceptible to caries due to the influence of food or drink residues, and children aged 3-5 years still need the help of others in cleaning it oral cavity. Caries can interfere with daily activities and can affect general health. Health is an important outcome measure in quality of life.²

The ICDAS index is a valid and reliable index, designed to assess caries based on the stage of its development with six well-defined categories ranging from early changes in enamel to more extensive cavities.³

Antibacterial Ability of Cacao Peel Waste Extract (Theobroma Cacao L.) Against Streptococcus Sanguinis in Dental Root Canal

Nadia Alfiana Uba,^{1*} Raditya Nugroho,² and Dwi Warna Aju Fatmawati²

INTRODUCTION

Cocoa is the mainstay commodity of plantations, the third largest contributor to foreign exchange, the plantation sub-sector after rubber and palm oil.¹ As much as 22% of the cocoa pods in the form of seeds are used to be processed into chocolate products and the rest is in the form of skins and placenta of cocoa pods.² Increased production of cocoa pods has an impact on an increase in the amount of waste that is currently used only as fertilizer and alternative energy sources such as biochar briquettes. Cocoa pod peel waste is known to have benefits as analgesic, antifungal, anti-inflammatory, anti-wrinkle, antioxidant, and antibacterial. 25% has greater antibacterial power than the antibacterial power of 2.5% NaOCl concentration.^{3,4}

Streptococcus sanguinis is a commensal bacteria that is widespread in the oral cavity such as on the surface of the teeth, the surface of the oral mucosa, and in human saliva with the ability as a pioneer bacterium for plaque formation, causing dental caries, periodontal disease, and failure of root canal treatment. Root canals are important to prevent more bacteria from entering and re-infection.⁶ Irrigation is one of the factors that also plays a role in root canal treatment.⁷

Effects of Ethanol Extract of Belimbing Wuluh Leaves (*Averrhoa Bilimbi* L.) on The Number of Osteoblasts of The Alveolar Bone in Tension Area of Male Wistar Rats Given Orthodontic Mechanical Strength

Happy Harmono,^{1*} Herniyati² and Fransisca Wulan Widiastuti³

INTRODUCTION

Malocclusion is one of the dental and oral health problems in Indonesia whose prevalence reaches 80% and ranks third after dental caries and periodontal disease.¹ Malocclusion is a malrelation between the arches of the jaw or an anomaly in the position of the teeth, number, shape, and position of tooth development.² The severity of the malocclusion is related to the need for orthodontic treatment.

Orthodontic treatment takes a relatively long time. According to American Board of Orthodontics (ABO) standards, each case has an average duration of single-phase orthodontic treatment of 24.6 months.³ Various methods have been developed to speed up orthodontic treatment time. However, methods that are more affordable methods and provide minimal side effects are needed so that the use of herbal plants continues to be developed.

The Identification of LIP Print Pattern at Papua Population and Java Population

Masniari Novita,^{1*} Maria Eklevina Wangguway² and Dwi Kartika Apriyono¹

ABSTRACT

Background: Forensics identification is an effort occurred to help the investigator determine someone's identity. Identity determination is the most vital part of an investigation. One of the forensics identification techniques that can be used to identify someone is lip print. **Purpose:** This research aimed to discover whether there is a difference of lip print patterns at the Papua population and the Java population. **Method:** This research is descriptive observational research with a cross-sectional approach (cross-cut study). The research samples are 200 samples consisted of 100 samples Papua population and 100 samples of Java population. **Result:** This research result shows that the lip print pattern in the Papua population is dominant on type III, type II, and type I. Meanwhile, the dominant lip print types in the Java population are type II, type III, and type I. **Conclusion:** There is a typical difference of lip print pattern in Papua population and Java population. The most dominant distribution on Papua population is type III and on Java population is type II.

Keywords: forensics identification, Java population, lip print pattern, Papua population

Description of Quality of Life Related to Underweight Children's Dental and Mouth Health

Risty Widi Endah Yani,^{1*} Kiswaluyo¹ and Surartono Dwiatmoko¹

INTRODUCTION

Several studies showed that the toddlers with severe dental caries tended to have underweight.¹ 33,5% and 7,0% of the toddlers identified as moderate underweight and extreme underweight had a prevalence of ECC significantly related to the underweight toddlers. The research of 350 children in Telangana, India resulted the average of dmf-t was 4,96 on the underweight children, the average of dmf-t was 4,64 on the normal children, the average of dmf-t was 2,73 on the overweight children, and the average of dmf-t was 4,49 on the obese children. There was a significant correlation between underweight toddlers and dental caries.²

Toothache in children is a common problem in developed country but the planned solution often becomes the low priority for the health policy maker. It is because of the perception believing that dental or oral disease is life threatening, whereas the disease has a significant impact to both social and life psychology (quality of life). The problem of oral health can affect the quality of life, either physical, social, or self-esteem.^{3,4}

The Potency of Rats as Animal Model of Alveolar Bone Remodeling Induced by Orthodontic Tooth Movement

M.N. Amin^{1*}

INTRODUCTION

The process of alveolar bone remodeling to move the teeth is a time-consuming process and requires visits for repetitive appliance activation leading to discomforting pain that results in most patients being uncooperative and not continuing the undergoing treatment.¹ Many studies have been conducted in manipulating the process of alveolar bone remodeling in order to shorten the process, one of which is the use of herbal ingredients that have efficacy in manipulating alveolar bone remodeling.

Health research includes biomedical, epidemiological, social, and behavioral studies. It can be undergone using *in vitro*, *in vivo*, and *in silico* approaches. If the results of the research are used for humans, it will be necessary to conduct further research using *in vitro* materials i.e. cell strains and tissue cultures. Nevertheless, to observe, to study, and to conclude all events in living creatures entirely require experimental animals since every part of their bodies has a value and there is interaction among the body parts.²

Ridwan discusses several reasons why animal models remain necessary in research, especially in the areas of health, food, and nutrition, i.e. a) diversity of research subjects can be minimized, b) research variables are more easily controlled,

Tensile Strength of Glass Ionomer Cement (GIC) After Addition of Gourami Fish Scales Powder Nanoparticles

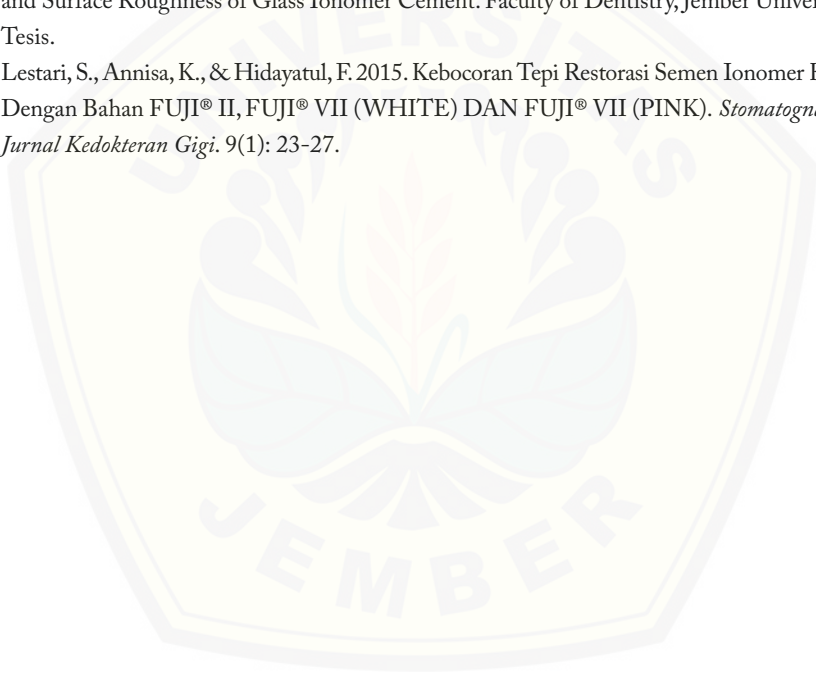
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INTRODUCTION

Good tensile strength is necessary for restorative materials so that the restorative material has good retention on the teeth and also reduces or eliminates edge leakage.¹ This attachment is the principle of adhesion which is one of the characteristics of GIC restorative materials.² The adhesion between GIC and tooth on enamel is better than that of dentin. This is because the enamel contains many minerals that are able to bind well to GIC.³ The average tensile strength of GIC modified resin (GICMR) is 1.52 MPa while the average tensile strength of conventional GIC is 1.02 Mpa. This shows that the tensile strength of conventional GIC is less good when compared to GICMR.⁴ Therefore, efforts are needed to increase the bond strength between GIC to dentin through the addition of components such as HAp present in GFSP (Gouramy Fish Scale Powder). Scales of gouramy fish contains mineralization in the form of HA with a concentration of 16% to 59%.

Previous research regarding the addition of GFSP to GIC with a concentration of 2.5%, 5% and 10%, it was found that the number and diameter of the smallest porosity, the smallest marginal gap and the largest compressive strength in GIC with the addition of 2.5% GFSP.^{5,6} The GFSP added in this study did not have a nanoparticle size, which was 74 μm , while the GIC powder had a size of 10 μm .

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