

DAFTAR PUSTAKA

1. Yudhit A, Harahap K, Nasution SC. *Effect of Hydroxyapatite From Nile Tilapia (Oreochromis niloticus) Scale on Surface Hardness of Conventional and Resin Modified Glass Ionomer Cement (In Vitro Study)*. Vol 32.; 2019.
2. Mozartha M, Praziandithe M, et al. *Pengaruh penambahan hidroksiapatit dari cangkang telur terhadap kekuatan tekan glass ionomer cement*.
3. Kumar G, Shivrayan A. Comparative study of mechanical properties of direct core build-up materials. *Contemp Clin Dent*. 2015;6(1):16-20. doi:10.4103/0976-237X.149285
4. Cahyaningrum SE, Herdyastuty N, Wiana F, Devina B, Supangat D. *Synthesis of hydroxyapatite from crab shell (scylla serrata) waste with different methods added phosphate.*; 2018.
5. Mozartha martha. hidroksiapatit dan aplikasinya di bidang kedokteran gigi. *Cakradonya Dent J*. 2015;7(2):807-868.
6. Utama MD, Ferry AN, Akbar FH, Muhammad Jayadi Abdi. (2022). Addition of hydroxyapatite from mud crab powder (scylla serrata) on the strength of gic (glass ionomer cement) cementation material: a literature review. *Journal of Pharmaceutical Negative Results*, 5966–5970. <https://doi.org/10.47750/pnr.2022.13.S09.714>.

7. Supangat D, Cahyaningrum SE. *Synthesis and characterization of hydroxyapatite of crabs shell (scylla serrata) by wet application method*. Vol 6.; 2017.
8. Arita K, Lucas ME, Nishino M. *The effect of adding hydroxyapatite on the flexural strength of glass ionomer cement*. Vol 22.; 2003.
9. Berg JH, Croll TP. Glass ionomer restorative cement systems: an update. *Pediatr Dent* . 2015;37(2):116-124.
10. Alobiedy AN, Al-Helli AH, Al-Hamaoy AR. Effect of adding micro and nano-carbon particles on conventional glass ionomer cement mechanical properties. *Ain Shams Engineering Journal*. 2019;10(4):785-789. doi:10.1016/J.ASEJ.2019.03.007
11. Gupta AA, Mulay S, Mahajan P, Raj AT. Assessing the effect of ceramic additives on the physical, rheological and mechanical properties of conventional glass ionomer luting cement – An in-vitro study. *Heliyon*. 2019;5(7). doi:10.1016/j.heliyon.2019.e02094
12. Garoushi SK, He J, Vallittu PK, Lassila LVJ. Effect of discontinuous glass fibers on mechanical properties of glass ionomer cement. *Acta Biomater Odontol Scand*. 2018;4(1):72-80. doi:10.1080/23337931.2018.1491798
13. Mustafa HA, Soares AP, Paris S, Elhennawy K, Zaslansky P. The forgotten merits of GIC restorations: a systematic review. *Clin Oral Investig*. 2020;24(7):2189-2201. doi:10.1007/s00784-020-03334-

14. Arita K, Yamamoto A, Shinonaga Y, et al. Hydroxyapatite particle characteristics influence the enhancement of the mechanical and chemical properties of conventional restorative glass ionomer cement. *Dent Mater J*. 2011;30(5):672-683. doi:10.4012/dmj.2011-029
15. Sajjad A, Bakar WZW, Mohamad D, Kannan TP. Characterization and enhancement of physico-mechanical properties of glass ionomer cement by incorporating a novel nano zirconia silica hydroxyapatite composite synthesized via sol-gel. *AIMS Mater Sci*. 2019;6(5):730-747. doi:10.3934/matensci.2019.5.730
16. Yap AUJ, Cheang PHN, Chay PL. Mechanical properties of two restorative reinforced glass-ionomer cements. *J Oral Rehabil*. 2002;29(7):682-688. doi:10.1046/j.1365-2842.2002.00908.x
17. Lucas ME, Arita K, Nishino M. Toughness, bonding and fluoride-release properties of hydroxyapatite-added glass ionomer cement. *Biomaterials*. 2003;24(21):3787-3794. doi:10.1016/S0142-9612(03)00260-6
18. Murugan R, Yazid F, Nasruddin NS, Anuar NNM. Effects of nanohydroxyapatite incorporation into glass ionomer cement (GIC). *Minerals*. 2022;12(1). doi:10.3390/min12010009
19. Anusavice. *Phillips' Science of Dental Materials*. 12th ed. elsevier; 2013.
20. Noort R van. *Introduction to Dental Materials*. 11th ed. Mosby Elsevier; 2013
21. Anusavice K. *Phillips' Science Of Dental Materials*. In: *St. Louis: Elsevier*.

11th ed. ; 2003:255.

22. Subramani K, Waqar A. Nanobiomaterials in Clinical Dentistry. In: Subramani K, Waqar A, eds. *Nanobiomaterials in Clinical Dentistry*. 1st ed. Elsevier; 2012.
23. Berzins DW, Abey S, Costache MC, Wilkie CA, Roberts HW. Resin-modified glass-ionomer setting reaction competition. *J Dent Res*. 2010;89(1):82-86. doi:10.1177/0022034509355919
24. McCabe JF, Walls AW. *Applied Dental Materials*. 1st ed. (McCabe JF, ed.). Willey; 2009.
25. Suprastiwi E, Anggraeni A, Ayu D, Artiningsih NP. Fluoride Released from GIC and RMGIC in Saliva and Dentino-Enamel Substance. *Makara Journal of Health Research*. 2009;13(2).
26. Sakaguchi R, Jack F, Powers J. *Craig's Restorative Dental Materials*. 14th ed. Elsevier; 2018.
27. Tenri Awaru B, Jekti Nugroho J. Restorasi pada gigi anterior setelah perawatan endodontik Restoration of anterior tooth after endodontic treatment. *Dentofasial*. 2012;11(3).
28. Vivekanand K, Krishna Prasad L, Chakravarthi P, et al. Egg shell derived hydroxyapatite as bone graft material in maxillofacial skeleton. A randomized blind multi-center clinical trial. *Front Bioeng Biotechnol*. 2016;4. doi:10.3389/conf.fbioe.2016.01.01893

29. Cahyaningrum SE, Herdyastuty N, Devina B, Supangat D. Synthesis and Characterization of Hydroxyapatite Powder by Wet Precipitation Method. In: *IOP Conference Series: Materials Science and Engineering*. Vol 299. Institute of Physics Publishing; 2018. doi:10.1088/1757-899X/299/1/012039
30. Mozartha M. Hidroksiapatit dan Aplikasinya di Bidang Kedokteran Gigi. *J Vis Lang Comput*. 2015;11(3):287-301.
31. Henggu KU, Ibrahim B, Suptijah P. Hidroksiapatit dari cangkang sotong sebagai sediaan biomaterial perancah tulang. *Jphi*. 2019;22:1-13.
32. Sasmita D. sintesis hidroksiapatit dari cangkang keong emas (*Pomacea canalicunata* Lamarck) melalui metode hidrotermal. *Anti-Corrosion Methods and Materials*. 2000;47:30-34.
33. Kementerian kelautan dan perikanan. *Pedoman Identifikasi Kepiting Bakau*.; 2016.
34. Humairah S, Karnila R, Loekman S. *Komposisi Kimia Tepung Cangkang Kepiting Bakau (Scylla Serrata)*.
35. Suprajaa PS, Baraneedharan · P, Reddy · B M. A Comparative Study of Nanohydroxyapatite Obtained from Natural Shells and Wet Chemical Process
KEYWORDS Hydroxyapatite Crab Shells Eggshells Calcination Wet Chemical Biomaterial. *Journal of Materials Science & Surface Engineering*. 2020;7(1):938-943. doi:10.jmsse/2348-8956/7-1.5
36. Endang S, Rauf N. *Pembentukan Hidroksiapatit pada Cangkang Kepiting Scyllaspp dengan Metode Pemanasan Berlanjut*. Vol 25.; 2018.

37. Arunseshan Chandrasekar, Suresh Sagadevan and Arivuoli Dakshnamoorthy
Synthesis and characterization of nano-hydroxyapatite (n-HAP) using the wet
chemical technique. *International Journal of Physical Sciences* Vol. 8(32), pp.
1639-1645, 30 August, 2013
38. Hassan Gheisaria, Ebrahim Karamianb, Majid Abdellahib dan Gheisari A novel
hydroxyapatite–Hardystonite nano composite ceramic. *Ceramics International*;
41(2015)5967–5975.
39. Moshaverinia A, Ansari S, Moshaverinia M, dkk. *Effects of incorporation of
hydroxyapatite and fluoroapatite nanobioceramics into conventional glass
ionomer cements (GIC)*. *Acta biomaterialia*. 2008;4(2):432-40.
40. Pasril, Y., and Pratama, W. A. 2013. Perbandingan Kekuatan Tekan Resin
Komposit Hybrid Menggunakan Sinar Halogen Dan LED. *IDJ*. 2(2). pp : 84-
85.
41. Purwasasmita, B.S. and Ramos, S.G. 2008. Sintesis dan Karakterisasi Serbuk
Hidroksiapatit Skala Sub-Mikron Menggunakan Metode Presipitasi. *Jurnal
Bionatural*. 10(2). pp : 156-157.
42. Choudhary K, Nandlal B. Comparative evaluation of shear bond strength of
nano-hydroxyapatite incorporated glass ionomer cement and conventional glass
ionomer cement on dense synthetic hydroxyapatite disk: An in vitro study.
Indian J Dent Res. 2015; 26(2): 170-7.

43. Sari NM, Tabaii ES, Vaziri AS, Ghaffari H, Kashani MA, Amirabadi GE. Effect of nano-hydroxyapatite incorporation into resin modified glass ionomer cement on ceramic bracket debonding. *J Islam Dent Assoc Iran* 2014; 26(3) : 208-13.
44. Sharafeddin F, Alavi AA, Siabani S, Safar M. Comparison of shear bond strength of three types of glass ionomer cements containing hydroxyapatite nanoparticles to deep and superficial dentin. *J Dent Shiraz Univ Med Scien* 2019; 20(1): 1-9.

Lampiran

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AWAL	5	21.70	35.90	28.6800	6.12389
ENAM	5	29.70	35.40	33.0800	2.20613
TUJUH	5	26.00	41.40	32.1800	5.99516
DLPN	5	20.70	30.00	25.1800	3.72250
SMBLN	5	25.50	30.30	28.0800	2.26870
Valid N (listwise)	5				

Tests of Normality

VAR00006		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
KELOMPOK	1.00	0.201	5	.200 [*]	0.933	5	0.614
	2.00	0.262	5	.200 [*]	0.927	5	0.573
	3.00	0.210	5	.200 [*]	0.942	5	0.678
	4.00	0.164	5	.200 [*]	0.978	5	0.925
	5.00	0.257	5	.200 [*]	0.839	5	0.162

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	ENAM ^b		Enter

a. Dependent Variable: AWAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780 ^a	0.609	0.479	4.42235

a. Predictors: (Constant), ENAM

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.337	1	91.337	4.670	.119 ^b
	Residual	58.671	3	19.557		
	Total	150.008	4			

a. Dependent Variable: AWAL

b. Predictors: (Constant), ENAM

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-42.972	33.215		-1.294	0.286	-148.675	62.732
	ENAM	2.166	1.002	0.780	2.161	0.119	-1.024	5.356

a. Dependent Variable: AWAL

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	TUJUH ^b		Enter

a. Dependent Variable: AWAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791 ^a	0.626	0.501	4.32532

a. Predictors: (Constant), TUJUH

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93.883	1	93.883	5.018	.111 ^b
	Residual	56.125	3	18.708		
	Total	150.008	4			

a. Dependent Variable: AWAL

b. Predictors: (Constant), TUJUH

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.676	11.768		0.227	0.835	-34.777	40.128
	TUJUH	0.808	0.361	0.791	2.240	0.111	-0.340	1.956

a. Dependent Variable: AWAL

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	DLPN ^b		Enter

a. Dependent Variable: AWAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.885 ^a	0.784	0.711	3.28943

a. Predictors: (Constant), DLPN

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	117.547	1	117.547	10.864	.046 ^b
	Residual	32.461	3	10.820		
	Total	150.008	4			

a. Dependent Variable: AWAL

b. Predictors: (Constant), DLPN

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	-7.989	11.222		-0.712	0.528	-43.703	27.725
	DLPN	1.456	0.442	0.885	3.296	0.046	0.050	2.862

a. Dependent Variable: AWAL

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	SMBLN ^b		Enter

a. Dependent Variable: AWAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.943 ^a	0.888	0.851	2.36312

a. Predictors: (Constant), SMBLN

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133.255	1	133.255	23.862	.018 ^b
	Residual	16.753	3	5.584		
	Total	150.008	4			

a. Dependent Variable: AWAL

b. Predictors: (Constant), SMBLN

Coefficients^a

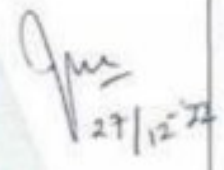
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	-42.758	14.662		-2.916	0.062	-89.421	3.904
	SMBLN	2.544	0.521	0.943	4.885	0.016	0.887	4.202



a. Dependent Variable: AWAL

LEMBAR PERBAIKAN
KARYA TULIS AKHIR (KTA) / TESIS
PROGRAM PENDIDIKAN DOKTER GIGI SPESIALIS (PPDGS)
PROSTODONSIA

Nama Mahasiswa : R. Alfian Djamaludin

Stambuk : J015 201 002

No.	Tim Penguji	Catatan Perbaikan/ Saran	Halaman	Tanda Tangan
1.	DR. drg. Ike Damayanti Habar, Sp. Pros (K)	<ol style="list-style-type: none"> 1. Masalah masalah apa yg muncul di klinik yg sering ditemui terkait sementasi GIC 2. Mengapa harus mengambil cangkang keping bakau?? Apa keunggulannya?? Kenapa tdk dari sumber lainnya 3. Apakah hanya kekerasan sementasi GIC ada tidak sifat bahan dental material lainnya yg mau diteliti 4. Penyelidikan lebih lanjut diperlukan → peran hidroksi apatit belum jelas??? Tdk perlu statement ini 5. Jangan ada kata sambung di awal kalimat 6. Tujuan umum dan khusus lebih banyak lagi 7. GIC kandungan, kelebihan kekurangan, sifat material.. bukan penggunaan hidroksi apatit dlm bidang KG 8. Komposisi tepung cangkang keping bakau → mineral mineral lainnya 	<p style="text-align: center;">1</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> <p style="text-align: center;">6</p> <p style="text-align: center;">19</p>	

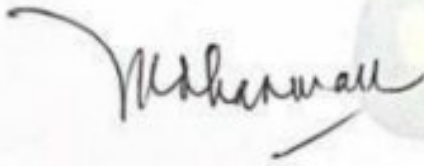
2.	drg. Eri H. Jubhari, M.kes, Sp.Pros (K).	<p>1. Perbaiki Redaksi kalimat, ada typo pada beberapa bagian ex: sistetesis</p> <p>2. Lebih besar mana Ukuran dan massa GIC dan bubuk serbuk cangkang ? Ukuran → hampir sama Massa → GIC lebih berat dibanding hidroksi apatit</p> <p>3. Pada prosesnya harus di kocok spy lebih homogen (petunjuk pemakaian harus lengkap)</p> <p>4. "total" pada table 1, tidak perlu (hapus)</p>	<p>5</p> <p>40</p> <p>Saran</p> <p>48</p>	
3.	drg. Irfan Dammar, Sp. Pros (K)	<p>1. Menambahkan sejumlah penelitian sebelumnya</p> <p>2. Skema pembahasan supaya lebih sistematis,</p> <p>3. Menyusun Hipotesis menggunakan kalimat deklaratif</p> <p>4. Mengetahui ambang batas penambahan konsentrasi ??</p> <p>5. Penambahan variable Uji antibakteri untuk cangkang keping</p> <p>6. Hasil uji normalitas dimasukkan dalam table</p>	<p>3,4,55</p> <p>50</p> <p>34</p> <p>35,40</p> <p>Saran</p> <p>48</p>	

Makassar, September 2022

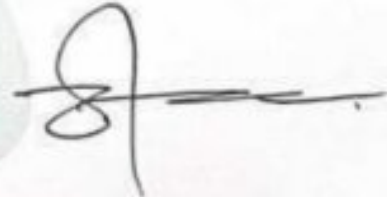
Mengetahui,

Pembimbing I

Pembimbing II



Prof. drg. Moh. Dharma Utama, Ph.D.,
Sp. Pros (K).




drg. Vinsensia Launardo, Sp. Pros (K)


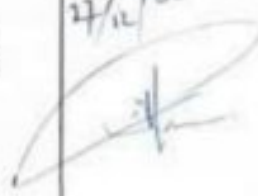
LEMBAR PERBAIKAN

KARYA TULIS AKHIR (KTA) / TESIS PROGRAM PENDIDIKAN DOKTER GIGI SPESIALIS (PPDGS) PROSTODONSIA

Nama Mahasiswa : R. Alfian Djamaludin

Stambuk : J015 201 002

No.	Tim Penguji	Catatan Perbaikan/ Saran	Halaman	Tanda Tangan
1.	DR. drg. Ike Damayanti Habar, Sp. Pros (K)	1. Alasan lebih memilih GIC konvensional?	1,7,8	
		2. Alasan memilih kadar 6%, 7%, 8% dan 9 %??	4	
		3. Krm nilai 5 nilainya tidak signifikan	4	
		4. Knp tdk > 10 % → dikhawatirkan akan mengurangi kekerasan (tapi belum di teliti)	4	
		5. Knp tidak dilakukan perbandingan GIC konvensional dengan GIC RMGIC dan GIC nano?	Saran	
		6. GIC konvensional sebagai variable control	35,40	
		7. Kerangka teori dikembangkan kerangka konsep (terbalik)	32,33	
		8. Komposisi keping bakau → harus lengkap	26,27	

2.	drg. Eri Hendra Jubhari, M.Kes, Sp.Pros(K)	<ol style="list-style-type: none"> 1. Apakah GIC luting yg ada saat ini tdk mengandung hidroksi apatit?? 2. Adakah referensi yg menjelaskan ttg ini? Apakah penelitian sebelumnya yang menggunakan cangkang kepiting? 3. Jangan sampai dengan menambah hidroksiapatit malah mengganggu keseimbangan komposisi dari GIC tipe luting ini 4. Apakah alat uji kekerasannya sudah sesuai untuk material GIC ini 5. Tujuan umum ingin membuat bahan semen?? Atau bahan tambahan?? 	<p style="text-align: center;">1</p> <p style="text-align: center;">23</p> <p style="text-align: center;">1</p>	
3	drg. Irfan Dammar, Sp. Pros (K)	<ol style="list-style-type: none"> 1. Apa yg menjadi kekurangan GIC ini sbg sementasi?? Sehingga penulis menjadi solusi melakukan penelitian ini. Apakah selama ini sementasi GIC kurang?? 2. Bahan sementasi faktor kekerasan apakah penting?? Karena kekerasan lebih ke restorasi Bahan sementasi → uji daya tarik, viskositas Syarat syarat semntasi yang bagus?? Sekarang lbh banyak sementasi dengan resin, minimal penambahan hidroksiapatit pada GIC sama dengan resin 3. Latar belakang harus kuat 	<p style="text-align: center;">1</p> <p style="text-align: center;">2</p> <p style="text-align: center;">1</p>	<p style="text-align: right;">27/12/22</p> 

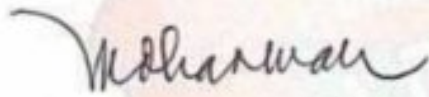
		GIC sebagai sementasi bukan restorasi 4. Judul jangan GIC nanti dikira merk. Tulis saja Glass ionomer cement		
--	--	-----------------------------------------------------------------------------------------------------------------	--	--

Makassar, Desember 2022

Mengetahui,

Pembimbing I

Pembimbing II



Prof. drg. Moh. Dharma Utama, Ph.D
Sp.Prof (K)



drg. Vinsensia Launardo, Sp.Prof(K)