S3 Appendix. The forest plots concerning redundant or nonstatistically significant results.

Maxillary/upper jaw changes

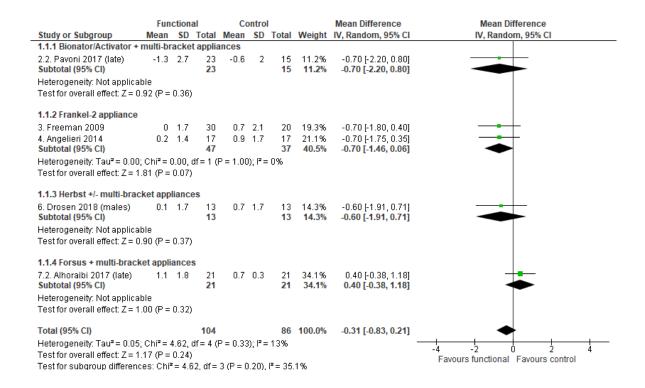


Figure 1. Meta-analysis; Outcome: SNA angle; Time point: above 18 years of age.

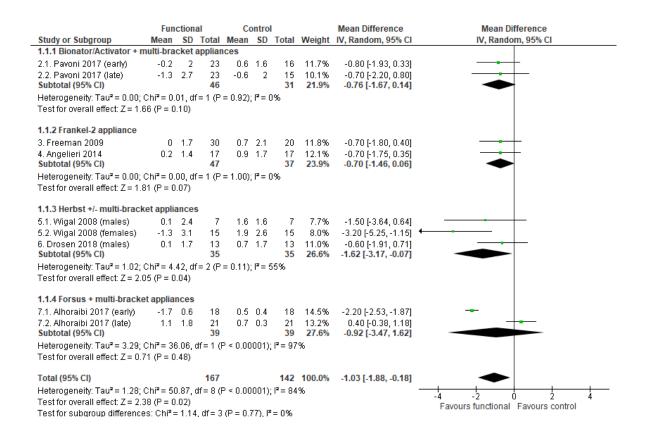


Figure 2. Meta-analysis; Outcome: SNA angle; Time point: After a post-retention period of at least 3 years.

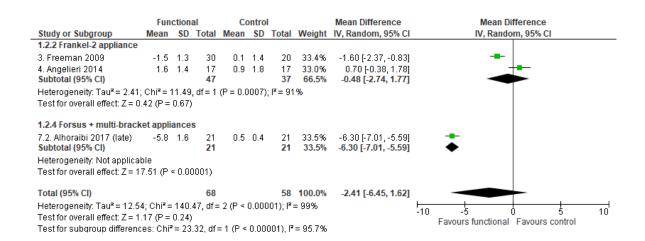


Figure 3. Meta-analysis; Outcome: A to N perpendicular distance; Time point: above 18 years of age.

	Fun	ction	al	Co	Control			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.2.2 Frankel-2 appli	iance								
3. Freeman 2009	-1.5	1.3	30	0.1	1.4	20	51.4%	-1.60 [-2.37, -0.83]	-
4. Angelieri 2014 Subtotal (95% CI)	1.6	1.4	17 47	0.9	1.8	17 37	48.6% 100.0%	0.70 [-0.38, 1.78] - 0.48 [-2.74, 1.77]	*
Heterogeneity: Tau ² : Test for overall effect				df = 1 (P	' = 0.1	J007); I	*= 91%		
Total (95% CI)			47			37	100.0%	-0.48 [-2.74, 1.77]	
Heterogeneity: Tau2:	= 2.41; C	hi² = 1	11.49, (df=1 (P	= 0.0	0007); I	²= 91%	H	10 -5 0 5 10
Test for overall effect	Z = 0.42	(P=	0.67)				-	10 -5 0 5 10 Favours functional Favours control	
Test for subgroup dit	fferences	: Not	applica	able				1 avours functional T avours control	

Figure 4. Meta-analysis; Outcome: A to N perpendicular distance; Time point: end of growth according to the CVM method.

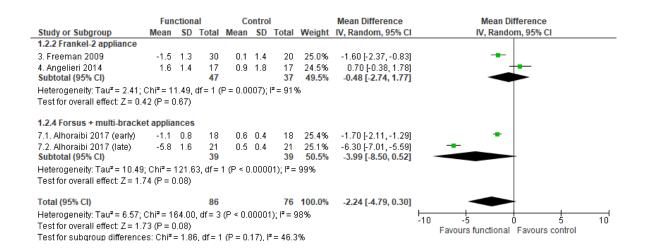


Figure 5. Meta-analysis; Outcome: A to N perpendicular distance; Time point: After a postretention period of at least 3 years.

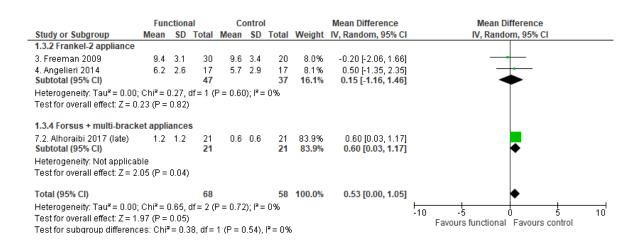


Figure 6. Meta-analysis; Outcome: Co-A distance; Time point: above 18 years of age.

F		ction	al	Co	ontro	I	Mean Difference		Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	
1.3.2 Frankel-2 appli	ance									
3. Freeman 2009	9.4	3.1	30	9.6	3.4	20	49.8%	-0.20 [-2.06, 1.66]	-	
4. Angelieri 2014	6.2	2.6	17	5.7	2.9	17	50.2%	0.50 [-1.35, 2.35]	_	
Subtotal (95% CI)			47			37	100.0%	0.15 [-1.16, 1.46]	•	
Heterogeneity: Tau ² :	= 0.00; CI	hi² = I	0.27, df	= 1 (P =	= 0.60	$0); I^2 = 0$	0%			
Test for overall effect	Z = 0.23	(P=	0.82)							
Total (95% CI)			47			37	100.0%	0.15 [-1.16, 1.46]	•	
Heterogeneity: Tau ² :	= 0.00; Cl	hi² = I	0.27, df	= 1 (P =	= 0.60	$0); I^2 = 0$	0%	H	40 + 40	
Test for overall effect	Z = 0.23	(P=	0.82)	-	10 -5 0 5 10 Favours functional Favours control					
Test for subgroup dif	ferences	: Not	applica		i avours iunctional. Lavours control					

Figure 7. Meta-analysis; Outcome: Co-A distance; Time point: end of growth according to the CVM method.

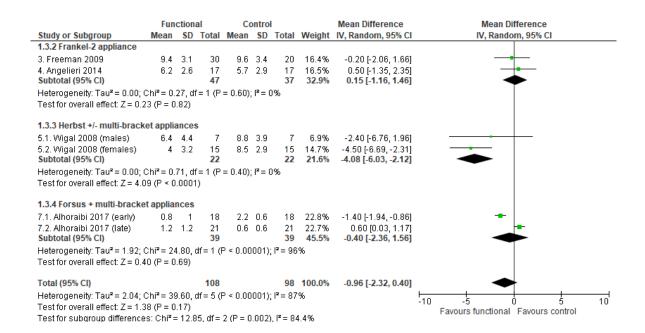


Figure 8. Meta-analysis; Outcome: Co-A distance; Time point: After a post-retention period of at least 3 years.

Mandibular/lower jaw changes

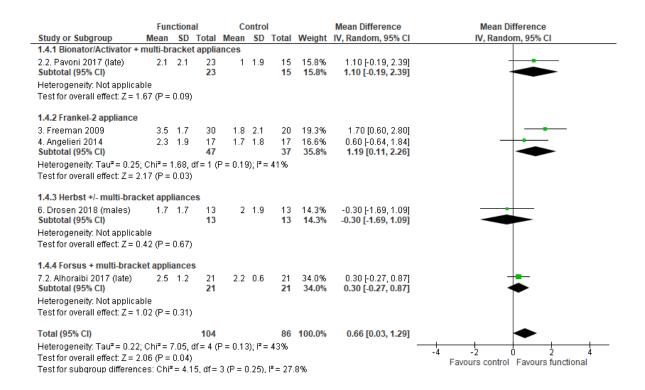


Figure 9. Meta-analysis; Outcome: SNB angle; Time point: above 18 years of age.

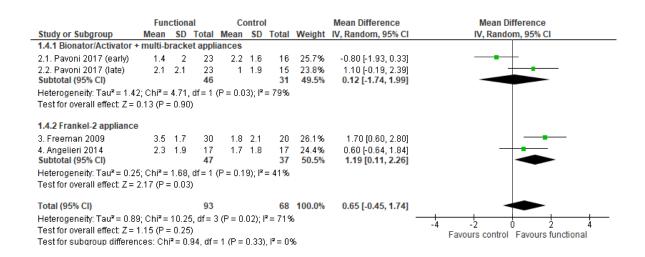


Figure 10. Meta-analysis; Outcome: SNB angle; Time point: end of growth according to the CVM method.

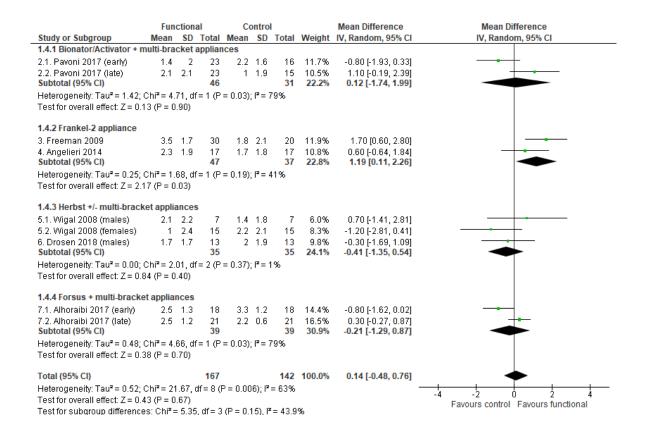


Figure 11. Meta-analysis; Outcome: SNB angle; Time point: After a post-retention period of at least 3 years.

	Functional			C	ontro	ı		Mean Difference	Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI			
1.5.1 Bionator/Activator + multi-bracket appliances												
2.2. Pavoni 2017 (late) Subtotal (95% CI)	6.3	2.1	23 23	3.4	3.1	15 15	23.4% 23.4%	2.90 [1.11, 4.69] 2.90 [1.11, 4.69]	•			
Heterogeneity: Not applica	ble											
Test for overall effect: Z = 3	.18 (P =	0.001))									
1.5.2 Frankel-2 appliance												
3. Freeman 2009	2.3	3.3	30	2.8	2.9	20	23.9%	-0.50 [-2.23, 1.23]				
4. Angelieri 2014 Subtotal (95% CI)	6.6	4	17 47	3.6	2.8	17 37	18.6% 42.5%	3.00 [0.68, 5.32] 1.16 [-2.26, 4.59]				
Heterogeneity: Tau² = 5.03	; Chi ² = 6	i.60, d	f= 1 (F	9 = 0.02	2); l² =	82%						
Test for overall effect: $Z = 0$.66 (P=	0.51)										
1.5.4 Forsus + multi-brack	cet applia	ances										
7.2. Alhoraibi 2017 (late) Subtotal (95% CI)	1.8	0.8	21 21	0.9	1.5	21 21	34.1% 34.1%	0.90 [0.17, 1.63] 0.90 [0.17, 1.63]	-			
Heterogeneity: Not applica Test for overall effect: Z = 2		0.02)										
	`	ĺ				70	400.00					
Total (95% CI)			91				100.0%	1.42 [0.01, 2.84]				
Heterogeneity: Tau ² = 1.39			df = 3 ().U = Y;	J2); I²	= 70%			-10 -5 0 5 10			
Test for overall effect: Z = 1 Test for subgroup difference			2 df= 1	2 (P = 1	1 1 3 \	2 <u> </u>	5%		Favours control Favours functional			
restroi subdituth dilletetit	,65. OIII	- 4.12	z, ul – .	2 (1 — (,,,,,,,	- 51.	.5 70					

Figure 12. Meta-analysis; Outcome: Pg to N perp distance; Time point: above 18 years of age.

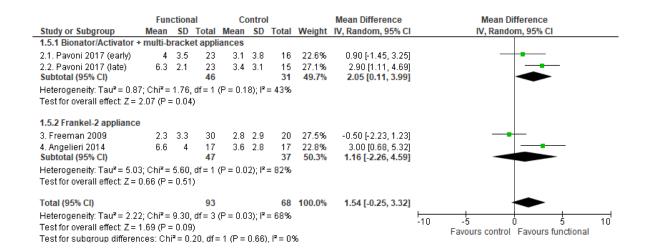


Figure 13. Meta-analysis; Outcome: Pg to N perp distance; Time point: end of growth according to the CVM method.

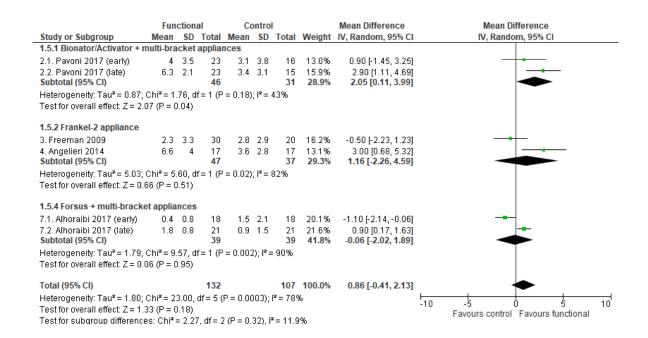


Figure 14. Meta-analysis; Outcome: Pg to N perpendicular distance; Time point: After a post-retention period of at least 3 years.

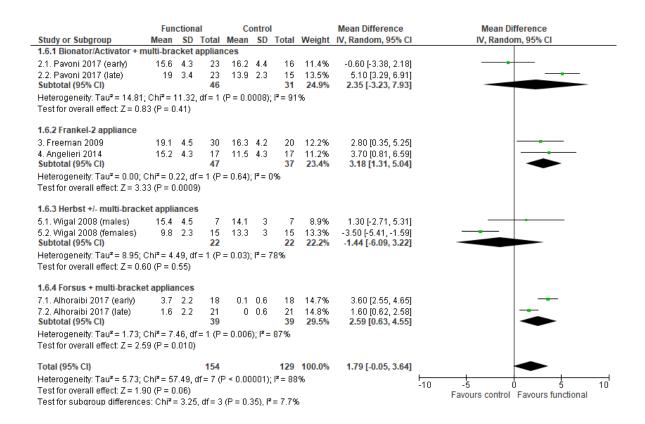


Figure 15. Meta-analysis; Outcome: Co-Gn distance; Time point: After a post-retention period of at least 3 years.

Maxillo-mandibular changes

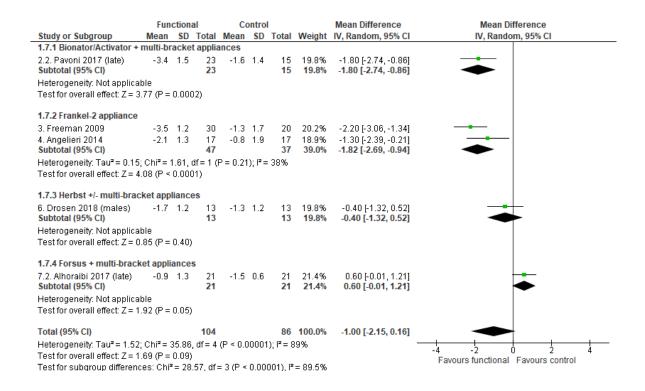


Figure 16. Meta-analysis; Outcome: ANB angle; Time point: above 18 years of age.

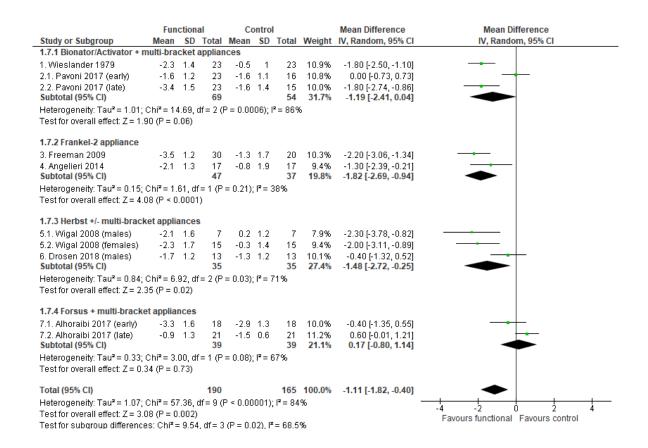


Figure 17. Meta-analysis; Outcome: ANB angle; Time point: After a post-retention period of at least 3 years.

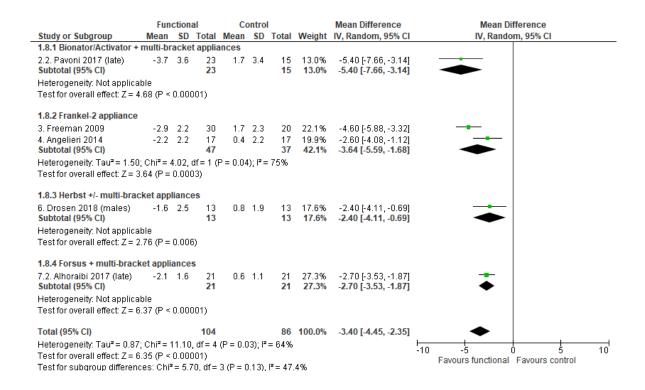


Figure 18. Meta-analysis; Outcome: Wits appraisal; Time point: above 18 years of age.

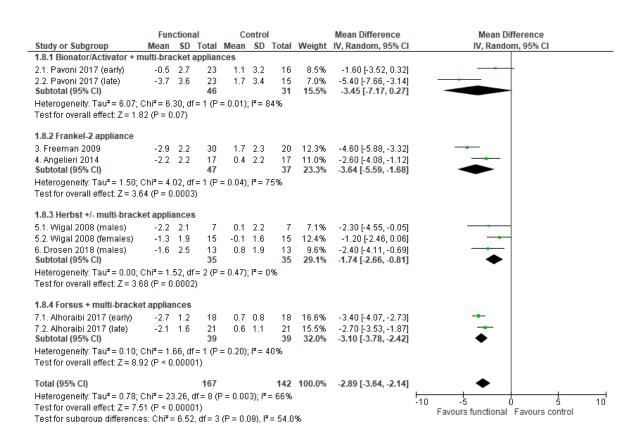


Figure 19. Meta-analysis; Outcome: Wits appraisal; Time point: After a post-retention period of at least 3 years.

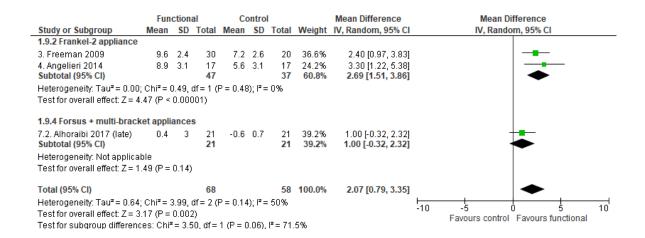


Figure 20. Meta-analysis; Outcome: Co-Gn/Co-A difference; Time point: above 18 years of age.

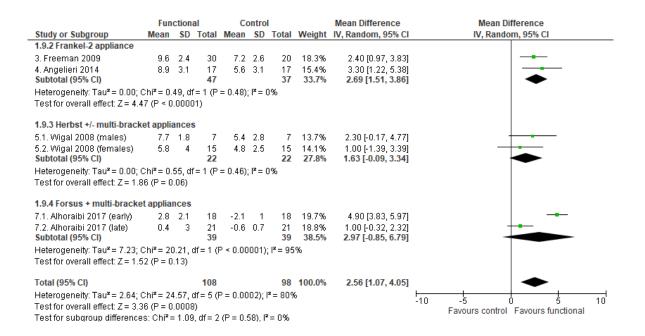


Figure 21. Meta-analysis; Outcome: Co-Gn/Co-A difference; Time point: After a post-retention period of at least 3 years.

Additional analysis

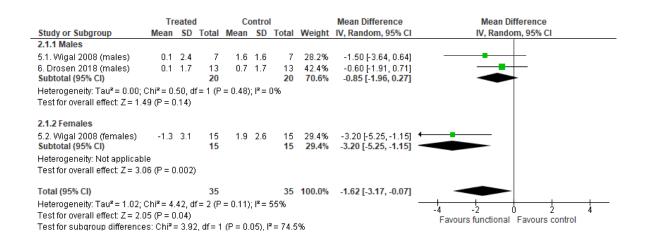


Figure 22. Subgroup analysis based on gender (males, females); Outcome: SNA angle.

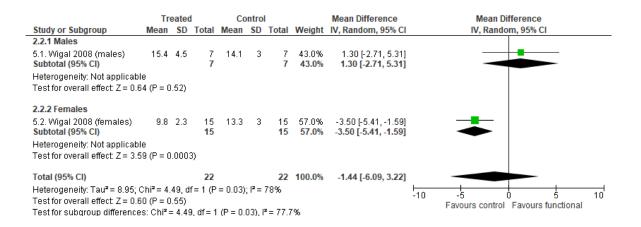


Figure 23. Subgroup analysis based on gender (males, females); Outcome: Co-Gn distance.

	Tre	eated		Co	ontrol	l		Mean Difference	Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI		
2.3.1 Males											
5.1. Wigal 2008 (males)	-2.1	1.6	7	0.2	1.2	7	28.2%	-2.30 [-3.78, -0.82]			
6. Drosen 2018 (males)	-1.7	1.2	13	-1.3	1.2	13	37.5%	-0.40 [-1.32, 0.52]			
Subtotal (95% CI)			20			20	65.8%	-1.26 [-3.11, 0.60]			
Heterogeneity: Tau ² = 1.41; ¹	$Chi^2 = 4.5$	55, df	= 1 (P	= 0.03)	; 2 = 1	78%					
Test for overall effect: Z = 1.3	33 (P = 0	.18)									
2.3.2 Females											
5.2. Wigal 2008 (females)	-2.3	1.7	15	-0.3	1.4	15					
Subtotal (95% CI)			15			15	34.2%	-2.00 [-3.11, -0.89]	-		
Heterogeneity: Not applicab	le										
Test for overall effect: Z = 3.52 (P = 0.0004)											
Total (95% CI)			35			35	100.0%	-1.48 [-2.72, -0.25]	-		
Heterogeneity: Tau ² = 0.84;	0hi² = 6.5	92. df	= 2 (P	= 0.03)	; ² = 1	71%					
Test for overall effect: Z = 2.3	35 (P = 0	.02)							-4 -2 U 2 4 Favours functional Favours control		
Test for subgroup difference	s: Chi²=	0.45	. df = 1	(P = 0.	50), P	= 0%			ravours functional ravours control		

Figure 24. Subgroup analysis based on gender (males, females); Outcome: ANB angle.

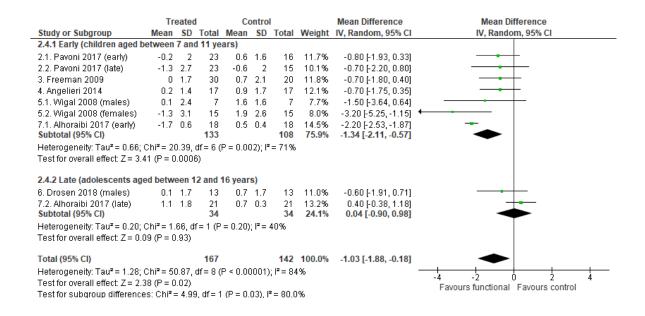


Figure 25. Subgroup analysis based on the beginning of the functional appliance therapy;

Outcome: SNA angle. Early treatments, commencing in children aged between 7 and 11 years; late treatments, beginning in adolescents aged between 12 and 16 years.

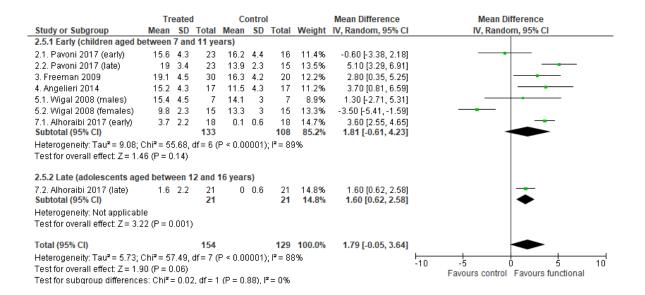


Figure 26. Subgroup analysis based on the beginning of the functional appliance therapy;

Outcome: Co-Gn distance. Early treatments, commencing in children aged between 7 and 11 years; late treatments, beginning in adolescents aged between 12 and 16 years.

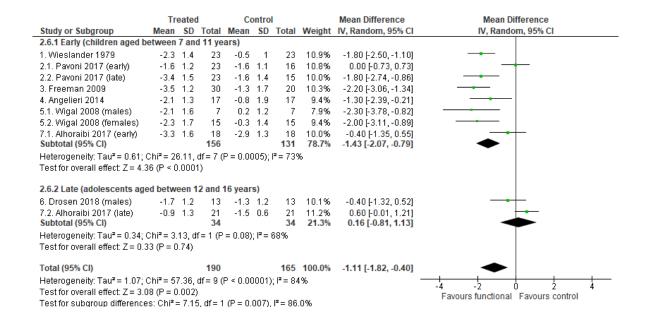


Figure 27. Subgroup analysis based on the beginning of the functional appliance therapy;

Outcome: ANB angle. Early treatments, commencing in children aged between 7 and 11 years; late treatments, beginning in adolescents aged between 12 and 16 years.

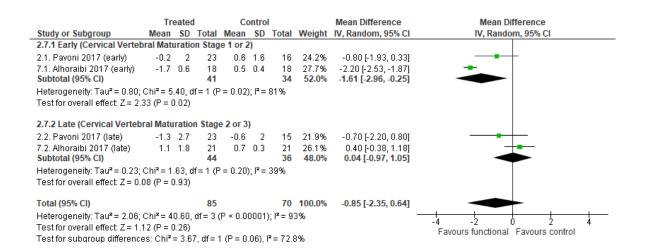


Figure 28. Subgroup analysis based on the start of the treatment; Outcome: SNA angle. Early treatments, with patients presenting with Cervical Vertebral Maturation Stage [CVMS] 1 or 2 at the first observation; late treatments, with subjects presenting with CVMS 2 or 3.

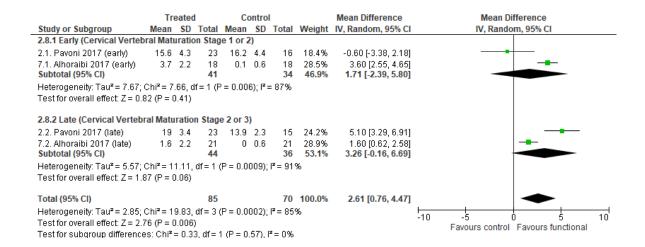


Figure 29. Subgroup analysis based on the start of the treatment; Outcome: Co-Gn distance.

Early treatments, with patients presenting with Cervical Vertebral Maturation Stage [CVMS] 1 or 2 at the first observation; late treatments, with subjects presenting with CVMS 2 or 3.

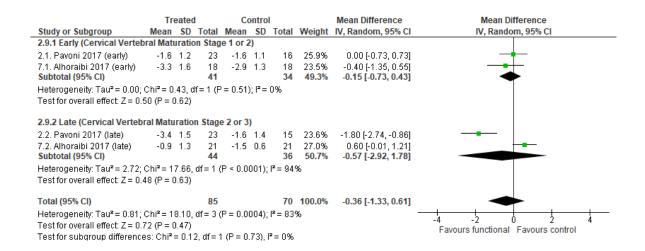


Figure 30. Subgroup analysis based on the start of the treatment; Outcome: ANB angle. Early treatments, with patients presenting with Cervical Vertebral Maturation Stage [CVMS] 1 or 2 at the first observation; late treatments, with subjects presenting with CVMS 2 or 3.

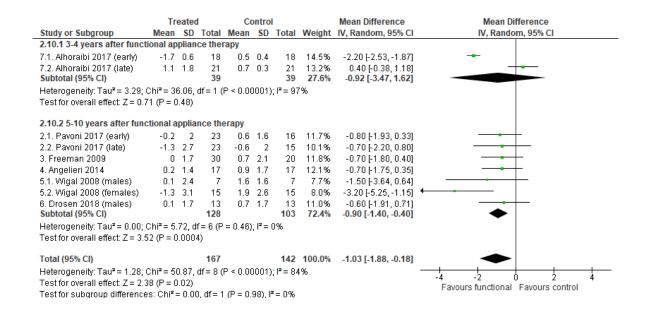


Figure 31. Subgroup analysis based on the post-retention period duration (3-4, 5-10 years after active treatment with functional appliances); Outcome: SNA angle.

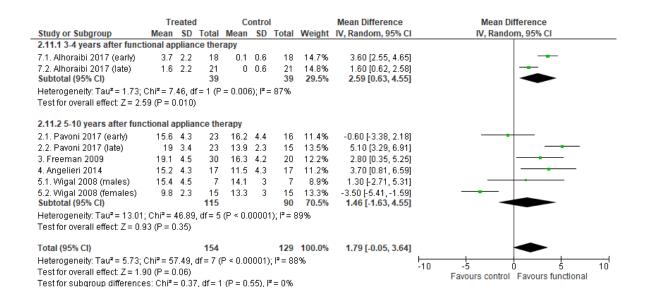


Figure 32. Subgroup analysis based on the post-retention period duration (3-4, 5-10 years after active treatment with functional appliances); Outcome: Co-Gn distance.

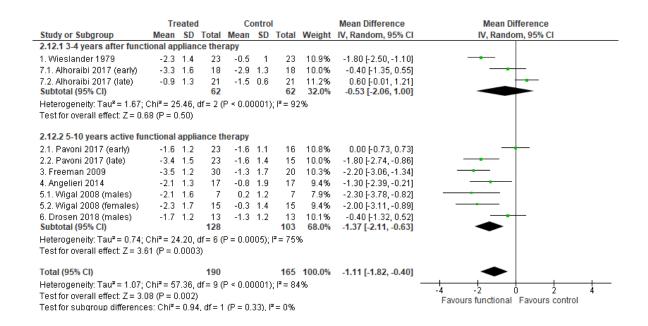


Figure 33. Subgroup analysis based on the post-retention period duration (3-4, 5-10 years after active treatment with functional appliances); Outcome: ANB angle.

Sensitivity analysis

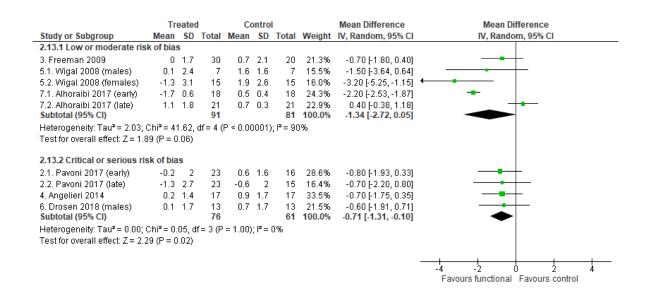


Figure 34. Sensitivity analysis based on the study quality assessment; Outcome: SNA angle.

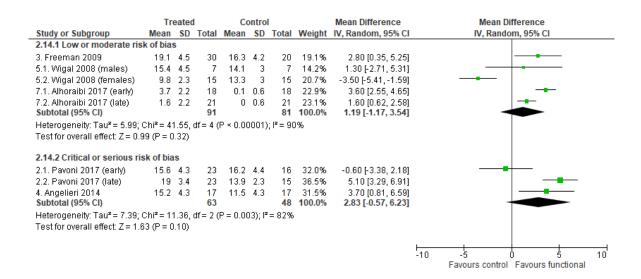


Figure 35. Sensitivity analysis based on the study quality assessment; Outcome: Co-Gn distance.

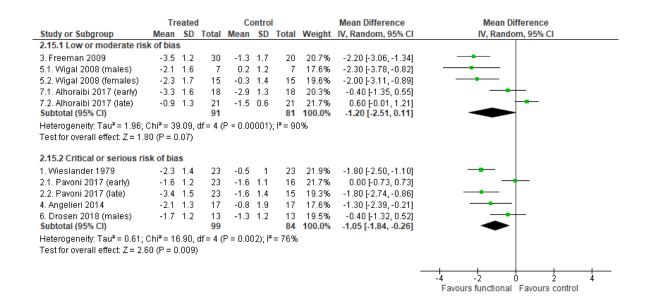


Figure 36. Sensitivity analysis based on the study quality assessment; Outcome: ANB angle.