



Supplemental Table S1. Summary of the included studies' findings about zirconia crowns for primary teeth and gingival and periodontal health.

Study	Assessment Method	Time of Evaluation	Results							Summary of Results	
Tara et al., 2018 [30]	PI: 0= None 1= Film at margins 2= Moderate 3= Abundance GI: 0= None 1= Mild 2= Moderate 3= Severe	At 1, 3, 6, 12 m	Median GI							There were significantly different GI scores among the C-ZC, SSC, and C-SSC groups at all evaluation time-points (C-ZC P=0.0003, SSC P=0.034, C-SSC P=0.004) respectively, no significant difference was found in ZC group (P=0.076). There was significant difference between the ZC and their controls in PI and GI scores at all evaluations times after baseline (P<0.05). Whereas in SSCs, there were no significant difference in PI scores at all evaluation times after baseline. However, the GI scores were all significantly different except at 1-month follow up (P<0.05).	
			Crown Type	Baseline	1 m	3 m	6 m	12 m	p-value		
			ZC	0.25	0.25	0.25	0.25	0.25	0.076		
			C-ZC	0.5	1	0.25	0.75	0.5	0.0003		
			SSC	0.5	1	0.75	1	1	0.034		
			C-SSC	0	0.25	0.25	0.5	0.5	0.004		
			Median PI								
			Crown Type	Baseline	1 m	3 m	6 m	12 m	p-value		
			ZC	0.25	0	0	0	0	0.18		
			C-ZC	0.5	0.75	0.5	0.75	0.75	0.124		
			SSC	0.5	0.5	1	1	1	0.257		
			C-SSC	0.25	0.75	0.5	0.5	0.5	0.55		
Walia et al., 2014 [27]	GI: 0= None 1= Mild 2= Moderate 3= Severe	At 6 m	Mean GI							The Results showed that at the 6-month follow up, the mean GI was increased in group RCSC and PVSSC, while it was significantly reduced (p=0.01) in ZZC. When comparing the differences mean GI between all groups, there was statistically significant differences between RCSC and ZZC and PVSSC and ZZC (p=0.00) only.	
						Baseline	6 m				
			Crown Type	n-Baseline	n-6m	Mean (SD)		Mean (SD)			
			RCSC	43	36	1.65 (0.50)		1.97 (0.44)			
			PVSSC	43	37	1.71 (0.50)		1.95 (0.61)			
			ZZC	43	38	1.67 (0.56)		1.35 (0.60)			

Holsing er et al., 2016 ^[44]	GI: 0= None 1= Mild 2= Moderate 3= Marked	(Retrospec- tive study) 2010 – 2014	Total number of teeth in each group (N) = 44					The results showed that (36%) of EZP showed a mild to moderate gingival inflammation.	
			Score	0	1	2	3		
			n (%)	28 (64)	14 (32)	2 (4)	0 (0)		
Mathew et al., 2020 ^[48]	GI: 0= None 1= Mild 2= Moderate 3= Severe PI: 0= None 1= Film at margins 2= Moderate 3= Large amount	At 3, 6, 9, and 12 m	Total number of teeth in each group (N) = 30					The results showed that KKZ reported a significantly lower GI and PI scores at all time-points compared to SSC (P<0.05).	
			Mean (SD)						
			Crown Type	3 m	6 m	9 m	12 m		
			PI KKZ	0.80 (0.1)	0.95 (0.1)	0.99 (0.1)	1.01 (0.1)		
			GI KKZ	0.80 (0.1)	1.12 (0.2)	1.47 (0.1)	1.76 (0.1)		
			PI SSC	1.48 (0.2)	1.75 (0.1)	1.92 (0.1)	2.41 (0.1)		
GI SSC	1.38 (0.1)	1.63 (0.2)	1.89 (0.1)	2.11 (0.3)					
Mathew et al., 2020 ^[49]	GI: 0= Healthy 1= Mild, involving some pa- pilla 2= Moderate, involving entire papilla 3= Severe PI 0= None 1= Film at margin 2= Moderate 3= Large amount	At 6, 12, 18, 24, and 36 m	Total number of teeth in each group (N) = 30					The results showed KKZ, and SSC showed no signs of inflammation both scored (100%) in GI. Whereas in PI, KKZ (100%) showed no signs of plaque accu- mulation as compared to SSC (P=0.047).	
			Crown Type	6m	12m	18m	24m		36m
			GI ZC (%)	100	100	100	100		100
			PI ZC (%)	100	100	100	100		100
			GI SSC (%)	100	100	100	100		100
			PI SSC (%)	100	80	80	87		100

Azab et al., ^[54]	GI	1 week, 1, 3, 6, 9, 12, 18, 24, and 36 m	Total number of teeth in each group (N) = 25								The results showed that there were no statistically significant differences between GI scores for both cements at different time-points.			
			(Median) GI											
			Cement type	Baseline	1 w		1 m		3 m			6 m		
			Bio-active cement	0.25	1.13		1.00		0.50			0.38		
			Packable GIC	0.25	1.00		0.50		0.25			0.38		
				9 m	12 m		18 m		24 m			36 m		
			Bio-active cement	0.50	0.25		0.25		0.50			0.25		
Packable GIC	0.50	0.50		0.38		0.50		0.50						
Donly et al., 2018 ^[55]	GI	At 6,12 and 24 m	Total number of teeth in each group (N)	6 m			12 m			24 m			The results showed that the gingival health appear to be better in NSZ as compared to SSC at 6-month follow up. However, Gingival health appear to be similar in both crowns at 2-year follow up. No crown score C at all evaluation time-points. There were no statistically significant differences (P<0.05) in the GI score for both crowns.	
				N=44			N=43			N=39				
				Score	0	1	2	0	1	2	0	1		2
				NSZ n	34	9	0	33	10	0	28	8		0
				SSC n	28	15	0	28	14	0	26	8		0
Hanafi et al., 2021 ^[56]	GI:	At 1, 3 and 6 m	Total number of (CAD/CAM) ZC (N) = 15										The results showed that CCZC had no changes in gingival appearance, bleeding or gingival recession, and there was improvement in oral health of	
			Total number of NSZ (N) = 16											
			GI											
						1m			3m			6m		
Score			0	1	2	0	1	2	0	1	2			

<div>3= Severe inflammation: a tendency toward spontaneous bleeding.</div> <div>PI</div> <div>0= None</div> <div>1= Film at margin</div> <div>2= Moderate</div> <div>3= Abundance amount</div> <div>BOP (four sites)</div> <div>0= No bleeding</div> <div>1= Bleeding</div>	<div>(CAD/CAM) ZC (n)</div>	0	12	3	0	14	1	0	15	0	<div>anterior crowns. However, there was no statistically significant difference between the two types of crowns at all follow-up phases.</div>
	NSZ (n)	0	16	0	0	15	0	0	15	0	
	Total number of (CAD/CAM) ZC (N) = 15										
	Total number of NSZ (N) = 16										
	PI										
	Score	0	1	2	3	0	1	2	3	0	
	(CAD/CAM) ZC (n)	13	0	2	0	15	0	0	0	15	
	NSZ (n)	0	1	15	0	15	0	0	0	15	
	Total number of (CAD/CAM) ZC (N) = 15										
	Total number of NSZ (N) = 16										
BOP											
Score	0	1	0	1	0	1	0	1	0		
(CAD/CAM) ZC (n)	0	48/60	0	37/60	0	40/60	0	48/60	0		
NSZ (n)	0	49/64	0	37/60	0	41/60	0	49/64	0		

<div>Alaki et al., 2020^[58]</div> <div>GI</div> <div>0= No gingival bleeding</div> <div>1= Bleeding with probe</div> <div>2= Spontaneous bleeding</div> <div>PI</div> <div>0= None</div> <div>1= Film at margin</div> <div>2= Moderate</div> <div>3= Abundance amount</div>	<div>At 3, 6 and 12 m</div>	Total number teeth in each group (N) = 60				<div>The results showed that the bleeding on probing was greater in RCSC compared to ZC after following up of 3 and 6 months with p-value of (p<0.006) and (p<0.001) respectively. In regards of PI, during 3 and 6 months of follow up the results showed that the teeth covered with ZC had less plaque accumulation compared to teeth covered with RCSC with p-value of (p<0.001) in both groups.</div>
		GI (assessed as BOP)				
		Crown type	3m	6m	12m	
		ZC n (%)	24 (40)	0 (100)	0 (100)	
		RCSC n (%)	40 (66.7)	28 (46.7)	0 (100)	
		Total number of teeth in each group (N) = 60				
PI						

Alaki et al., 2020 [58]

GI

0= No gingival bleeding

1= Bleeding with probe

2= Spontaneous bleeding

PI

0= None

1= Film at margin

2= Moderate

3= Abundance amount

At 3, 6 and 12 m

The results showed that the bleeding on probing was greater in RCSC compared to ZC after following up of 3 and 6 months with p-value of (p<0.006) and (p<0.001) respectively. In regards of PI, during 3 and 6 months of follow up the results showed that the teeth covered with ZC had less plaque accumulation compared to teeth covered with RCSC with p-value of (p<0.001) in both groups.

				Score	0	1	2	3	0	1	2	3					
				ZC n (%)	20 (33)	36 (60)	4 (7)	0	47 (80)	12 (20)	0	0	58 (100)	0	0	0	
				RCSC n (%)	4 (7)	44 (73)	12 (20)	0	24 (40)	36 (60)	0	0	48 (80)	12 (20)	0	0	
Gill et al., 2020 [38]	0= Healthy 1= Red and/or inflamed; no BOP 2= Spontaneous and excessive BOP	At 12 m	Total teeth number (N) =135													The results showed that NSZ had the highest rate (83%) of healthy gingival tissues when compared to RCSC and PVSSC.	
			Score	0		1		2		Missing n (%)							
			RCSC n (%)	27 (56)		17 (35)		1 (2)		3 (6)							
			PVSSC n (%)	36 (77)		11 (23)		0 (0)		0 (0)							
			NSZ n (%)	33 (83)		6 (15)		0 (0)		1 (3)							
			Total n (%)	96 (71)		34 (25)		1 (1)		4 (3)							
Sharma et al., 2021 [62]	GI 0= No obvious signs of inflammation 1= Mild marginal gingivitis 2= Moderate marginal gingivitis 3= Severe gingivitis, tissue is very swollen: spontaneous bleeding PI 0= None 1= Film at margin 2= Moderate 3= Abundance amount	At 12 m	Total number of RCSC (N) = 17 Total number of ZC (N) = 19 GI													The Results showed that ZCs group had less plaque accumulation and more gingival health than RCSC group. There was a significant increase of plaque accumulation and less gingival health at 12-month follow up in RCSC when compared to ZCs with significant level of (0.013) (0.012) respectively.	
			Score	0		1		2		Missing n (%)							
			RCSC n (%)	27 (56)		17 (35)		1 (2)		1 (2)							
			NSZ n (%)	33 (83)		6 (15)		0 (0)		0 (0)							
			Total number of RCSC (N) = 17 Total number of ZC (N) = 19 PI														
			Score	0		1		2		Missing n (%)							
			RCSC n (%)	1 (6)		9 (53)		7 (41)									
			NSZ n (%)	2 (11)		17 (89)		0									

Yanover et al., 2020 ^[63]	0= No obvious signs of inflammation 1= Mild marginal gingivitis 2= Moderate marginal gingivitis 3= Severe gingivitis, tissue is very swollen: spontaneous bleeding	At 6-10.4m, 12.5-17.9m, 18.4-33.8m	Total Number of ZC (N) =131					The results showed that (58%) in 76 teeth with mild gingivitis followed by (35%) in 46 teeth with normal healthy gingiva and 7% in 9 teeth with moderate marginal gingivitis. However, the results obtained that gingival health around all tested ZC was very similar at all intervals of follow up.		
			Score	0	1	2	3			
			n (%)	46 (35)	76 (58)	9 (7)	0 (0)			
Talekar et al. 2021 ^[64]	GI: 0= Normal gingiva 1= Mild inflammation with slight edema 2= inflammation with edema and BOP	At 12 and 18 m	GI					The results showed no significant difference between the GFRC and NZS crowns before 12 months period, however, significant differences were found between the tested periods 12 (P>0.05) and 18 months (P<0.001), respectively. The control group experienced severely poor gingival health, while none of the intervention groups experienced this for both periods.		
				12 m Total number of GFRC = 30 (%) Total number of NSZ= 31 (%)		18 m Total number of GFRC = 28 (%) Total number of NSZ= 30 (%)				
			Score	0	1	2	0		1	2
			GFRC n(%)	24 (80)	5 (17)	1 (3)	20 (71)		6 (22)	2 (7)
			NSZ n (%)	29 (93)	2 (7)	0 (0)	28 (93)		2 (7)	0 (0)
	PI 0= no plaque retention 1= mild or minimal plaque retention 2= Severe plaque retention		PI					The results showed that at all periods, GFRC crowns scored significant plaque retention (P<0.001). Furthermore, only 6% of the tested NSZ crowns were having plaque retention at minor levels after 18 months.		
				12 m Total number of GFRC = 30 (%) Total number of NSZ= 31 (%)		18 m Total number of GFRC = 28 (%) Total number of NSZ= 30 (%)				
			Score	0	1	2	0		1	2
			GFRC n (%)	10 (33)	12 (40)	8 (27)	8 (29)		11 (39)	9 (32)
			NSZ n (%)	30 (97)	1 (3)	0 (0)	28 (94)		2 (6)	0 (0)

PI, Plaque index; GI, Gingival index; ZC, Zirconia crown; C-ZC, Controls for zirconia crowns; SSC, Stainless steel crown; C-SSC, Controls for stainless steel crown; RCSC, Resin composite strip crown; PVSSC, Preveneerd stainless steel crown; ZZC, Zirkiz zirconia crown; EZP, EZ Pedro crown; KKZ, Kinder Krown Zirconia; GIC, Glass ionomer cement; CAD/CAM ZC, Computer-aided manufacturing/Computer-aided modeling zirconia crown; NSZ, NuSmile Zirconia crown; BOP, Bleeding on probing.

Supplemental Table S2. Summary of the included studies' findings about parental satisfaction with zirconia crowns for primary teeth.

Study	Assessed Outcome	Assessment Method	Results							Summary of Results
Holsinger et al., 2016 ^[44]	1) Parental satisfaction ratings of esthetic characteristics of EZIP primary anterior ZCs.	Mean Likert scale rating from 1 (not at all) - 5 (very much)	Characteristics of EZIP			Total number of EZIP =54				The results showed that the mean over-all satisfaction is 4.6 on a five-point scale. No parents were dissatisfied with the durability, shape, or size of the crowns; one parent reported being dissatisfied with the color of the crowns. Parent's feedback indicated that EZIP improved the oral health (83%) and appearance (78%) of their children. Moreover, majority of the parents (83%) indicated that their children did not avoid smiling before treatment.
			Score	1	2	3	4	5	Mean	
			Size: n (%)	0 (0)	0 (0)	1 (6)	7 (39)	10 (55)	4.5	
			Shape: n (%)	0 (0)	0 (0)	3 (17)	4 (22)	11 (61)	4.4	
	Color: n (%)		0 (0)	0 (0)	1 (6)	5 (28)	12 (67)	4.6		
	Parental ratings of the impact of treatment on their children with EZIP									
	Score		1	2	3	4	5	Mean		
	Oral health of child improved after crowns: n (%)		0 (0)	1 (6)	0 (0)	2(11)	15(83)	4.7		
	Parents concern about appearance before the crowns: n (%)		2 (11)	0 (0)	2 (11)	5 (28)	9 (50)	4.1		
	Child avoided smiling before crowns: n (%)		15 (83)	0 (0)	2 (11)	1 (6)	0 (0)	1.4		
	Child smiled after crowns: n (%)		1 (5.5)	0 (0)	5 (28)	1 (5.5)	11 (61)	4.2		
Crowns improved appearance of the child's teeth: n (%)	0 (0)	0 (0)	1 (6)	3 (16)	14 (78)	4.7				
1) Parental acceptance		Total number of teeth in each group (N)=43								

Salami et al., 2015 [21]	2) Future treatment choice	Likert scale rating of satisfaction from 1 (very unsatisfied) - 5 (very satisfied)	Parental Acceptance		RCSC	PVSSC	ZZC	The results showed that ZZC (4.6) scored high overall satisfaction levels than RCSCs (4.0) and PVSSCs (3.8). A significant relationship was found between color of PVSSC ($p=0.003$) and durability of RCSC ($p=0.009$). Moreover, all parents (100%) who chose ZZCs for their children would choose to treat them again with the same crowns.
			Size: Mean		4.3	4	4.2	
			Color: Mean		4.3	3	4.1	
			Shape: Mean		4.2	4	4.3	
			Durability: Mean		3.1	3.9	4.7	
			Overall Satisfaction: Mean		4	3.8	4.6	
			Pain and Discomfort: Mean		2.2	1.65	1.95	
			Future Treatment Choice		RCSC	PVSSC	ZZC	
			Yes: n (%)		10 (77)	10 (83)	13 (100)	
			No: n (%)		3 (23)	2 (17)	0 (0)	
Vaishali et al., 2019 [46]	Esthetic acceptability of treatment for anterior teeth with deep caries.	A questionnaire	Total number of participants = 125					The results showed that among both children and their parents ZCs was the most acceptable treatment (65% and 76%) respectively, when used as full-coverage restoration for primary anterior teeth.
			Esthetic acceptability of treatment for anterior teeth with deep caries		Child	Mother	Father	
			No treatment: (%)		6	3	4	
			PVSSC: (%)		13	9	8	
			RCSC: (%)		16	12	10	
			ZC: (%)		65	76	78	
Pani et al., 2016 [47]	Esthetic acceptability of treatment for anterior teeth with deep caries.	A questionnaire	Total number of participants = 125					The results showed that there was no significant difference between parents and their children in the acceptability of any of the treatment modalities ex-
			Esthetic acceptability of treatment for anterior teeth with deep caries		Child	Mother	Father	
			No treatment: n (%)		5 (4.7)	5 (4.7)	4 (4.3)	
			PVSSC: n (%)		11 (10.3)	5 (4.7)	4 (3.7)	

			RCSC: n (%)	19 (17.8)		20 (18.7)		16 (18.7)		cept for PVSSC, which were significantly more acceptable to children than their parents.
			ZC: n (%)	75 (70.1)		87 (81.3)		85 (79.4)		
Mathew et al., 2020 ^[49]	Parental satisfaction	Likert type scale from 1 (very unsatisfied) - 5 (very satisfied)	Comparison of parental satisfaction of SSC and zirconia (%)							The results showed that only 12 parents (40%) were satisfied with the color of SSCs, whereas with ZCs, all parents (100%) were satisfied with color. A significant statistical difference (P<0.001) was present between both groups. Moreover, all patients (100%) were satisfied with ZCs, but only 16 of the patients (53.3) were satisfied with SSCs. A significant statistical difference (P<0.001) was seen between both groups.
			Total number of teeth in each group (N)=30							
			ZC	6 m	12 m	18 m	24 m	36 m		
			Color	100	100	100	100	100		
			Shape	100	100	100	100	100		
			Size	100	100	100	100	100		
			Retention	100	100	100	100	100		
			Durability	100	100	100	100	100		
			Overall satisfaction	100	100	100	100	100		
			Child satisfaction	100	100	100	100	100		
			SSC							
			Color	40	40	40	40	40		
			Shape	100	100	100	100	100		
			Size	100	100	100	100	100		
			Retention	100	100	100	100	100		
			Durability	100	100	100	100	100		
			Overall satisfaction	100	100	100	100	100		
			Child satisfaction	53.3	53.3	53.3	53.3	53.3		
Gill et al., 2020 ^[38]	Parental satisfaction	A questionnaire	-							The results showed that NSZ had the highest parental esthetic satisfaction when compared to RCSC and PVSSC.
1: Highly satisfied			Parents Satisfaction							

Talekar et al. 2021 [64]	2: Neutral 3= Strongly dissatisfied	A questionnaire at two periods: 12 m and 18 m		12 m Total number of GFRC = 30 (%) Total number of NSZ= 31 (%)			18 m Total number of GFRC = 28 (%) Total number of NSZ= 30 (%)			The results showed that among all 31 NSZ, 87% were satisfied for both periods. Almost half of FIGARO (57%) were satisfied at 12 m. The percentage of not satisfied parents increased to 32% at 18 m period with significant differences between both crowns in all periods 12 months (P=0.02) and 18 months (P<0.001).
			Score	1	2	3	1	2	3	
			GFRC n (%)	19 (57)	8 (34)	3 (9)	17 (68)	0 (0)	11 (32)	
			NSZ n (%)	29 (87)	0 (0)	2 (13)	28 (87)	0 (0)	2 (13)	
Yanover et al., 2021[66]	Parental satisfaction	A questionnaire	-							The results showed that all the tested esthetic crowns have higher parental satisfaction in all aspects; color match, crown contour and crown durability.

EZP, EZ Pedo crown; ZC, Zirconia crown; RCSC, Resin composite strip crown; PVSSC, Preveenerd stainless steel crown; ZCC, Zirkiz zirconia crown; SSC, Stainless steel crown; NSZ, NuSmile Zirconia crown; GFRC, Glass fiber-reinforced composite crown - Figaro Crowns.

Supplemental Table S3. Summary of the included studies' findings about the color stability of zirconia crowns for primary teeth.

Study	Assessment Score	Time of Evaluation	Results				Summary of Results
Taran et al., 2018 [30]	0=No staining	At 1,3,6 and 12 m	Total number of NSZ= 15				The results showed Minor staining was detected in only one NSZ.
	1=Minor staining			Score 0	Score 1 at 3 m	Score 2	
	2=Noticeable staining		n (%)	14 (93)	1 (7)	0 (0)	
Holsinger et al., 2016 [44]	0= No noticeable difference from adjacent teeth	2010 – 2014 (Not specified)	Total number of EZP= 44				The results showed Shade mismatch was reported in 36% of EZP.
	1= Slight shade mismatch		Score	0	1	2	
	2= Obvious shade mismatch		n (%)	28 (64)	14 (32)	2 (4)	

Mathew et al., 2020 ^[49]	0=No staining	At 6, 12, 24 and 36 m	Total number of teeth in each group (N) =30								The results showed that Both SSC and KKZ reported a successful clinical outcome of 100% with no staining.		
	1=Minor staining			Score 0-6 m		Score 0- 12 m		Score 0-24 m		Score 0-36 m			
	2=Noticeable staining		SSC: n (%)	30 (100)		30 (100)		30 (100)		30 (100)			
	KKZ: n (%)		30 (100)		30 (100)		30 (100)		30 (100)				
Donly et al., 2018 ^[55]	Color match (only for ZC):	At 6,12 and 24 m	Total number of teeth in each group (N) =43									The results showed that there was no statistically significant difference (p<0.05) in the clinical performance (stain resistance, color match and marginal discoloration) at all time-points (6, 12 and 24 months).	
	0= No mismatch			6 m			12 m			24 m			
	1= Acceptable with a color mismatch		Score	0	1	2	0	1	2	0	1		2
	2= Unacceptable with a color mismatch		Color match NSZ: n (%)	33 (77)	10 (23)	0 (0)	29 (67)	14 (33)	0 (0)	17 (44)	19 (56)		0 (0)
	Staining:		Staining NSZ: n (%)	27 (63)	16 (37)	0 (0)	31 (72)	12 (28)	0 (0)	29 (74)	7 (18)		0 (0)
	0= No staining		Staining SSC: n (%)	43 (100)	0 (0)	0 (0)	39 (90)	2 (10)	0 (0)	31 (79)	1 (2.5)		0 (0)
	1= Staining that could be polished away		Marginal discoloration NSZ: n (%)	43 (100)	0 (0)	0 (0)	43 (100)	0 (0)	0 (0)	36 (92)	0 (0)		0 (0)
	2= Heavy staining that could not be polished away		Marginal discoloration SSC: n (%)	43 (100)	0 (0)	0 (0)	42 (98)	0 (0)	0 (0)	34 (87)	0 (0)		0 (0)
	Marginal discoloration:												
Padmanabh et al., 2021 ^[57]	Color change:	NA	Total number of teeth in each group (N) = 20								The results showed that there was no change of the color after sterilization between different types of crowns, in both control and experimental groups.		
	0= No change		Score	0				1					
	1= change in color		PVSSC n (%)	20 (100)				0					
			SSC n (%)	20 (100)				0					
			ZC n (%)	20 (100)				0					
Gill et al., 2020 ^[38]		At 12 m	Total number of teeth = 135								The results showed that (98%) of ZCs completely matched or were		
			Score	0		1		2		Missing n (%)			

	0= Matches completely or within range of shade and translucency 1= Outside range for yellow, yellow/ brown, or grey discoloration 2= Outside range for reason other than yellowing or gray-ing		RCSC n (%)	21 (44)	23 (48)	3 (6)	1 (2)	within the range of shade and translucency due to the highly polished surface of ZCs which can prevent staining and accumulation of plaque from changing the color.	
			PVSSC n (%)	47 (100)	0 (0)	0 (0)	0 (0)		
			NSZ n (%)	39 (98)	0 (0)	0 (0)	1 (2)		
			Total n (%)	107 (79)	23 (17)	3 (2)	2 (2)		
Sharma et al., 2021 ^[62]	0= No noticeable difference from adjacent teeth 1= Slight shade mismatch 2= Obvious shade mismatch	At 12 m	Total number of RCSC =17 Total number of ZC =19					The results showed that (68.4%) of ZCs had no noticeable change in color when compared to RCSC and After 12 months of follow up but not statistically significant difference (0.168).	
			Score	0		1	2		
			RCSC n (%)	6 (35)		9 (52.9)	2 (11.7)		
			NSZ n (%)	13 (68.4)		5 (26.3)	1 (5.2)		
Yanover et al., 2020 ^[63]	0= No noticeable difference from adjacent teeth 1= Slight shade mismatch 2= Obvious shade mismatch	At 6-10.4m 12.5-17.9m 18.4-33.8m	Total Number of ZC=131					The results showed that 47 teeth (36%) scored (0), and 79 teeth (60%) scored (1), and only 5 teeth (4%) scored (2).	
			Score	0		1	2		
			n(%)	47(36)		79(60)	5(4)		
Talekar et al. 2021 ^[64]	Stain resistance 0: No staining 1: Mild staining could be polished 2= heavy staining cannot be polished	At 12 m and 18 m		At 12 m Total number of GFRC = 30 (%) Total number of NSZ= 31 (%)			At 18 m Total number of GFRC = 28 (%) Total number of NSZ= 30 (%)		The results no staining in NSZ crown in both periods. On the other hand, 73% of the GFRC group had mild to heavy staining in the first 12 m period, this percentage increased to 86% at 18 m period. Significant differences of (P <0.001)
			Score	0	1	2	0	1	

Color match 0= No noticeable difference from adjacent teeth 1= Slight shade mismatch 2= Obvious shade mismatch	Upon crown selection	GFRC n(%)	8 (27)	12 (40)	10 (33)	4 (14)	14 (50)	10 (36)	between both groups at the two periods.
		NSZ n (%)	31 (100)	0 (0)	0 (0)	30 (100)	0 (0)	0 (0)	
			Total number of GFRC = 33 (%) Total number of NSZ= 33 (%)						
		Score	0		1		2		All the NSZ were matched the natural color of the adjacent teeth and half of the GFRC had a notable mismatching of the color.
		GFRC n(%)	19 (58)		11 (33)		3 (9)		
		NSZ n (%)	30 (100)		0		0		

Abbreviations: NSZ, NuSmile Zirconia crown; EZP, EZ Pedo crown; SSC, Stainless steel crown; KKZ, Kinder Krown Zirconia crown; ZC, Zirconia crown; PVSSC, Preveneerd stainless steel crown; RCSC, Resin composite strip crown; NA, Not Applicable; GFRC, Glass fiber-reinforced composite crown - Figaro Crowns; DCR, Direct composite restoration.

Supplemental Table S4. Summary of the included studies' findings about the retention of zirconia crowns for primary teeth.

Study	Assessment Score/Method	Time of Evaluation	Results					Summary of Results
Taran et al., 2018 [30]	0= Present (Retained)	At 1, 3, 6 and 12 m	Total number of teeth in each group (N)=15					The results showed that SSC had a higher retention rate than NSZ.
	1= Absent (Lost)			Score 0	Score 1			
			NSZ: n (%)	13 (87)	2 (13)			
			SSC: n (%)	15 (100)	0 (0)			
Walia et al., 2014 [27]	0= Normal	At 6 m	Total number of RCSC =36					The results showed that ZCC reported a higher retention rate than RCSC and PVSSC crowns. There was a statistically significant difference between RCSC and PVSSC (p=0.04)
	1= Small but noticeable area of loss of material		Total number of PVSSC =37					
	2= Large loss of material		Total number of ZCC =38					
	3= Complete loss			Score 0	Score 1	Score 2	Score 3	
			RCSC: n (%)	28 (78)	2 (5)	0 (0)	6 (17)	
			PVSSC: n (%)	35 (95)	2 (5)	0 (0)	0 (0)	

			ZZC: n (%)	38 (100)	0 (0)	0 (0)	0 (0)	and between RCSC and ZZC (p=0.02).
Holsinger et al., 2016 ^[44]	0= Intact 1= Chipped/small but noticeable area of loss of material 2= Large loss of material 3 = Complete loss	(Retrospective study) 2010 – 2014	Total number of EZP = 46					The results showed that 96% of EZP were retained and only 4% were lost.
				Score 0	Score 1	Score 2	Score 3	
			n (%)	44 (96)	0 (0)	0 (0)	2 (4)	
Jing et al., 2019 ^[45]	Universal testing machine	NA	Total number of SEC = 46					The result showed that there were significantly lower MPa between the 1 mm group and the rest of groups 2,3 and 4mm (P<0.001). There were no significant differences in MPa among the 2,3 and 4mm groups (P>0.05) and there was no difference in retention between the TC and NTC.
			OCH Mean	1 mm TC	2 mm TC	3 mm TC	4 mm TC	
			Mean (Newtons)	116.0	251.4	319.3	431.5	
			Mean (MPa)	1.7	2.9	3.1	3.3	
			SD	1.0	1.4	0.7	0.6	
			Range (MPa)	2.9	4.3	2.1	2.3	
Mathew et al., 2020 ^[49]	0= Present (Retained) 1= Absent (Lost)	At 6, 12, 24, and 36 m	Total number of teeth in each group (N)=30					The results showed that Both SSC and KKZ reported a 100% retention.
				Score 0-6 m	Score 0-12 m	Score 0-24 m	Score 0-36 m	
			SSC: n (%)	30 (100)	30 (100)	30 (100)	30 (100)	
			KKZ: n (%)	30 (100)	30 (100)	30 (100)	30 (100)	
Azab et al., ^[54]	By visual inspection and probe to detect debonded crowns	At 1 week, 1, 3, 6, 9, 12, 18, 24, and 36 m	Retained Crowns					The results showed that there were statistically significant more retained and less debonded crowns for packable GI group compared to bio-
			Cement type	N=25 1 w	N=24 1 m	N=22 3 m	N=21 6 m	
			Bio-active cement	23 (92)	19 (79)	13 (62)	10 (48)	

			Packable GIC	24 (96)	23 (95)	21 (95)	20 (95)	20 (95)	active cement group at 3–36-month follow-ups.							
				N=21 12 m	N=21 18 m	N=21 24 m	N=19 (Bioactive Cement) N=17 (Packable GIC) 36 m									
			Bioactive cement	7 (33.3)	7 (33.3)	7 (33.3)	4 (21)									
			Packable GIC	20 (95)	20 (95)	20 (95)	14 (82)									
Al Shahawy et al., 2016 ^[37]	Clinically and radiographically	At 3, 6, 12, 18 and 24 m	Total number of NSZ =86							The results showed that (91%) of NSZ were retained and only (9%) dislodged after 24-months. The overall survival of the restorations was 95.3% after 12 months and 80.2% after 24 months.						
				3 m	6 m	12 m	18 m	24 m								
			n (%)	86 (100)	85 (98)	77 (96)	68 (92)	61 (91)								
Gill et al., 2020 ^[38]	0= Intact 1= Partially missing 2= Missing-some cement remaining on both tooth and crown interior	At 12 m	Total number of teeth = 135							The results showed that (95%) of NSZ were intact after 12 months follow up.						
			Score	0		1		2			Missing n (%)					
			RCSC n (%)	38 (79)		6 (13)		3 (6)			1 (2)					
			PVSSC n (%)	47 (100)		0 (0)		0 (0)			0 (0)					
			NSZ n (%)	38 (95)		1 (3)		0 (0)			1 (3)					
			Total n (%)	123 (91)		7 (5)		3 (2)			2 (2)					
Alaki et al., 2020 ^[58]	0= Crown appears normal 1= Small but noticeable area of loss of material 2= Large loss of crown material	At 3, 6 and 12 m	Total number of teeth in each group (N) =60											The results showed that there were no crown failures up to 3 months follow up in both groups, in ZC group 2 crowns had lost due to trauma in 6 and 12 follow up, while failure was noticed more in RCSC group in both		
				3m				6m				12m				
			Score	0	1	2	3	0	1	2	3	0	1		2	3
			RCSC n (%)	60 (100)	0	0	0	52 (87)	7 (12)	1 (1)	0	37 (62)	18 (30)		5 (8)	0

	3= Complete loss of crown	ZC n (%)	60 (100)	0	0	0	59 (98)	0	0	1 (2)	58 (98)	0	0	1 (2)	intervals of follow up 6 and 12 months.	
Alhissan et al., 2021 ^[59]	0= No clinical failure At 24 m 1= Debonding without complications 2= Debonding with complications 3= Failure without debonding	Total number of ZC =70													The results showed that out of the 70 ZCs studied over 24 months, 14 crowns had failed, giving an overall success rate of 80%. The success rate of crowns with pulp treatment was significantly lower (76%) than crowns without pulp treatment (90%).	
		Score			With pulp therapy				Without pulp therapy							
		0			18				38							
		1			2				8							
		2			0				3							
		3			0				1							
		Total			20				50							
Sharma et al., 2021 ^[62]	0= Crown appears normal: 1= Small but noticeable area of loss of material 2= Large loss of crown material 3= Complete loss of crown	Total number of RCSC =19													The results showed that restoration failure was significantly higher in RCSC group when compared to ZCs with significant level of (0.0001).	
		Total number of ZC =20														
		Score		0		1		2		3						
		RCSC n (%)		5 (26.3)		11 (57.8)		1 (5.2)		2 (10.5)						
		ZC n (%)		19 (95)		0		0		1 (5)						
Talekar et al. 2021 ^[64]	0= Intact or present At 12 m and 18 m 1= Chipped / loss of material 2= Complete loss of the crown.			At 12 m Total number of GFRC = 33 (%) Total number of NSZ= 33 (%)				At 18 m Total number of GFRC = 29 (%) Total number of NSZ= 30 (%)				The results showed a significant difference (P<0.05) between the two periods. Only two of the NSZ crowns were dislodged at 12 m period with no chipping or more additional losses later. Half of GFRC crowns were damaged and the losses were double of NSZ at 18 m period.				
		Score		0		1		2		0			1		2	
		GFRC n (%)		23 (70)		7 (21)		3 (9)		15 (52)			13 (45)		1 (3)	
		NSZ n (%)		31 (94)		0 (0)		2 (6)		30 (100)			0		0	

Walia et al 2021 ^[67]	Universal testing machine	NA	Total number of each group (N)= 24					The results showed that all the es- thetic tested crowns have better re- tention with BioCem and FujiCEM® 2 with no significant difference be- tween them. However, the Ketac Cem Maxicap cement was signifi- cantly lower and less retentive (P= 0.002).
			Cement type	NSZ	CCZ	SEC	KKZ	
			BioCem: n (SD)	112 (17)	110 (15)	130 (23)	117 (22)	
			FujiCEM®: n (SD)	106 (14)	129 (25)	111 (17)	114 (21)	
			Ketac Cem Maxicap: n (SD)	44 (10)	31 (10)	27 (12)	20 (9)	

Abbreviation: MPa, Megapascal; OCH, Occluso-cervical heights; TC, Thermocycling; NTC, Non-thermocycling “control group”; SD, Standard deviation; SSC, Stainless steel crown; KKZ, Kinder Krown Zirconia crown; GIC, Glass ionomer cement; RCSC, Resin composite strip crown; PVSSC, Preveneerd stainless steel crown; NSZ, NuSmile Zirconia crown; EZP, EZ Pedo crown; ZZC, Zirkiz zirconia crown; GFRC, Glass fiber-reinforced composite crown-Figaro Crowns.

Supplemental Table S5. Summary of the included studies’ findings about the fracture resistance of zirconia crowns for primary teeth.

Study	Assessment Score/Method	Time of Evaluation	Results				Summary of Results
Tara et al., 2018 ^[30]	0= Intact	At 1, 3, 6 and 12 m.	Total number of NSZ= 15				The results showed that only one NSZ has fractured at the 12-month follow-up.
	1= <50% surface chipped			Score 0	Score 1	Score 2 at 12 m	
	2= >50% surface chipped		n (%)	14 (93)	0 (0)	1 (7)	
Kist et al ., 2019 ^[42]	Universal testing machine	NA	Total number of crowns= 85				The results showed that among the prefabricated ZCs before aging, NZS had the highest fracture loads, followed by KKZ and SEC. After aging, results showed that KKZ scored the highest fracture loads among all prefabricated ZCs. However, the CAD/CAM crowns showed Significantly higher fracture loads than prefabricated ZCs. The PVSSC showed the highest fracture loads when compared with all types of ZCs, both with and without aging.
			SEC: Mean (SD)		893 (223)		
			KKZ: Mean (SD)		1570 (368)		
			NSZ: Mean (SD)		1582 (638)		
			CAD/CAM ZC: Mean (SD)		2444 (360)		
			PVSSC: Mean (SD)		6251 (1170)		

Al shobber et al., 2017 ^[50]	Universal testing machine	NA	Total number of teeth in each group (N)=16					The results showed that NZS scored the highest fracture loads.
			CCP: Mean (SD)		415.58 (12.28)			Whereas CCP, showed the lowest forces required for fracture of
			CCZ: Mean (SD)		751.43 (102.1)			the crown. Both NSZ and CCZ showed statistically significant dif-
			NSZ: Mean (SD)		646.68 (229.62)			ference in forces required to fracture the crowns when compared
			PVSSC: Mean (SD)		482.37 (76.94)			to PVSSC (p<0.05).
El Makawi et al., 2019 ^[43]	Universal testing machine	NA	Total number of teeth in each group (N)=10					The results showed that NSZ scored high mean and SD values.
			NSZ: Mean (SD)		1420.893 (308.39)			While LDE scored lower mean and SD with values with a statisti-
			LDE: Mean (SD)		854.427 (130.52)			cally significant difference between them (p=0.0001).
Townsend et al., 2014 ^[53]	Universal testing machine	NA	Total number of teeth in each group (N)=20					The results showed that the forces required to fracture EZP was
			EZP: Mean (SD)		1091(146.5)			significantly higher than NSZ and KKZ (P<0.001). In addition,
			KKZ: Mean (SD)		576 (132.3)			NSW required significantly higher forces to be fractured more
			NSZ: Mean (SD)		691 (113.3)			than all three ZCs (P<0.001).
			PVSSC: Mean (SD)		1937(545.5)			
Azab et al., ^[54]	Visual inspection to detect incom- plete fracture lines or complete frac- tures with loss of crown material	At 1 week, 1, 3, 6, 9, 12, 18, 24, and 36 m	Zero fractured crowns at all follow-up time-points.					The results showed that there were no fractured crowns noted for both types of cements.
Padmanabh et al., 2021 ^[57]	0= No fracture 1= Cracks detected visually and manually less than 1/3 of surface 2= Cracks detected visually and manually from 1/3 to 1/2 of surface 3= Cracks detected visually and manually more than 1/2 of surface	NA	Total number of teeth in each group (N)=20					The results showed that there were no fractures noted after sterili- zation between different types of crowns in all control and experi- mental groups.
			Score	0	1	2	3	
			PVSSC n (%)	20 (100%)	0	0	0	
			SSC n (%)	20 (100%)	0	0	0	
			ZC n (%)	20 (100%)	0	0	0	
Talekar et al. 2021	0= intact occlusal surface			At 12 m		At 18 m		

Mohn et al., 2021 ^[69]	Thermomechanical loading	NA	-	<p>The results showed that (CAD/CAM) ZC reported the lowest wear resistance among other groups. Whereas RCSC showed significantly lower wear depth compared to gold standard. However, there was no sign of wear on the surface of NSZ. On other hand, KKZ showed 119-micrometervertical wear along with microcrack signs.</p> <p>Furthermore, (CAD/CAM) ZC exhibit significantly lower antagonist wear than SSC ($p < .05$).</p>
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Abbreviation: EYP, EZ Pedo crown; KKZ, Kinder Krown Zirconia crown; NSZ, NuSmile Zirconia crown; NSW, Nusmile Signature crown; ZC, Zirconia crown; NA, Not applicable; SEC, Spring EZ crown; CAD/CAM, Computer-aided manufacturing/Computer-aided modeling; CCZC, CAD/CAM zirconia crown; PVSSC, Preveenerd stainless steel crown; SD, Standard deviation; CCZ, Cheng crown zirconia; CCP, Cheng crown preveenerd; LDE, Lithium disilicate endocrown; SSC, Stainless steel crown; GFRC, Glass fiber-reinforced composite crown - Figaro Crowns; NCCE, Nano-Ceramic Compo-site Endo-crowns.

Supplemental Table S6. Summary of the included studies' findings about the marginal integrity of zirconia crowns for primary teeth.

Study	Assessment Method	Time of Evaluation	Results			Summary of Results
Holsinger et al., 2016 [44]	Visible inspection and tactile examination with an explorer 0= Closed margin 1= Open margin	(Retrospective study) 2010 – 2014	Total number of EZP (N) =44			The results showed that majority of EZP (86%) had closed margins, and few (14%) had open margins.
			Score	0	1	
			EZP n(%)	38 (86)	6 (14)	
AlHaj et al., 2019 [52]	Thirteen measurements were made at 13 different sites on the digital photographs of the sectioned surfaces of the specimens using	NA	Total number of teeth in each group (N) = 15			The results showed that NSZ cemented with resin cement had significantly lower internal gap width mean than PVSSCs and SSCs cemented with resin cement (P<0.001). In addition, the difference between NSZ, PVSSC and SSC and luting
			Mean (SD)			
			Gap	Crown type	Luting cement	
				SSC	GIC	
			Marginal	0.35 (0.17)	0.38 (0.16)	
Internal	0.34 (0.12)	0.37 (0.09)				

a modified method to that adopted by Korkut et al.						PVSSCs			RMGIC			cement used, was not significant regarding the width of the marginal gap (P>0.05).	
			Marginal			0.34 (0.22)			0.26 (0.18)				
			Internal			0.38 (0.12)			0.26 (0.11)				
						NSZ			Resin Cement				
			Marginal			0.17 (0.09)			0.24 (0.20)				
			Internal			0.19 (0.12)			0.29 (0.20)				
Donly et al., 2018 ^[55]	A= Clinically ideal, with no ditching or gap B= Clinically acceptable, with evidence of ditching or gap C= Clinically unacceptable, with mobility, making crown replacement necessary.	At 6, 12, and 24 m	Total number of teeth in each group (N)	6m N=44			12m N=43			24m N=39			The results showed that the majority NSZ scored A except 13 crowns scored B, 4 of them at 6 months follow-up, 6 of them at 12 month and only 3 at 24 months. Whereas in SCC, almost all crowns scored A and only 1 scored B, at 6, 12- and 24-months follow-up.
Alaki et al., 2020 ^[58]	0= Close marginal adaptation 1= No detectable margin 2= Detectable margin	At 3, 6 and 12 m	-										The results showed that 11.7% of the RCSC group had small but noticeable area of material marginal loss.
Gill et al., 2020 ^[38]	0= No discrepancies detected with explorer 1= Detectable discrepancies but clinically acceptable 2= Detectable discrepancies, replacement required	At 12 m	Total number of teeth (N) = 135										The results showed that NSZ had the second highest rate (93%) when measuring the marginal adaptation.
			Score		0		1		2		Missing n (%)		
			RCSC n (%)		33 (69)		11 (23)		3 (6)		1 (2)		
			PVSSC n (%)		46 (98)		1 (2)		0 (0)		0 (0)		
			NSZ n (%)		37 (93)		2 (5)		0 (0)		1 (3)		
			Total n (%)		116 (86)		14 (10)		3 (2)		2 (2)		
Nischal et al., 2020 ^[60]	Alpha criteria rating system.	At 3, 6 and 9 m	Total number of teeth in each group (N) = 15										
				3m		6m		9m					

			Score	A	B	C	D	A	B	C	D	A	B	C	D	The results showed that ZCs had no change in the marginal integrity after 9 months of recall.
			RCSC n (%)	15 (100)	0	0	0	12 (80)	3 (20)	0	0	9 (60)	3 (20)	1 (7)	2 (13)	
			ZC n (%)	15 (100)	0	0	0	15 (100)	0	0	0	15 (100)	0	0	0	
			Luxa Crown n (%)	15 (100)	0	0	0	15 (100)	0	0	0	11 (87)	1 (7)	1 (7)	2 (13)	
Yanover et al., 2020 ^[63]	0= Continuous with the contour of the crown 1= Slight overhang or under-contour present 2= Large defects noted	At 6-10.4m, 12.5-17.9m, 18.4-33.8m	Total Number of ZC (N) =1 31													The results showed that the majority of the ZCs were nicely adapted 82.4% with only 13.7% of the crowns were slight over-hanged or under-contoured and 3.9% were found with large defects.
			Score		0			1			2					
			n (%)		107 (82.4)			18 (13.7)			6 (3.9)					
Möhn et al., 2021 ^[69]	Thermomechanical loading	N/A	-													The results showed that (CAD/CAM) ZC reported a significantly higher marginal adaptation compared to other crowns. Whereas ZC cemented with GI cement revealed lowest continuity in the margins.

Abbreviation: EZP, EZ Pedo crown; NA, Not applicable; SD, Standard deviation; SSC, Stainless steel crown; PVSSC, Preveenerd stainless steel crown; GIC, Glass ionomer cement; RMGIC, Resin modified glass ionomer cement; NSZ, NuSmile Zirconia crown; RCSC, Resin composite strip crown; ZC, Zirconia crown.

Supplemental Table S7. Summary of the included studies' findings about the surface roughness of zirconia crowns for primary teeth.

Study	Assessment Method	Results					Summary of Results
Walia et al., 2019 ^[41]	Using a mechanical surface roughness tester/ profilometer	Total number of teeth in each group (N) = 10					The results showed that there were significantly different surface roughness and roughness depth scores for KKZ first and second molar when compared to CCZ, SEC and NSZ for occlusal surfaces (p=0.013). A similar result was observed for occlusal edges for first and second primary molars (p = 0.013).
		Surface roughness Mean (SD)					
		Crown type	Occlusal surface First molar	Occlusal surface Second molar	Occlusal edge (buccal cusps) First molar	Occlusal edge (buccal cusps) Second molar	
		CCZ	0.34 (0.07)	0.36 (0.04)	0.30 (0.04)	0.28 (0.02)	
		SEC	0.39 (0.09)	0.45 (0.07)	0.41 (0.08)	0.36 (0.03)	
		NSZ	0.37 (0.06)	0.40 (0.06)	0.40 (0.06)	0.35 (0.05)	
		KKZ	0.70 (0.03)	0.91 (0.09)	1.04 (0.26)	0.60 (0.12)	
		Roughness depth Mean (SD)					
			Occlusal surface First molar	Occlusal surface Second molar	Occlusal edge (buccal cusps) First molar	Occlusal edge (buccal cusps) Second molar	
		CCZ	1.10 (0.08)	0.86 (0.12)	1.03 (0.09)	1.03 (0.09)	
		SEC	1.20 (0.28)	1.30 (0.63)	1.30 (0.16)	1.56 (0.44)	
		NSZ	1.53 (0.16)	0.90 (0.08)	1.10 (0.01)	1.16 (0.12)	
		KKZ	2.23 (0.28)	2.23 (0.28)	3.5 (0.99)	2.66 (0.36)	
Theriot et al., 2017 ^[51]	Using a mechanical surface roughness tester/ profilometer	Total number of teeth in each group (N) = 20					The results showed that the lingual surfaces of NSZ had a statistically significant lower mean of surface roughness than the lingual surfaces of SEC and KKZ (P<0.001).
		Surface roughness Mean (SD)					
			Labial crown surface		Lingual crown surface		
		NSZ	2.8 (0.3)		1.9 (0.5)		

		SEC			2.5 (0.51)			3.7 (0.8)			Whereas in the labial surfaces of KKZ, results showed a statistically significant higher mean of surface roughness than the labial surfaces of NSZ and SEC (P<0.001).				
		KKZ			4.3 (0.61)			3.2 (0.6)							
Donly et al., 2018 ^[55]	A= Ideal, with a smooth crown surface B= Clinically acceptable, with a slightly rough C= Clinically unacceptable, with a crown fracture	Total number of teeth in each group (N)	6m N=43			12m N=43			24m N=39			The results showed that NSZ has scored A (clinically ideal) in all time points 6, 12 and 24 months except two crowns scored B, one crown after 6 months and the other after 24 months with no crown scored C. Whereas in SSC, all crowns scored A at all evaluation time-points. There were no statistically significant differences between both crowns (P<0.05).			
			Score	A	B	C	A	B	C	A	B		C		
			NSZ (n)	42	1	0	43	0	0	35	1		0		
			SSC (n)	43	0	0	42	0	0	34	0		0		
Nischal et al., 2020 ^[60]	The Modified United States Public Health Service (USPHS) criteria	Total number of teeth in each group (N) = 15											The results showed that at 9-month follow up, the surface texture of ZCs did not change.		
			3m				6m				9m				
		Score	A	B	C	D	A	B	C	D	A	B		C	D
		RCSC n (%)	15 (100)	0	0	0	15 (100)	0	0	0	12 (80)	3 (20)		0	0
		ZC n (%)	15 (100)	0	0	0	15 (100)	0	0	0	15 (100)	0		0	0
		Luxa Crown n (%)	15 (100)	0	0	0	15 (100)	0	0	0	13 (87)	2 (13)		0	0

Abbreviation: SD, Standard deviation; CCZ, Cheng crown zirconia; SEC, Spring EZ crown; SSC, Stainless steel crown; NSZ, NuSmile Zirconia crown; KKZ, Kinder Krown Zirconia crown; RCSC, Resin composite strip crown; ZC, Zirconia crown.

Supplemental Table S8. Summary of the included studies' findings about recurrent caries with zirconia crowns for primary teeth.

Study	Assessment Score	Time of Evaluation	Results							Summary of Results	
Holsinger et al., 2016 ^[44]	0= No caries 1=Recurrent caries	(Retrospective study) 2010 – 2014	Total number of EZP (N) = 44							The results showed that EZP did not report recurrent caries.	
					Score 0		Score 1				
			n (%)		44 (100)		0 (0)				
Donly et al., 2018 ^[55]	0= No caries 1=Recurrent caries	At 6,12 and 24 m	Total number of teeth in each group (N)	6 m N=43		12 m N=43		24 m N=39		The results indicated that both NSZ and SSC showed no recurrent caries.	
			Score	0	1	0	1	0	1		
			NSZ: n	43	0	43	0	36	0		
			SSC: n	43	0	42	0	34	0		
Alaki et al., 2020 ^[58]	0= No caries 1= Caries	At 3, 6 and 12 m	Total number of teeth in each group (N) = 60							The results showed that none of the teeth covered with ZC had developed recurrent caries. While for RCSC group, at 12 months follow up, 6.7% had presented with recurrent caries, but this finding was not significant (p < 0.135).	
				3m		6m		12m			
			Score	0	1	0	1	0	1		
			ZC n (%)	60 (100)	0	59 (100)	0	58 (100)	0		
			RCSC n (%)	60 (100)	0	60 (100)	0	56 (93.3)	4 (6.7)		
Nischal et al., 2020 ^[60]	0= No caries 1=Recurrent caries	At 3, 6 and 9 m	Total number of teeth in each group (N) = 15							The results showed that ZCs did not develop secondary caries. When all groups were compared, there was a statistically significant difference (p value = 0.012).	
				3m		6m		9m			
			Score	0	1	0	1	0	1		
			RCSC n (%)	15 (100)	0	15 (100)	0	11 (73.4)	4 (26.6)		
			ZC n (%)	15 (100)	0	15 (100)	0	15 (100)	0		

	Luxa Crown n (%)	15 (100)	0	15 (100)	0	15 (100)	0	
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Abbreviation: EZP, EZ Pedo crown; NSZ, NuSmile Zirconia crown; SSC, Stainless steel crown; ZC, Zirconia crown; RCSC, Resin composite strip crown; DCR, Direct resin composite restoration.

Supplemental Table S9. Summary of the included studies' findings about the crown contour of zirconia crowns for primary teeth.

Study	Assessment Method	Time of Evaluation	Results				Summary of Results
Holsinger et al., 2016 ^[44]	0= Crown is cosmetic, natural looking.	(Retrospective study)	Total number of EZP (N) = 44				The results showed that the majority of the EZP (89%) were cosmetic and natural-looking whereas fewer were acceptable (9%) and not esthetic (2%).
	1= Size/shape is acceptable, not ideal	2010–2014		0	1	2	
	2= Crown not esthetic, detracts from appearance of the mouth		n (%)	39 (89%)	4 (9%)	1 (2%)	
Yanover et al., 2020 ^[63]	0= Cosmetic	At 6-10.4m	Total number of ZC (N) = 131				According to the crown contour, the teeth rated as cosmetic were 55% (72 teeth), while 35% (47 teeth) appeared acceptable, and 9% (12 teeth) considered as not aesthetic crowns.
	1= Acceptable	12.5-17.9m		0	1	2	
	2= No aesthetic	18.4-33.8m	n (%)	72 (55)	47 (35)	12 (9)	

Abbreviation: EZP, EZ Pedo crown.