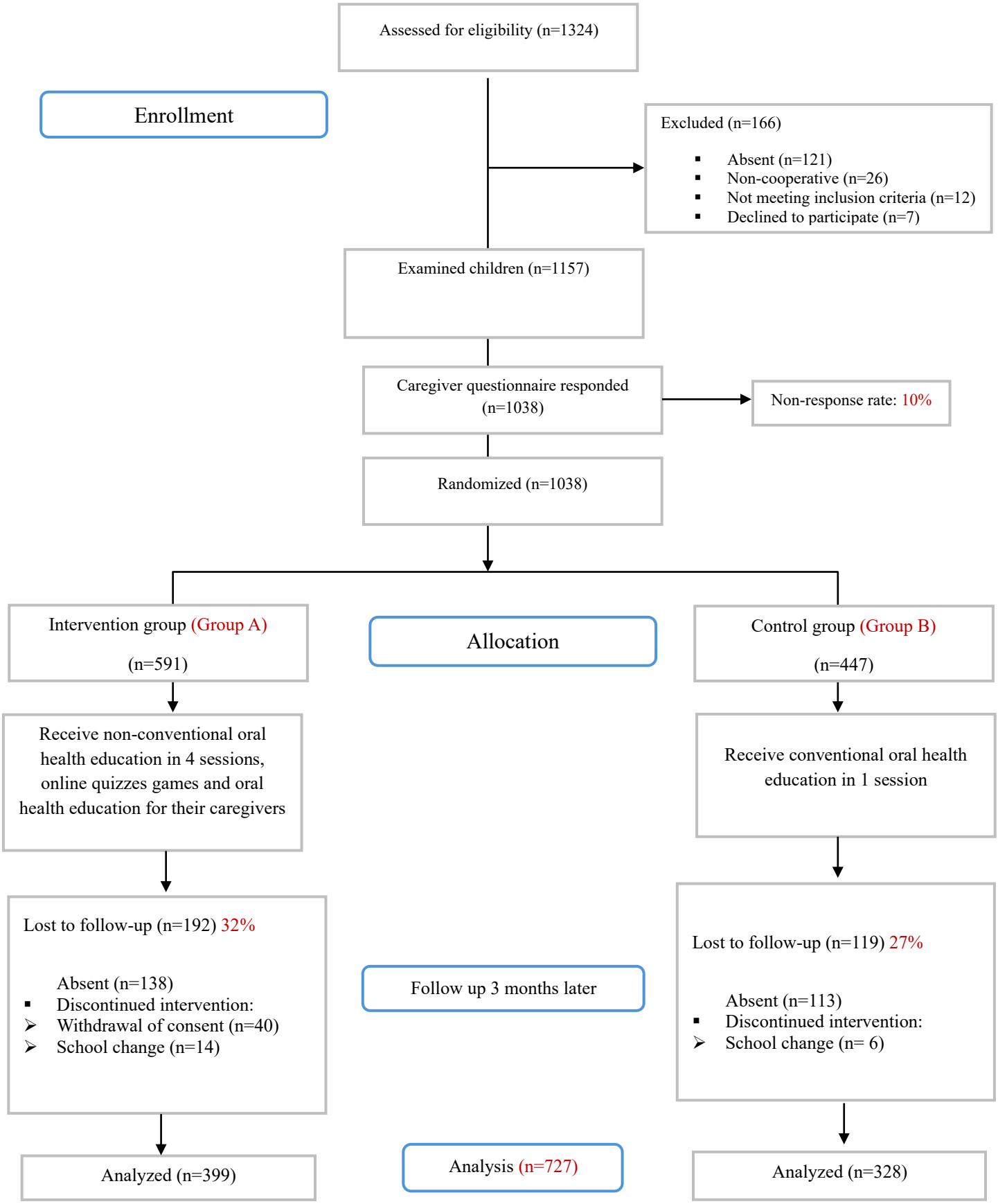
Participant Flow



Baseline Characteristics

1- Demographic

Table 1. Frequency and percentage distribution of demographic characteristics for the intervention group (Group A) and control group (Group B)

Variable	Total (n= 727)	Frequency (%) Group (A) (n= 399)	Group (B) (n= 328)
Child's Order among siblings			
3rd or below	527 (72.5)	292 (73.2)	235 (71.6)
More than 3rd	200 (27.5)	107 (26.8)	93 (28.4)
Child Gender			
Male	349 (48)	187 (46.9)	162 (46.4)
Female	378 (52)	212 (53.1)	166 (50.6)
Caregiver Gender			
Male	65 (8.9)	35 (8.8)	30 (9.1)
Female	662 (91.1)	364 (91.2)	298 (90.9)
Place of residency			
Al-Hofuf	298 (41)	181 (45.4)	117 (35.7)
Al-Mubarraz	357 (49.1)	186 (46.6)	171 (52.1)
Village	72 (9.9)	32 (8)	40 (12.2)
Caregiver Nationality			
Saudi	717 (98.6)	392 (98.2)	325 (99.1)
Non-Saudi	10 (1.4)	7 (1.8)	3 (0.9)
Child Nationality			
Saudi	722 (99.3)	395 (99)	326 (99.4)
Non-Saudi	5 (0.7)	4 (1)	2 (0.6)
Caregiver-child Relationship			
Parent	722 (99.3)	395 (99)	327 (99.7)
Other	5 (0.7)	4 (1)	1 (0.3)
Caregiver-Marital status			
Married	696 (95.7)	380 (95.2)	316 (96.3)
Other	31 (4.3)	19 (4.8)	12 (3.7)
Male caregiver education level			
School	356 (49)	188 (47.1)	168 (51.2)
University	371 (51)	211 (52.9)	160 (48.8)
Female caregiver education level			
School	331 (45.5)	173 (43.4)	158 (48.2)
University	396 (54.5)	226 (56.6)	170 (51.8)
Male caregiver employment status			
Unemployed	98 (13.5)	48 (12)	50 (15.2)
Employed	629 (86.5)	351 (88)	278 (84.8)

Female caregiver employment status			
Unemployed	571 (78.5)	303 (75.9)	268 (81.7)
Employed	156 (21.5)	96 (24.1)	60 (18.3)
Monthly household income			
Low income	196 (27)	99 (24.8)	97 (29.6)
Middle income	421 (57.9)	234 (58.6)	187 (57)
High income	110 (15.1)	66 (16.5)	44 (13.4)

2- Oral Hygiene Status

Table 2. Frequency and percentage distribution of baseline oral hygiene status among preschool children using simplifies debris index (n= 727)

Baseline Oral Hygiene Score	Frequency (%)	Oral Hygiene Status	Frequency (%)
0.1	4 (0.6)	Good	98 (13.6)
0.3	18 (2.5)		
0.5	34 (4.7)		
0.6	42 (5.8)		
0.8	58 (8)	Fair	491 (67.4)
1	73 (10)		
1.1	73 (10)		
1.3	72 (9.9)		
1.5	81 (11.1)		
1.6	77 (10.6)		
1.8	57 (7.8)		
2	48 (6.6)	Poor	138 (18.9)
2.1	36 (5)		
2.3	21 (2.9)		
2.	17 (2.3)		
2.6	14 (1.9)		
2.8	1 (0.1)		
3	1 (0.1)		

Table 3. Frequency and percentage distribution of baseline oral hygiene status for the intervention group (Group A) and control group (Group B)

Group (A) (n = 399)			Group (B) (n = 328)		
Baseline Oral Hygiene Score	Frequency (%)	Oral Hygiene Status n (%)	**Baseline Oral Hygiene Score**	Frequency (%)	Oral Hygiene Status n (%)
0.1	2 (0.5)	Good	**0.1**	2 (0.6)	Good
0.3	10 (2.5)	58 (15)	**0.3**	8 (2.4)	40 (12)
0.5	21 (5.3)		**0.5**	13 (4)	
0.6	25 (6.3)		**0.6**	17 (5.2)	
0.8	25 (6.3)	Fair	**0.8**	33 (10.1)	Fair
1	34 (8.5)	252 (63)	**1**	39 (11.9)	239 (73)
1.1	42 (10.5)		**1.1**	31 (9.5)	
1.3	32 (8)		**1.3**	40 (12.2)	
1.5	38 (9.5)		**1.5**	43 (13.1)	
1.6	46 (11.5)		**1.6**	31 (9.5)	
1.8	35 (8.8)		**1.8**	22 (6.7	
2	28 (7)	Poor	**2**	20 (6.1)	Poor
2.1	18 (4.5)	89 (22)	**2.1**	18 (5.5)	49 (15)
2.3	16 (4)		**2.3**	5 (1.5)	
2.5	14 (3.5)		**2.5**	3 (0.9)	
2.6	11 (2.8)		**2.6**	3 (0.9)	
2.8	1 (0.3)				
3	1 (0.3)				

3- Mothers' Oral Health Knowledge, Attitude, and Practice

Table 4. Frequency and percentage distribution of the mothers" knowledge toward their children's oral health (n= 727)

Variable	Frequency (%)
Child's mouth consists of:	
Teeth, tongue, and gums*	715 (98.3)
Other	12 (1.7)
The total number of primary teeth is:	
20 teeth*	483 (66.4)
Other	244 (33.6)
The tooth consists of:	
Two parts crown and root*	376 (51.7)
Other	351 (48.3)
The tooth consists of several layers, which are:	
Enamel, dentin, and pulp*	511 (70.3)
Other	216 (29.7)
Dental plaque is:	
A soft, sticky film of bacteria, food particles, and saliva that adhere to the teeth*	122 (16.8)
Other	605 (83.2)
When Plaque accumulates on teeth:	
It may lead to tooth decay*	182 (25)
Other	545 (75)
Dental caries is:	
Tooth decay due to the interaction of bacteria with some foods such as sugars and carbohydrates to form an acid that can lead to cavities*	532 (73.2)
Other	195 (26.8)
The initial stages of dental caries are often:	
Hard to feel*	476 (65.5)
Other	251 (34.5)
Late stages of dental caries may lead to:	
(A, B) Tooth pain, inflammation and tooth loss*	513 (70.6)
Other	214 (29.4)
Dental caries in its late stages can cause:	
(A, B) Problems with eating, speaking, playing, learning and Absence from school*	463 (63.7)
Other	264 (36.3)
How often should a child brush their teeth?	
At least twice a day*	646 (88.9)
Other	81 (11.1)
The most crucial time to brush the teeth is:	
In the evening before going to sleep*	515 (70.8)
Other	212 (29.2)
Who is responsible for brushing the teeth of children up to the age of 7?	
Parents or guardians*	621 (85.4)
Other	106 (14.6)
When should you start brushing your child's teeth?	

When the first baby tooth appears*	416 (57.2)
Other	311 (42.8)
When the first baby tooth appears how should a child's teeth be clean?	
Use a special toothbrush designed for children of this age*	584 (80.3)
Other	143 (19.7)
Not cleaning the tongue can result in:	
The buildup of bacteria and debris, causing bad breath*	682 (93.8)
Other	45 (6.2)
When a child reaches their first year:	
Start using a very small amount of toothpaste on the brush (about the size of a grain of rice)*	404 (55.6)
Other	323 (44.4)
When a child reaches their third year:	
Start using a pea-sized amount of toothpaste on the brush*	499 (68.6)
Other	228 (31.4)
When should a child have their first visit to the dentist?	
After the first baby tooth appears*	135 (18.6)
Other	592 (81.4)
How frequently should a child have a dental check-up?	
Every 6 months	608 (83.6)
Other	119 (16.4)
What is a fissure sealant, also known as a "preventive filling"?	
A protective material applied to the surfaces of the posterior teeth*	153 (21)
Other	574 (79)
Fluoride is a mineral that:	
Helps to strengthening the outer layer of teeth and making them more resistant to decay*	553 (76.1)
Other	174 (23.9)
Fluoride can be used through:	
All answers correct*	336 (46.2)
Other	391 (53.8)
Knowledge level:	**Frequency (%)**
Low Knowledge	40 (5.5)
Medium Knowledge	375 (51.6)
High Knowledge	312 (42.9)

* = *Correct answer, other = Wrong/Don't know*

Table 5. Frequency and percentage distribution of mothers' attitude toward their children oral health (n= 727)

Variable	Frequency (%)
I believe that teeth are an important part of my child's body	
Disagree	3 (0.4)
Neutral	2 (0.3)
Agree	722 (99.3)
I believe that dental health has an impact on the child's overall health.	
Disagree	1 (0.1)
Neutral	7 (1)
Agree	719 (98.9)
I believe that oral and dental problems may cause a child to miss school.	
Disagree	9 (1.3)
Neutral	31 (4.3)
Agree	687 (94.5)
I believe that dental caries is preventable.	
Disagree	9 (1.2)
Neutral	37 (5.1)
Agree	681 (93.7)
I believe that brushing a child's teeth regularly twice a day (morning and evening) can prevent tooth decay.	
Disagree	10 (1.4)
Neutral	43 (5.9)
Agree	674 (92.7)
I believe that regular dental visits (every 6 months) for children are essential for early detection of tooth decay.	
Disagree	8 (1.1)
Neutral	34 (4.7)
Agree	685 (94.2)
Attitude level	**Frequency (%)**
Negative Attitude	4 (0.6)
Neutral Attitude	32 (4.4)
Positive Attitude	691 (95)
Total	727 (100)

Disagree = strongly disagree/ Disagree, Agree = strongly agree/ Agree

Table 6. Frequency and percentage distribution of caregivers' practice toward their children oral health (n= 727)

Variable	Frequency (%)
How often does your child brush their teeth?	
Regularly twice a day (morning and evening) *	250 (34.4)
Other	477 (65.6)
Who brushes your child's teeth?	
I brush my child's teeth*	154 (21.2)
Other	573 (78.8)
How often do you change your child's toothbrush?	
When the shape of the brush changes*	272 (37.4)
Other	455 (62.6)
How often do you clean your child's tongue with a brush or tongue scraper?	
Always*	131 (18)
Other	596 (82)
Have you used preventive measures, such as fissure sealants, for your child's teeth?	
Yes, I have*	13 (1.8)
Other	714 (98.2)
Have you used preventive measures, such as applying fluoride at the dental clinic, for your child's teeth?	
Yes, I have*	97 (13.3)
Other	630 (86.7)
How frequently do you take your child to the dental clinic for check-ups?	
Every 6 months*	152 (20.9)
Other	575 (79.1)

*** = *Adequate practice, other = Inadequate practice*

Outcome Measures

Table 1. Pre and post oral hygiene scores of non-conventional and conventional oral health educations

Paired t-test	**Non-conventional (A)** Mean (± S.D.)	**Conventional (B)** Mean (± S.D.)
Pre-Score	1.45 (± 0.6)	1.33 (± 0.51)
Post-Score	0.64 (± 0.45)	0.77 (± 0.46)
***p*-value**	< 0.001	< 0.001

Table 2. Comparison of oral hygiene scores difference between non-conventional and conventional oral health education

Independent t-test	
Group (A) Mean Score-difference (± S.D.)	0.81 (± 0.60)
Group (B) Mean Score-difference (± S.D.)	0.56 (± 0.55)
Mean Difference (± S.E.)	0.25 (± 0.04)
p-value (two-sided)	< 0.001
95% C.I. for Mean Difference	(0.16 to -0.33)

Table 3. Tests of Time (Pre vs. Post) and Group Effects on Oral Hygiene Scores Using Repeated Measures General Linear Model (GLM)

Effect	**Test Statistic**	**F**	**df (Hypothesis)**	**p-value**	**Partial Eta Squared**
Time (factor1)	Wilks' Lambda	1010.72	1	<0.001	0.58
Group × Time	Wilks' Lambda	33.08	1	<0.001	0.04

Table 4. Comparison of children's improvement levels about mothers' perceptions of non-conventional (A) (n =399) and conventional (B) (n= 328) oral health education. Chi Square Test

Mothers' perceptions of their children's oral health knowledge and behavior regarding oral health education		**Oral health education**		**OR (95% C.I.)**	***p*-value**
Item		**A**	**B**		
The program positively affected my child's knowledge of oral and dental hygiene.	No/ To some extent	44 (23.5)	143 (76.5)	6.25 (4.35–9.09)	$p < 0.00$
	Yes	355 (65.7)	185 (34.3)		
My child gained more knowledge about the importance of brushing their teeth.	No/ To some extent	40 (23.4)	131 (76.6)	6.09 (4.17–8.89)	$p < 0.00$
	Yes	359 (64.6)	197 (35.4)		
I noticed an improvement in my child's oral hygiene habits (e.g., regular brushing) after participating in the program.	No/ To some extent	93 (31.8)	199 (68.2)	5.26 (3.68–7.52)	$p < 0.00$
	Yes	306 (70.3)	129 (29.7)		
My child became more interested in brushing his/her teeth after participating in the program.	No/ To some extent	85 (29.2)	206 (70.8)	6.25 (4.52–8.65)	$p < 0.00$
	Yes	314 (72)	122 (28)		

Chi-Square test significant level $p < 0.05$

Table 5. Frequency and percentage distribution of the impact of oral health education lecture on mothers' knowledge and behavioral improvement regarding their children's oral health in group (A) (n = 399)

Variable	Frequency (%)
The lecture improved my knowledge about my child's oral and dental health.	
a) Yes	345 (86.5)
b) No	54 (13.5)
I have become more diligent in brushing my child's teeth every day.	
a) Yes	348 (87.2)
b) No	51 (12.8)
I have become more diligent in brushing my child's teeth before bedtime.	
a) Yes	342 (85.7)
b) No	57 (14.3)
I have become more diligent in brushing my child's tongue daily.	
a) Yes	322 (80.7)
b) No	77 (19.3)
I have become more diligent in visiting the dentist every six months for my child's routine check-up.	
a) Yes	242 (60.7)
b) No	157 (39.3)
The program positively affected my knowledge of preventive measures, such as applying fluoride to teeth.	
a) Yes	312 (78.2)
b) No	87 (21.8)
The program positively affected my knowledge of preventive measures, such as sealant application (fissure sealants) to protect teeth.	
a) Yes	329 (82.5)
b) No	70 (17.5)
I took my child to the dentist to apply fluoride to their teeth.	
a) Yes	100 (25.1)
b) No	299 (74.9)
I took my child to the dentist to apply fissure sealants to their teeth.	
a) Yes	6 (1.5)
b) No	393 (98.5)
Improvement level	**Frequency (%)**
No/ Limited improvement	125 (31.3)
Good improvement	274 (68.7)

Yes = Yes, No = (To some extent/No)

Adverse Events

There were no adverse events associated with this study.