Research Article

Consequence Of Motivational Interviewing on Oral Health Status of Children After Receiving Full Mouth Dental Rehabilitation Under General Anesthesia - Randomized Controlled Interventional Trial.

Sherin Arulraj[*1], P. Mahesh Kumar[2], Sunil Kumar Mahadev[3], Vignesh Guptha Raju[4], Sudhakar S[5], Dhivyashanthi Sankar[6]

[1*]MDS, Post Graduate Student, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Orchid ID: 0009-0000-4095-9302 Mail: sherinpedo0104@gmail.com
[2]MDS, Professor, Head of The Department, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Mail: drmahesh1972@gmail.com
[3]MDS, Professor, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Mail: drmsk89@gmail.com
[4]MDS, PHD, Professor, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Mail: vigneshguptha88@gmail.com
[5]MDS, Senior Lecturer, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Mail: dr.sudhakar.0011@gmail.com
[6]MDS, Senior Lecturer, Department of Pediatric and Preventive Dentistry, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakkam, Tamil Nadu, India, Orchid ID: 0009-0000-1730-8026, Mail: dhivyadhivya484@gmail.com

Abstract

Background: Early childhood caries (ECC) is one of the most common in children and often requires full mouth dental rehabilitation (FMDR) under general anesthesia in severe cases. Although FMDR effectively restores oral health, recurrence of caries is common due to persistent unfavorable oral hygiene and dietary practices. Motivational interviewing (MI), a patient-centered behavioral counseling approach, may improve parental motivation and promote sustained oral health practices in children.

Subjects and Methods: This randomized controlled interventional trial was conducted among 20 children aged 3–6 years diagnosed with ECC and requiring FMDR under general anesthesia. Participants were randomly allocated into two groups: control group and intervention group. Oral hygiene status, parental knowledge, and oral health-related quality of life (OHRQoL) were assessed at baseline, 3,6 months.

Results: Both groups showed significant improvement in oral hygiene status, parental knowledge, and quality of life over the follow-up period ($p < 0.05$). The intervention group demonstrated slightly better improvement in oral hygiene and more consistent enhancement in parental knowledge and OHRQoL compared to the control group.

Conclusion: Motivational interviewing appears to be an effective adjunct to conventional oral health education in children undergoing FMDR under general anesthesia. It promotes improved parental knowledge, supports positive behavioral changes, and may enhance long-term oral health outcomes and quality of life.

Keywords: Motivational interviewing, Oral health, Parental knowledge, Quality of life, Audiovisual aids.

INTRODUCTION

Early childhood caries (ECC) remains one of the most prevalent chronic diseases affecting children worldwide, often progressing rapidly and leading to pain, infection, and compromised quality of life. In severe cases, comprehensive dental treatment under general anesthesia (GA) becomes necessary to manage extensive disease, restore function, and alleviate discomfort. While full mouth dental rehabilitation under GA offers immediate clinical resolution, it does not address the underlying behavioural, dietary, and oral hygiene practices that contribute to disease initiation and recurrence. Consequently, recurrence of caries following GA treatment has been widely reported, highlighting the need for effective preventive strategies that extend beyond operative care [1].

Parental influence plays a pivotal role in shaping a child's oral health behavior, particularly in the early years when children are entirely dependent on caregivers [2,3,4]. Traditional oral health education methods, which are often directive and information-based, have shown limited success in achieving sustained behaviour change [5,6,7]. In contrast, motivational interviewing (MI), a patient-centered counselling approach, focuses on enhancing intrinsic motivation and resolving hesitation toward behavioral change [8]. By fostering collaboration, empathy, and autonomy, MI has emerged as a promising tool in promoting positive oral health practices such as improved brushing habits, reduced sugar intake, and adherence to follow up care [9,10].

To address these challenges, this study aims to evaluate the clinical impact of motivational interviewing on the oral health status of children following comprehensive dental rehabilitation under GA. Specially, we evaluate its effectiveness in driving sustained behavioral modification and minimizing post operative disease relapse, testing the

null hypothesis that MI yields no significant difference in long term oral health outcomes.

MATERIALS AND METHODOLOGY

Study Design and Setting

This study was designed as a Randomized Controlled Interventional Trial conducted among pediatric patients between age group of 3-6years requiring full mouth dental rehabilitation under general anesthesia. The study was carried out in the Department of Pediatric and Preventive Dentistry at Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu. The total study period spanned from December 2025 to June 2026.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee. The clinical trial was formally registered with the clinical trial registration of India (CTRI/2025/11/096750). Consent was obtained from the parents or legal guardians of all participating children prior to their inclusion in the study.

Sample Size

The sample size was calculated using the following formula:

$$n = \frac{2\sigma^2 (Z_{1-\alpha/2} + Z_{1-\beta})^2}{d^2}$$

Where:

n= required sample size in each group

σ= pooled standard deviation obtained from previous similar studies

d= expected mean difference between intervention and control groups

$Z_{1-\alpha/2}$= standard normal deviate at 95% confidence interval (1.96)

$Z_{1-\beta}$= standard normal deviate corresponding to 80% power (0.84)

Based on the estimated mean difference and pooled standard deviation derived from previous literature, the minimum required sample size was calculated as 10 participants per group. Therefore, a total sample size of 20 children was included in the present study.

Study Procedure

A total of 20 children aged between 3 to 6 years diagnosed with early childhood caries (ECC) were included in the study. The participants were assigned equally into two groups, with 10 subjects in each group, using simple randomization.

Inclusion Criteria:

- Children aged between 3–6 years.
- Diagnosed with severe early childhood caries requiring FMR under GA.
- ASA I and ASA II physical status classification
- Parents/ legal guardians with a minimum educational qualification of Secondary School Leaving Certificate or above.
- dmft score of ≥ 4 (age 3) or ≥5 (age 4 - 5).
- Parents or guardians who commit to attend all scheduled post operative follow up recalls (3,6 months).

Exclusion Criteria:

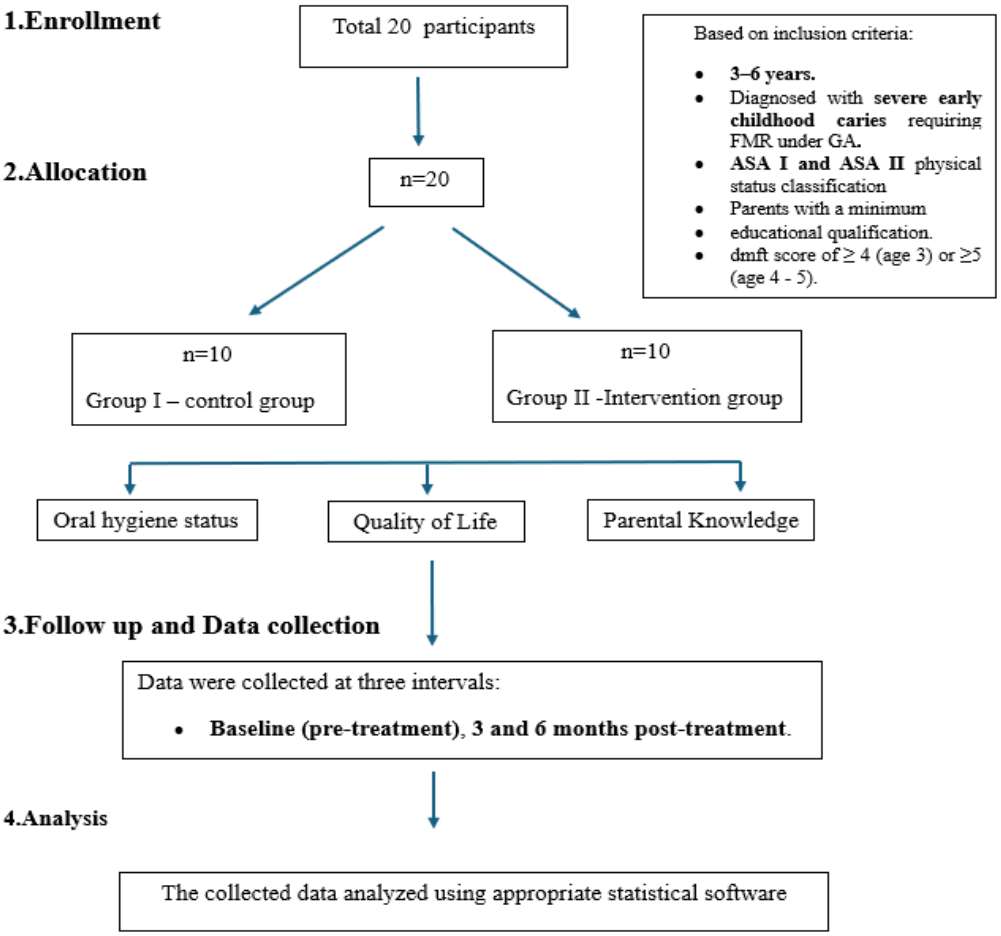
- Patients or guardians not willing to participate.
- Complete absence of anterior teeth.
- Children with ASA III and IV physical status classification and those with with special health care needs.
- Parents with previous participation MI within past 6 months.
- Children with chronic systemic disease, long term medication.
- Children requiring emergency dental treatment.

Randomization and Allocation:

Participants were randomly assigned into two groups using simple randomization methods such as lottery method.

Allocation concealment was done using alternation technique. The trial followed the Consolidated Standards of

Figure 1: Consort Diagram



Reporting Trials guidelines [Figure 1].

- **Group I (Control Group):** 10 participants
- **Group II (Intervention Group):** 10 participants

Both the participants and the investigator were blinded to minimize bias.

Intervention Protocol:

Group I – Control Group

Participants in the control group received:

Verbal oral hygiene instructions.
Pamphlet containing oral hygiene Instructions.
Group II – Intervention Group
Participants in the intervention group received:
Motivational Interviewing (MI) directed at parents.
Use of audiovisual aids.
Verbal oral hygiene instructions.
Pamphlet containing oral hygiene guidelines.
Outcome Measures:
Primary Outcome
Oral health status.
Secondary Outcomes
Oral health-related quality of life (OHRQoL).
Parental knowledge regarding oral health.
Assessment Tools:
Oral Health Status: Oral Hygiene Index – Simplified.
Quality of Life: Evaluated using Early Childhood Oral Health Impact Scale (ECOHIS) – Preschool version [11]
Parental Knowledge: Assessed using a validated questionnaire (Azadeh et al.) [12]
Data Collection and Follow-Up:
Data were collected at three intervals:

- Baseline (pre-treatment)
- 3 months post-treatment
- 6 months post-treatment

Statistical Analysis:
The collected data were entered and analyzed using appropriate statistical software (SPSS software 27). Difference between age and gender were done using chi square use; intra group comparison among same OHI group between intervention and control group tested using Wilcoxon rank sign test and inter comparison of both intervention and control group done using Friedman test. A p-value < 0.05 will be considered statistically significant.

RESULTS

Baseline Characteristics
A total of 20 participants were included, with 10 subjects each in the intervention (motivational interviewing) and control groups. The distribution of age and gender between the two groups was comparable, with no statistically significant difference (p > 0.05). A higher proportion of younger children (0–3 years) was observed in the control group (60%) compared to the intervention group (20%), this difference was not statistically significant (p = 0.174). The gender distribution showed a higher proportion of males in the intervention group (70%) and females in the control group (70%); however, this difference was also not statistically significant (p = 0.074) [Table:1] [Figure 2].

Table 1. Baseline characteristics

		INTERVENTION(n=10)		CONTROL(n=10)		p-VALUE*
AGE	0-3 YRS	2	20.0%	6	60.0%	0.174
	3-4YRS	3	30.0%	1	10.0%	
	5-6YRS	5	50.0%	3	30.0%	

GENDER	MALE	7	70.0%	3	30.0%	0.074
	FEMALE	3	30.0%	7	70.0%	

*Chi square

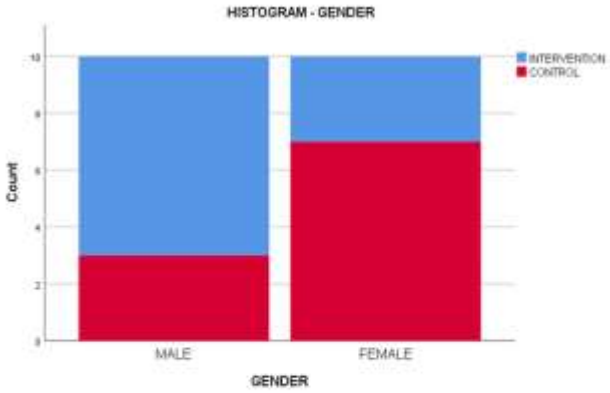


Figure 2: shows gender distribution among intervention and control group

Oral Hygiene Status (OHI-S)

Both groups demonstrated a statistically significant improvement in oral hygiene scores over time ($p < 0.01$). In the intervention group, the mean OHI-S score reduced from baseline to 3 months and slightly increased at 6 month [Figure 3]. The control group showed a reduction from baseline to 3 months and at 6 months [Figure 4]. Both groups showed significant improvement following full mouth dental rehabilitation, the intervention group exhibited a slightly better reduction at the 3-month interval. The difference between groups at 6 months appeared minimal

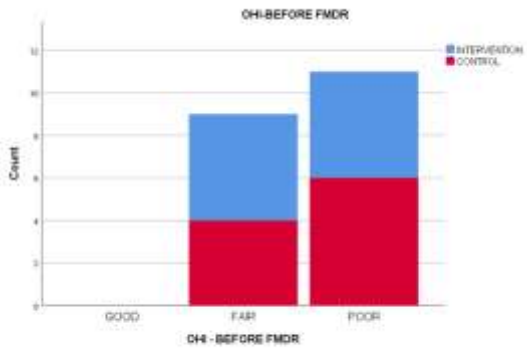


Figure 3: shows oral hygiene index status before full mouth dental rehabilitation

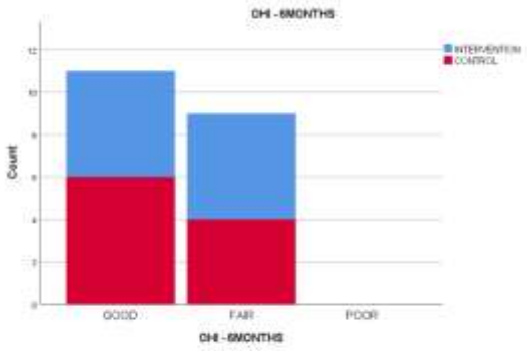


Figure 4: shows oral hygiene index status at 6 month follow up after full mouth dental rehabilitation

Parental Knowledge

Parental knowledge scores showed statistically significant changes over time in both groups (p = 0.001). In the intervention group, there was improvement from baseline to 3 months and at 6 months. The control group scores decreasing from baseline to 3 months, followed by increase at 6 months [Table:2].

Oral Health-related Quality of Life (POQL-PS)

Quality of life scores improved significantly in both groups over time (p = 0.001). In the intervention group, POQL scores improved from baseline to 3 months followed by a substantial reduction at 6 months, indicating better quality of life. Similarly, the control group showed improvement from baseline to 3 months and at 6 months. Although both groups reached similar outcomes at 6 months, the intervention group started with better baseline scores and shows a consistent trend toward improvement, suggesting that motivational interviewing may contribute to earlier enhancement in perceived quality of life [Table:2]

Table 2. Measurement of Oral hygiene scores, Parental knowledge and Quality of life (POQL-PS) scores between the intervention and control groups.

		BEFORE FMDR (Mean)	3 MONTHS (Mean)	6 MONTHS (Mean)	p-VALUE*
OHI	INTERVENTION	2.80	1.55	1.65	0.003
	CONTROL	2.80	1.60	1.60	0.002
Parents knowledge	INTERVENTION	2.75	2.97	4.00	0.001
	CONTROL	5.90	2.91	7.00	0.001
Quality of life (POQL-PS)	INTERVENTION	2.25	2.84	1.00	0.001
	CONTROL	5.05	2.87	1.00	0.001

*Friedman Test

Correlation Analysis

- No significant correlation between oral hygiene status and parental knowledge (ρ = 0.058, p = 0.808)
- No significant correlation between oral hygiene status and quality of life (ρ = –0.234, p = 0.320)
- A statistically significant moderate-to-strong inverse correlation between parental knowledge and quality of life (ρ = –0.592, p = 0.0059) [Table:3].

Table 3. Baseline Correlations (All Participants)

Variable Pair	Spearman ρ	p-value	Interpretation
OHI – Parental knowledge	0.058	0.808	No correlation
OHI- Quality of life	–0.234	0.320	Weak inverse, NS
PK - Quality of life	–0.592	0.0059	Moderate–strong inverse, significant

Interpretation

1. Higher parental knowledge at baseline is significantly associated with better OHRQoL (lower score means better QoL).
2. No significant baseline relationship between:
   - OHI and parental knowledge.
   - OHI and OHRQoL.

DISCUSSION

The present randomized controlled interventional trial evaluated the effect of motivational interviewing (MI) on oral hygiene status, parental knowledge, and oral health-related quality of life (OHRQoL) among children who underwent full mouth dental rehabilitation (FMDR) under general anesthesia. The findings of the present study demonstrated that both the intervention and control groups showed significant improvement following treatment; however, children whose parents received motivational interviewing exhibited more consistent and stable behavioral improvements over time.

Oral Hygiene Status:

In the present study, oral hygiene scores improved significantly in both groups from baseline to the 3 and 6-month follow-up periods. The intervention group demonstrated a slightly greater reduction in OHI-S scores at the 3-month interval compared with the control group, suggesting that motivational interviewing may positively influence early oral hygiene behavior.

These findings are comparable to the observations reported by Weinstein et al., [13] who demonstrated that motivational interviewing provided to caregivers significantly reduced the occurrence of early childhood caries and improved preventive oral health behaviors in children. In the same way, Ismail et al. [14] reported that MI-based counseling was more effective than conventional health education in improving parental compliance with oral hygiene instructions and dietary practices.

The improvement observed in both groups may largely be attributed to the effects of full mouth dental rehabilitation itself, which eliminates active disease and improves oral comfort. However, the comparatively better short-term outcomes seen in the intervention group indicate that behavioral interventions may enhance parental motivation and adherence to oral hygiene practices. The minimal difference observed between groups at 6 months in the present study may be due to the small sample size and limited follow-up duration. Similar findings were reported by Harrison et al., [15] who noted that the effectiveness of motivational interviewing tends to decline over time unless reinforcement sessions are provided periodically.

Parental Knowledge:

A significant improvement in parental knowledge scores was observed in the intervention group throughout the study period, whereas the control group showed fluctuations in scores over time. This suggests that motivational interviewing may contribute not only to knowledge but also to better retention and understanding of oral health information.

These results are in accordance with the findings of Naidu et al. and Freudenthal & Bowen [16,17] who reported that motivational interviewing enhances parental self-efficacy and promotes long-term behavioral commitment. Conventional oral health education methods are often directive and information-centered, whereas MI emphasizes empathy, collaboration, and individualized goal setting, thereby improving caregiver engagement and intrinsic motivation.

The present findings further support the concept that parental behavior and awareness play a major role in maintaining oral health in young children. Since children in the preschool age group are highly dependent on caregivers for oral hygiene maintenance and dietary practices, improved caregiver understanding may directly influence oral health outcomes.

Oral Health-Related Quality of Life:

Both groups demonstrated significant improvement in OHRQoL scores following treatment, indicating that FMDR

under general anesthesia effectively relieved pain, restored oral function, and improved the child's daily well-being. However, the intervention group demonstrated a more consistent improvement trend across the follow-up period. These findings are similar to studies conducted by Jankauskienė et al. and Amin et al., [18,19,20] who reported marked improvements in children's quality of life following comprehensive dental rehabilitation under general anesthesia. The additional benefit observed with motivational interviewing in the present study may be related to improved home-care practices, enhanced parental involvement, and reduced recurrence of poor oral hygiene behaviors. The present study demonstrated a statistically significant inverse correlation between parental knowledge and OHRQoL scores, indicating that higher parental knowledge was associated with better quality of life outcomes in children.

The findings of the present study are generally consistent with previous literature supporting the effectiveness of motivational interviewing. Most earlier studies have reported that MI improves preventive behaviors, parental compliance, and oral health practices rather than producing immediate dramatic clinical changes. Similarly, the present study demonstrated that motivational interviewing had a greater impact on behavioral and knowledge-related outcomes than on clinical oral hygiene differences alone.

Unlike some previous studies with larger sample sizes and longer follow-up periods, the present study showed only minimal intergroup differences at 6 months. This may be due to the relatively small sample size (n = 20), short follow-up duration, and the strong immediate impact of FMDR itself, which may have masked subtle long-term behavioral differences between groups.

CLINICAL IMPLICATIONS

The findings of the present study highlight the importance of integrating behavioral counseling strategies into pediatric dental treatment protocols. While operative treatment under general anesthesia effectively manages existing disease, long-term success depends largely on caregiver behavior and maintenance of preventive practices at home.

Motivational interviewing may therefore serve as an effective adjunct to conventional oral health education by:

- Enhancing parental motivation and participation.
- Improving adherence to oral hygiene instructions.
- Encouraging positive dietary and preventive behaviors.
- Supporting long-term maintenance of oral health outcomes.

LIMITATIONS

The present study had certain limitations. The sample size was relatively small, limiting the generalizability of the findings. The follow-up duration was limited to six months, which may not adequately assess long-term sustainability of behavioral changes. Additionally, parental responses in knowledge and quality-of-life questionnaires may have been influenced by reporting bias.

Future studies with larger populations, multicenter designs, and longer follow-up periods are recommended to further evaluate the long-term effectiveness of motivational interviewing following dental rehabilitation under general anesthesia.

CONCLUSION

Motivational interviewing appears to be an effective adjunct to conventional oral health education in improving parental knowledge and early oral hygiene outcomes in children undergoing full mouth dental rehabilitation under general anesthesia.

Although both groups showed significant improvements, the intervention group demonstrated more consistent and stable behavioral changes. Incorporating motivational interviewing into pediatric dental practice may enhance long-

term treatment success and improve quality of life.

REFERENCES

1. Gonzalez J. A Prevention Strategy for Children Receiving Full Mouth Dental Rehabilitation Under General Anesthesia: A Randomized Controlled Trial. Int J Paediatr Dent. 2025; 35:259–267.
2. American Academy of Pediatric Dentistry. Policy on hospitalization and operating room access for oral care of infants, children, adolescents, and individuals with special health care needs. The Reference Manual of Pediatric Dentistry. American Academy of Pediatric Dentistry; 2022:144-145.
3. Filstrup SL, Briskie D, da Fonseca M, Lawrence L, Wandera A, Inglehart MR. Early childhood caries and quality of life: child and parent perspectives. Pediatr Dent. 2003;25(5):431-440.
4. American Academy of Pediatric Dentistry. Policy on Medically- Necessary Care. The Reference Manual of Pediatric Dentistry. American Academy of Pediatric Dentistry; 2022:23-28.
5. Coolidge T, Skaret E, Heima M, et al. Thinking about going to the dentist: a contemplation ladder to assess dentally- avoidant individuals' readiness to go to a dentist. BMC Oral Health. 2011;11(1):4.
6. Pine CM, Adair PM, Burnside G, et al. Dental RECUR random ized trial to prevent caries recurrence in children. J Dent Res. 2020;99(2):168-174.
7. Acharya S. Motivational interviewing in pediatric dentistry: role in behavior management. Journal of South Asian Association of Pediatric Dentistry. 2019;2(2):69-72.
8. Uguz HN, Çiftçi V, Dogan MC. Effectiveness of motivational interviewing on oral healthcare in pediatric patients. Journal of Clinical Pediatric Dentistry. 2023 Sep 1;47(5).
9. American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): classifications, consequences, and preventive strategies. Pediatr Dent. 2023;45(6):79-82.
10. Wu L, Gao X, Lo ECM, Ho SMY, McGrath C, Wong MCM. Motivational interviewing to promote oral health in adolescents. Journal of Adolescent Health. 2017; 61: 378–384.
11. Chai HH, Gao SS, Chen KJ, Lo EC, Duangthip D, Chu CH. Tools evaluating child oral health–related quality of life. international dental journal. 2024 Feb 1;74(1):15-24.
12. Babaei A, Pakdaman A, Hessari H, Shamshiri AR. Oral health of 6–7-year-old children according to the Caries Assessment Spectrum and Treatment (CAST) index. BMC oral health. 2019 Jan 17;19(1):20.
13. Weinstein P, Harrison R, Benton T. Motivating parents to prevent caries in their young children: one-year findings. J Am Dent Assoc. 2004;135(6):731-738.
14. Ismail AI, Ondersma S, Jedele JM, Little RJ, Lepkowski JM. Evaluation of a brief tailored motivational intervention to prevent early childhood caries. Community Dent Oral Epidemiol. 2011;39(5):433-448.
15. Harrison R, Benton T, Everson-Stewart S, Weinstein P. Effect of motivational interviewing on rates of early childhood caries: a randomized trial. Pediatr Dent. 2007;29(1):16-22.
16. Freudenthal JJ, Bowen DM. Motivational interviewing to decrease parental risk-related behaviors for early childhood caries. J Dent Hyg. 2010;84(1):29-34.
17. Naidu RS, Nunn JH, Kelly A. Socio-behavioural factors and early childhood caries: a cross-sectional study of preschool children in Trinidad. BMC Oral Health. 2013; 13:30.
18. Amin MS, Harrison RL, Weinstein P. A qualitative look at parents' experience of their child's dental general anaesthesia. Int J Paediatr Dent. 2006;16(5):309-319.
19. Jankauskienė B, Narbutaitė J, Kubilius R, Gleiznys A. Changes in oral health-related quality of life among children following dental treatment under general anesthesia. A systematic review. Stomatologija. 2014;16(2):60-64.
20. Amin M, Nouri R, ElSalhy M, Shah PS, Azarpazhooh A. Caries recurrence after treatment under general anesthesia for early childhood caries: a retrospective cohort study. Eur Arch Paediatr Dent. 2015;16(4):325-331.