

THE COMPARISON OF EFFECT OF MOTIVATIONAL INTERVIEWING AND DENTAL HEALTH EDUCATION ON ORAL HEALTHCARE KNOWLEDGE, ATTITUDES AND BEHAVIOUR OF PARENTS AND CAREGIVERS OF PRESCHOOL CHILDREN

Dentistry

Dr. Sansrati Jain Post graduate, People's Dental Academy.

Dr Ankur Jain Professor and HOD, People's Dental Academy.

Dr Rinky Sisodia Professor, People's Dental Academy.

Dr Satish Maron Professor, People's Dental Academy.

Dr Anaya Kulkarni Reader, People's Dental Academy.

Dr Krishna Sagar Reader, People's Dental Academy.

ABSTRACT

Introduction- Motivational Interviewing (MI) has been used in healthcare and has shown reduction in the prevalence of early childhood caries (ECC) in preschool children. The aim of this study was to assess the effect of an MI approach delivered in an individual-setting as part of the regular dental appointment, on parent /caregiver oral health knowledge and attitudes toward the oral health of their children, in contrast with traditional dental health education (DHE), in an exploratory community-based study. **Method-** The design of this study included 60 parents and caregivers visiting People's university (Bhopal) and were randomly assigned to Motivational interviewing(MI) group or Dental health education(DHE) group(30 in each group). Parents and caregivers in the MI-group (n = 30) received a talk on dental health using an MI approach and the DHE-group (n = 30) received a talk using traditional DHE. Both groups received additional, written dental health information and also received two telephone call follow-ups as part of the protocol at 3 months and 6 months. Both groups were given questionnaires before the talks and 3 months and 6 months later. Question items included oral health knowledge, attitudes, brushing behaviour, and a specific instrument to assess 'readiness for change', the Readiness Assessment of Parents Concerning Infant Dental Decay (RAPIDD). **Result-** Both the groups were equally effective in raising the awareness amongst the parents of the children seeking dental care. Intra-group comparison scores of individual items revealed that the scores obtained by participants belonging to group A and group B did not differ significantly between the visits. **Conclusion-** Motivational interviewing and Dental Health Education have similar effects when used as a part of regular dental appointment.

KEYWORDS

INTRODUCTION

Parents and caregivers are considered responsible for the oral healthcare of children, therefore their oral health knowledge and attitudes directly, or indirectly, influence child's oral health.¹

Motivational interviewing (MI) is an approach for helping people to change. It was originally developed by William R. Miller and Stephen Rollnick and had a remarkable impact on research and practice on individuals with substance abuse problem and health-related problems in the United States and many other countries.²

Despite a sizable body of evidence from medical research, the potential of MI in dental health care is not well understood.⁴

The aim of this study was to assess the effect of an MI approach delivered in a individual-setting, on parent /caregiver oral health knowledge and attitudes toward the oral healthcare of their preschool children, by contrast with traditional dental health education (DHE), in an exploratory community-based study, where both techniques were used as an extension of regular dental appointment⁵.

The spirit of motivational interviewing	Authoritative or paternalistic therapeutic style
Collaboration: a partnership between the patient and practitioner is formed. Joint decision making occurs. The practitioner acknowledges the patient's expertise about themselves	Confrontation: the practitioner assumes the patient has an impaired perspective and consequently imposes the need for 'insight'. The practitioner tries to persuade and coerce a patient to change
Evoacation: the practitioner activates the patient's own motivation for change by evoking their reasons for change. The practitioner connects health behaviour change to the things the patient cares about	Education: the patient is presumed to lack the insight, knowledge or skills required to change. The practitioner tells the patient what to do
Honouring a patient's autonomy: although the practitioner informs and advises their patient, they acknowledge the patient's right and freedom not to change. 'It's up to you'	Authority: the practitioner instructs the patient to make changes

Adapted from Miller and Rollnick, 2002

OBJECTIVES

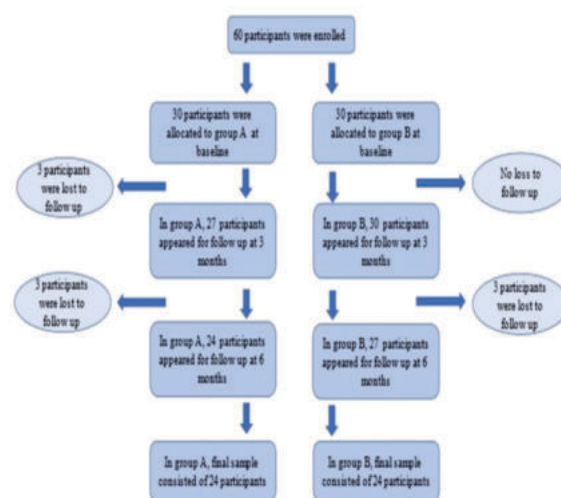
- To assess the effect of MI on participants' oral health knowledge, beliefs and attitudes for a period of 6 months
- To assess the effect of DHE on participants' oral health knowledge, beliefs and attitudes for a period of 6 months
- To compare the effectiveness of MI compared to DHE in changing caregiver's attitude towards oral health
- To categorise the caregivers receiving MI into 3 groups (contemplative, preparation, action) and assess their readiness to change by RAPIDD scale

METHOD

Sample Selection

Data was analysed using SPSS (Statistical Package for Social Sciences) 21.0 version. Data was analysed for probability distribution using Kolmogorov-smirnov test, p value <.05 indicated that the data was not normally distributed and thus, non-parametric test of significance were applied. P value <.05 was considered statistically significant.

Patient caregivers, who were willing to participate in the study, visiting the department of pediatric and preventive dentistry (Bhopal) were selected.



Dental Health Education Group

All participants (parents and caregivers) were given a 15-20 -min talk on dental care of their children's teeth by a Dentist. This discussion included advice on diet, oral hygiene, fluoride use and visit to hospital. At the end of the discussion, participants were given a DHE leaflet to take home.

Motivational Interviewing Group

Participants in the group received a dental discussion based on a

Motivational Interviewing approach, delivered by a Dentist trained in motivational interviewing. Training of the MI educator involved a one-day course (8 h) on Motivational Interviewing.

The discussion was based on an MI protocol designed to understand oral health information to families with young children: Motivate your Dental Patient: A workbook -Public Health / Paediatric Edition⁶. All participants in the test group received the DHE leaflet too.

All the talks took place in the department

Details of the MI group-talk

The MI provider discussed concern of parent/caregiver about their child's oral health and their goals for oral healthcare (using open-ended questions and affirming positive efforts). Questions were based around the following topics: Eliciting and enhancing commitment to change, identifying potential problems, and recognizing resistance to change. OARS: The Basic Skills Of Motivational Interviewing⁷

Ask Open-ended questions* • The patient does most of the talking • The practitioner can learn more about what the patient cares about (eg. their values and goals)	Example I understand you have some concerns about your child's oral health, Can u tell me about them? Versus Are you anxious about your child's teeth
Make Affirmations • In the form of praises or words of appreciation and empathetic • Helps build connection and validate and support the patient during the process of change	Example I appreciate that you took courage to bring your child for dental check-up. It appears you must have gone through a lot of difficulties maintaining child's oral health.
Use Reflections* • Involves retelling a statement to capture the implied meaning or feeling of a patient's statement • Encourages continual personal exploration and helps people understand their motivations more fully	You enjoy when you child is happy with the sugary treats that you give them and it's easy to communicate with them when they are in a good mood. You dint feel it was so harmful until recently when you started seeing dental decay or child started complaining of pain.
Use Summarising • Make sure mutual understanding of discussion • Point out inconsistencies between the person's current situation and future goals	Just let me make sure that I understand everything that we've been discussing so far. You are worried about the amount of sugary treats your child has each day and how it is affecting his health in general and teeth in particular. But the few times you've tried to improve your child's habits have not been easy, and you are worried that you can't stop. How am I doing?

* A general rule-of-thumb in MI practice is to ask an open-ended question, followed by 2–3 reflections

Four further principles of motivational interviewing used during discussions⁸

Express empathy The practitioner tries to understand the patient's perspective, thoughts and feelings without judging, criticising or blaming.
Develop discrepancy Assisting patients and their parents to identify discrepancies between their current behaviour and future goals or values about themselves as a person is a powerful motivator.
Roll with resistance MI uses strategies such as simple reflection of the resistance, emphasising the individual's choice to change or not ('it's up to you'), shifting the focus of the discussion or simply reframing what the person has said, in order to lower resistance to opening up to discussion
Support self-efficacy By promoting self-efficacy, the practitioner can help the individual develop the confidence that they are capable of change

Telephone Follow-up

Patients were provided with a contact number of the dentist providing

DHE and MI.

A telephonic follow up at 3 and 6 months was scheduled where they would be asked to rate the RAPIDD scale again. The telephone follow-up was undertaken by a dentist itself who had taken DHE and MI discussions.

Questions included in the telephone follow-up were the following: *"I am calling talk about the oral health goals."* *"Let's go over parts that are not working, sometimes a small adjustment can make a big difference"* *"Another mother I spoke to, had a similar issues...she tried (insert example)...it seemed to work for her family...you are the expert on your family, what do you think?"*⁹

Instruments

At baseline, 3 months and 6 months later, parents and caregivers were asked to complete a oral health questionnaire

- The Readiness Assessment of Parents Concerning Infant Dental Decay (RAPIDD)

The Readiness Assessment of Parents Concerning Infant Dental Decay (RAPIDD) was developed by Weinstein and Reidy⁹. Based on the Trans theoretical /stages of change model (TTM), this tool was planned to measure parent/caregiver 'readiness for change'. Using four constructs: Openness to Health Information, Valuing Dental Health, Convenience and Change Difficulty, and Child Permissiveness, RAPIDD challenges to assess whether the parent/ caregiver is at one of the following stages: contemplative, preparing for action, action with respect to their child's oral healthcare. The RAPIDD instrument was validated in a study among families with young children (age 6 to 36 months) in the US Commonwealth of the Northern Mariana Islands, in the Pacific¹⁰. For use in the present study, the instrument was assessed for face validity and adapted for use with a somewhat older age-group (3 to 5 years). This included restatement of questions relating to bottle-use. Table 3 shows the four RAPIDD constructs and corresponding construct items. Within the questionnaire, these items are not themed by construct but listed as statements and the participant is asked to agree with on a 5-point Likert scale (5 = Strongly Agree, 4 = Agree, 3 = Neither agree nor disagree, 2 = Disagree, 1 = Strongly Disagree). Mean scores are derived for each of the four RAPIDD constructs.

Table 3 Modified RAPIDD constructs

Construct	Construct items
Openness to health information	• I would take my child off the bottle if a healthcare professional told me to do so • I get advice on taking care of my baby from TV, radio, magazines and internet. • I feel comfortable asking a healthcare professional about ways to care for my child. • It is easier for me to get answers about ways to take care of my child from the healthcare professional
Valuing Dental Health	• Keeping my child's teeth healthy is important to me. • My child benefits a lot when I clean his/her teeth. • I like the idea of a dentist or dental nurse putting fluoride on my child's teeth to protect them from cavities. • I believe using fluoride toothpaste every day would help my child's teeth.
Convenience and Change Difficulty	• It would be hard to give my child less sweets. • My child gives me a hard time when I try to brush his/her teeth. • It is not easy to use fluoride toothpaste every day. • I am unable to put my child to sleep without feeding him/her.
Child Permissiveness	• Food and drinks that are not sweet don't taste good to my child. • I feel like a bad parent if I don't give my child sweets. • My child is happier when I give him/her something sweet in the bottle. • I makes me feel good to give my child something sweet to eat.

RESULTS

The median score of the response to each item of the scale/questionnaire has been described in table 1.

Inter-group comparison of the scores of individual items revealed that the scores obtained by participants belonging to two groups did not differ significantly (p value >.05), similarly median of average scores of individual sections also did not differ significantly. The overall scores were also found to differ non-significantly between the groups. This indicated that both the groups were equally effective in raising the awareness amongst the parents of the children seeking dental care. [Table 2]

Intra-group comparison scores of individual items revealed that the scores obtained by participants belonging to group A did not differ significantly between the visits (p value >.05). Similarly, scores of individual items revealed that the scores obtained by participants belonging to group B did not differ significantly between the visits (p value >.05). This indicated that the either of the methods of education were ineffective in raising the awareness amongst the parents of the children seeking dental care. [Table 2]

Table 1. Description Of Median Scores Assigned To Each Question Based On The Response Of The Participants.

Group A (Dental Health Education)				Group B (Motivational Interviewing)			
Section 1				Section 1			
		Median	Inter-quartile			Median	Inter-quartile
Question 1	1 st visit	4.0	2.0-5.0	Question 1	1 st visit	4.0	2.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	2.0-5.0
	3 rd visit	4.0	3.25-5.0		3 rd visit	4.0	3.0-5.0
Question 2	1 st visit	4.0	2.0-5.0	Question 2	1 st visit	4.0	2.0-5.0
	2 nd visit	4.0	2.0-5.0		2 nd visit	4.0	2.0-5.0
	3 rd visit	4.0	3.0-5.0		3 rd visit	4.0	3.0-5.0
Question 3	1 st visit	4.0	2.0-5.0	Question 3	1 st visit	4.0	2.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	3.0-5.0		3 rd visit	4.0	3.0-5.0
Question 4	1 st visit	4.0	2.0-5.0	Question 4	1 st visit	4.0	3.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	3.0-5.0		3 rd visit	4.0	3.0-5.0
Average	1 st visit	4.25	2.1875-4.5	Average	1 st visit	4.5	2.0-4.75
	2 nd visit	4.5	2.25-4.5		2 nd visit	4.25	2.5-4.5625
	3 rd visit	4.5	3.125-4.6875		3 rd visit	4.5	3.0-4.5
Section 2				Section 2			
		Median	Inter-quartile			Median	Inter-quartile
Question 1	1 st visit	4.0	2.75-5.0	Question 1	1 st visit	4.0	2.75-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	4.0-5.0		3 rd visit	4.0	4.0-5.0
Question 2	1 st visit	4.0	2.0-5.0	Question 2	1 st visit	4.0	2.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	2.0-5.0
	3 rd visit	4.5	4.0-5.0		3 rd visit	4.0	4.0-5.0
Question 3	1 st visit	4.0	2.0-5.0	Question 3	1 st visit	4.0	2.0-5.0
	2 nd visit	5.0	3.0-5.0		2 nd visit	4.5	3.0-5.0
	3 rd visit	5.0	3.0-5.0		3 rd visit	5.0	3.0-5.0
Question 4	1 st visit	4.0	3.0-5.0	Question 4	1 st visit	4.0	3.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	3.0-5.0		3 rd visit	4.0	3.0-5.0
Average	1 st visit	4.25	2.5-4.5625	Average	1 st visit	4.25	2.5-4.5
	2 nd visit	4.5	2.75-4.75		2 nd visit	4.37	2.6875-4.75
	3 rd visit	4.25	4.0-4.6875		3 rd visit	4.5	3.5-4.75
Section 3				Section 3			
		Median	Inter-quartile			Median	Inter-quartile
Question 1	1 st visit	4.0	3.0-5.0	Question 1	1 st visit	4.0	3.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	3.0-4.75		3 rd visit	4.0	2.0-5.0
Question 2	1 st visit	4.0	3.0-5.0	Question 2	1 st visit	4.0	3.0-5.0
	2 nd visit	4.0	3.0-5.0		2 nd visit	3.5	3.0-5.0
	3 rd visit	3.0	2.25-5.0		3 rd visit	3.0	2.0-5.0
Question 3	1 st visit	4.0	2.0-5.0	Question 3	1 st visit	4.0	2.0-5.0
	2 nd visit	3.0	2.0-5.0		2 nd visit	3.0	2.75-5.0
	3 rd visit	3.0	2.0-4.0		3 rd visit	3.0	2.0-5.0
Question 4	1 st visit	4.5	2.75-5.5	Question 4	1 st visit	4.5	3.0-5.0
	2 nd visit	4.0	2.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	4.0	2.0-5.0		3 rd visit	4.0	2.0-5.0
Average	1 st visit	4.25	2.6875-4.75	Average	1 st visit	4.25	2.5-4.75
	2 nd visit	4.25	2.75-4.5		2 nd visit	4.0	2.6875-4.5625
	3 rd visit	4.0	2.375-4.4375		3 rd visit	4.0	2.25-4.5
Section 4				Section 4			
		Median	Inter-quartile			Median	Inter-quartile
Question 1	1 st visit	4.0	2.0-5.0	Question 1	1 st visit	4.0	2.0-5.0
	2 nd visit	4.0	2.0-5.0		2 nd visit	4.0	2.0-5.0
	3 rd visit	4.0	2.0-4.0		3 rd visit	4.0	2.0-4.0
Question 2	1 st visit	4.0	3.0-5.0	Question 2	1 st visit	4.0	2.75-5.0
	2 nd visit	3.0	2.0-5.0		2 nd visit	3.0	2.0-5.0
	3 rd visit	3.0	2.25-4.0		3 rd visit	3.0	2.0-5.0
Question 3	1 st visit	4.0	3.0-5.0	Question 3	1 st visit	4.0	2.75-5.0
	2 nd visit	4.0	2.0-5.0		2 nd visit	4.0	3.0-5.0
	3 rd visit	3.5	2.0-5.0		3 rd visit	3.0	2.0-5.0

Question 4	1 st visit	4.0	3.0-5.0	Question 4	1 st visit	4.0	2.75-5.0
	2 nd visit	3.0	3.0-5.0		2 nd visit	4.0	2.0-5.0
	3 rd visit	3.0	3.0-4.75		3 rd visit	3.0	2.0-5.0
Average	1 st visit	4.25	2.5-4.5	Average	1 st visit	4.125	2.25-4.5
	2 nd visit	3.75	2.5-4.5		2 nd visit	4.0	2.5-4.5
	3 rd visit	4.0	2.25-4.25		3 rd visit	4.0	2.25-4.5

Table 2. Inter-group Comparison Of Median Average Scores Of Participants Belonging To Two Groups.

Section 1							
		Group A		Group B		Inter-group comparison	
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.25	2.1875-4.5	4.5	2.0-4.75	-.464	>.05
Visit 2		4.5	2.25-4.5	4.25	2.5-4.5625	-.860	>.05
Visit 3		4.5	3.125-4.6875	4.5	3.0-4.5	-.316	>.05
Intra-group comparison	Chi-square value	3.225		.697			
	P value ^a	>.05		>.05			
Section 2							
		Group A		Group B		Inter-group comparison	
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.25	2.5-4.5625	4.25	2.5-4.5	-.201	>.05
Visit 2		4.5	2.75-4.75	4.375	2.6875-4.75	-.024	>.05
Visit 3		4.25	4.0-4.6875	4.5	3.5-4.75	-.153	>.05
Intra-group comparison	Chi-square value	1.462		1.506			
	P value ^a	>.05		>.05			
Section 3							
		Group A		Group B			
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.25	2.6875-4.75	4.25	2.5-4.75	-.186	>.05
Visit 2		4.25	2.75-4.5	4.0	2.6875-4.5625	-.257	>.05
Visit 3		4.0	2.375-4.4375	4.0	2.25-4.5	-.190	>.05
Intra-group comparison	Chi-square value	4.247		.887			
	P value ^a	>.05		>.05			
Section 4							
		Group A		Group B			
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.25	2.5-4.5	4.125	2.25-4.5	-.104	>.05
Visit 2		3.75	2.5-4.5	4.0	2.5-4.5	-.177	>.05
Visit 3		4.0	2.25-4.25	4.0	2.25-4.5	-.133	>.05
Intra-group comparison	Chi-square value	3.852		2.227			
	P value ^a	>.05		>.05			

Overall (Pros)							
		Group A		Group B			
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.3125	2.2188-4.5000	4.375	2.25-4.625	-0.334	>.05
Visit 2		4.5	2.5-4.625	4.4375	2.5-4.6563	-0.024	>.05
Visit 3		4.375	3.7813-4.5938	4.375	3.0-4.625	-0.038	>.05
Intra-group comparison	Chi-square value	2.022		1.520			
	P value ^a	>.05		>.05			
Overall (cons)							
		Group A		Group B			
		Median	Inter-quartile range	Median	Inter-quartile range	Z value	P value ^a
Visit 1		4.1250	2.6250-4.6250	4.25	2.5625-4.625	-0.015	>.05
Visit 2		4.125	2.5-4.5	4.0625	2.5-4.375	-0.329	>.05
Visit 3		4.0	2.1875-4.375	4.0	2.125-4.375	-0.009	>.05
Intra-group comparison	Chi-square value	5.407		3.204			
	P value ^a	>.05		>.05			

^aMan-whitney U test. ^bFriedman test.

DISCUSSION

Poor oral health in early childhood is a serious public health problem¹¹. Family level influences are facilitated primarily through parents and caregivers with whom preschool children spend maximum of their time. During this period of primary socialisation, routine dietary and health behaviours are directly and indirectly influenced by the oral health knowledge, attitudes, beliefs and practices of parents and caregivers¹⁵. Multilevel influence on children's oral health at the individual, family and community levels have been proposed in the conceptual model of Fisher-Owens et al¹⁴.

A more recent, qualitative study also found that although parents and caregivers of young children had generally positive attitudes to oral health, they reported encountering several barriers to accessing preventive care for their child with respect to maintaining healthy diets, good oral hygiene and regular dental attendance¹³.

In this study, the motivational interviewing technique of behaviour modification was done in the regular clinical setting along with the regular dental health education provided by a dentist.

Motivational interviewing (MI) is an effective therapy method that boosts motivation through the resolution of unsureness¹⁴. Miller and Rollnick defined MI as "a client-centred directive method for improving intrinsic motivation to change by exploring and resolving unsureness"¹⁵. Reinforcements at frequent and regular intervals are very important in interviewing techniques to maintain the motivation to change and to resolve ambivalence on different levels. A study similar to this was done on parents and caregivers of preschool children in Trinidad with a follow-up interval of 2 weeks, one month and 4 months. The study showed betterment in the attitude of parents and caregivers towards knowledge and belief in dental health¹⁶. Shorter intervals for reinforcement of knowledge are a major point for the success of that study. Also as the sample of the previous study was based in a school setting, the sample had a variety of motivation levels in the caregivers regarding the oral health of their children.

CONCLUSION

Knowledge about oral health and the correct way for its maintenance is an important habit, which should be developed in early childhood. Motivational interviewing is a better way to elicit change in behaviour

than regular dental health education. But this technique requires frequent reinforcements and resolution of barriers to change, which is quite difficult to achieve in a regular clinical setting. Improvements should be made during the clinical hours by a person trained in motivational interviewing to involve a counselling session along with a dental appointment to help change the perspective and knowledge of future generations towards oral health.

REFERENCES

1. Tinanoff N, Daley NS, O-Sullivan DM, Douglass JM. Failure of intense preventive efforts to arrest early childhood and rampant caries: three case reports. *Paed Dent*. 1999;21:160-3.
2. Weinstein P. Motivational interviewing concepts and the relationship to risk management and patient counselling. *J Cal Dent Association*. 2011;39:742-5.
3. Yevlakhova D, Satur J. Models for individual oral health promotion and their effectiveness: a systematic review. *Austr Dent J*. 2009;54:190-7.
4. Ramos-Gomez F, Crystal YO, Domejean S, Featherstone JDB. Minimal intervention dentistry: part 3. Paediatric dental care - prevention and intervention protocols using caries risk assessment for infants and young children. *Br Dent J*. 2012;213:501-8.
5. Noordman J, van der Weijden T, van Dulman S. Communication-related behaviour change techniques used in face-to-face lifestyle interventions in primary care: A systematic review of the literature. *Patient Ed Counselling*. 2012;89:227-44.
6. Michie S, Richardson M, Johnston M, Abraham C, Francis J, Hardeman W, et al. The Behaviour Change technique (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Ann Behav Med*. 2013;46:46-81.
7. Miller W, Rollnick S. *Motivational Interviewing: Helping People Change*. New York: Guilford Press; 2013.
8. Prochaska JO, DiClemente CC. The transtheoretical approach: crossing traditional boundaries of therapy. Illinois: Don Jones / Irwin; 1984.
9. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: Applications to the addictive behaviours. *Am Psychol*. 1992;47:1102-14.
10. Gao X, Lo ECM, Ching Ching Kot S, Chi Wai Chan K. Motivational interviewing in improving oral health: A systematic review of randomized controlled trials. *J Periodontol*. 2013;85:426-37.
11. O' Mullane D, Parnell C. Early childhood caries: a complex problem requiring a complex solution. *Comm Dent Health*. 2011;28:254.
12. Naidu R, Davis L. Parent's views on factors influencing the dental health of Trinidadian preschool children. *Comm Dent Health*. 2008;25:44-49.
13. Naidu R, Nunn J, Forde M. Oral healthcare of preschool children in Trinidad: a quantitative study of parents and caregivers. *BMC Oral Health*. 2012;12:27.
14. Fischer-Owens S, Gansky SA, Platt LJ, Wientraub JA, Soobader MJ, Bramlett MD, et al. Influences on children's oral health: a conceptual model. *Paediatrics*. 2007;120:e510-e520.
15. Arrow P, Klobas E. Evaluation of the Early Childhood Oral Health Impact Scale in an Australian preschool population. *Aust Dent J*. 2015;60:375-81.
16. Li S, Veronneau J, Allison PJ. Validation of a French language version of the early childhood oral health impact scale (ECOHIS). *Health Qual Life Outcomes*. 2014;6:9. <http://www.hqlo.com/content/pdf/1477-7525-6-9.pdf>.
17. Naidu R, Nunn J, Irwin JD. The effect of motivational interviewing on oral healthcare knowledge, attitudes and behaviour of parents and caregivers of preschool children: an exploratory cluster randomised controlled study. *BMC oral health*. 2015 Dec;15(1):1-5.