



Virginia Commonwealth University  
VCU Scholars Compass

---

Theses and Dissertations

Graduate School

---

2009

# THE EFFECTS OF MOTIVATIONAL INTERVIEWING IN PREGNANCY ON INFANT ORAL HEALTH KNOWLEDGE AND BEHAVIOR

Patricia Arteaga  
*Virginia Commonwealth University*

Follow this and additional works at: <https://scholarscompass.vcu.edu/etd>

 Part of the [Pediatric Dentistry and Pedodontics Commons](#)

© The Author

---

Downloaded from

<https://scholarscompass.vcu.edu/etd/1707>

This Thesis is brought to you for free and open access by the Graduate School at VCU Scholars Compass. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of VCU Scholars Compass. For more information, please contact [libcompass@vcu.edu](mailto:libcompass@vcu.edu).

School of Dentistry  
Virginia Commonwealth University

This is to certify that the thesis prepared by Patricia M. Arteaga B.S., D.D.S., entitled  
THE EFFECTS OF MOTIVATIONAL INTERVIEWING IN PREGNANCY ON  
INFANT ORAL HEALTH KNOWLEDGE AND BEHAVIOR has been approved by his  
or her committee as satisfactory completion of the thesis requirement for the degree of  
Masters of Science in Dentistry

---

Dr. Tegwyn H. Brickhouse D.D.S., Ph.D., Thesis Director, Virginia Commonwealth University School of Dentistry

---

Dr. Michael D. Webb D.D.S., Graduate Program Director of Pediatric Dentistry, Virginia Commonwealth University School of Dentistry

---

Dr. Al M. Best Ph.D., Associate Professor, Virginia Commonwealth University School of Medicine

---

Dr. John H. Unkel D.D.S., Chairman Department of Pediatric Dentistry, Virginia Commonwealth University School of Dentistry

---

Dr. Laurie C. Carter, D.D.S., Ph.D., Director of Advanced Dental Education, Virginia Commonwealth University School of Dentistry

---

Dr. F. Douglas Boudinot, Dean of the Graduate School

April 16, 2009

© Patricia M. Arteaga 2009

All Rights Reserved

THE EFFECTS OF MOTIVATIONAL INTERVIEWING IN PREGNANCY ON  
INFANT ORAL HEALTH KNOWLEDGE AND BEHAVIOR

A thesis submitted in partial fulfillment of the requirements for the degree of Masters of  
Science in Dentistry at Virginia Commonwealth University.

by

PATRICIA M. ARTEAGA  
B.S., George Mason University, 2002  
D.D.S., Virginia Commonwealth University School of Dentistry, 2007

Director: TEGWYN H. BRICKHOUSE D.D.S., PH.D  
ASSISTANT PROFESSOR, DEPARTMENT OF PEDIATRIC DENTISTRY

Virginia Commonwealth University  
Richmond, Virginia  
April 2009

## Acknowledgement

I would like to thank Drs. Tegwyn H. Brickhouse, Al M. Best, and John H. Unkel for their expertise and assistance in making this research project possible. To the ladies at Centering Pregnancy, who facilitated this study and made every session a delight. To my fellow residents, thank you for all of your support and humor day in and day out, to my parents, who from the beginning have encouraged me and given me their unwavering support, and finally, to my loving fiancé Kris, you are my rock and my best friend. I could not have accomplished any of this without you.

## Table of Contents

	Page
Acknowledgements .....	#ii
List of Tables .....	#iv
Abstract .....	#v
Chapter	
1 Introduction .....	#7
RAPIDD Scale .....	#9
Motivational Interviewing .....	#10
2 Materials and Methods .....	#13
Analysis .....	#15
3 Results .....	#16
4 Discussion .....	#18
5 Conclusion .....	#21
References .....	#23
Appendices .....	#27
A Infant Oral Health MI Toolbox .....	#27
B Infant Oral Health Survey .....	#28

## List of Tables

	Page
Table 1: Demographics. ....	#32
Table 2: RAPIDD Responses. ....	#33
Table 3: Analysis of RAPIDD Responses. ....	#34
Table 4: Infant Oral Health Knowledge. ....	#35
Table 5: Dental Home. ....	#36

## Abstract

### THE EFFECTS OF MOTIVATIONAL INTERVIEWING IN PREGNANCY ON INFANT ORAL HEALTH KNOWLEDGE AND BEHAVIOR

By Patricia M. Arteaga, B.S., D.D.S.

A thesis submitted in partial fulfillment of the requirements for the degree of Masters of Science in Dentistry at Virginia Commonwealth University.

Virginia Commonwealth University, 2009

Major Director: Tegwyn H. Brickhouse, D.D.S., Ph.D  
Assistant Professor, Department of Pediatric Dentistry

**Purpose:** The purpose of this study is to examine infant oral health knowledge and readiness of expectant mothers to incorporate preventive oral health behaviors for their infants.

**Methods:** The study used a prospective cohort design to examine the effect of prenatal education and motivational counseling with expectant mothers about infant oral health care readiness. Participants were all enrolled in a prenatal care program called Centering Pregnancy offered by VCU's Department of Obstetrics and Gynecology. They



all completed a pre-survey questionnaire, followed by a motivational counseling intervention, and then completed a post-survey questionnaire.

**Results:** A sample of 30 pregnant women completed the pre- and post-survey. The participants were predominantly white (60%) who had finished college (67%) with an average age of 28.8 years. Based on the analysis of the readiness (RAPIDD scale) responses, the participants showed an improvement in their value for dental health with a p-value illustrating a significant overall change between the pre and post surveys ( $p < .02$ ). The results for the knowledge portion of the survey demonstrated an increase in their infant oral health education, showing a significant change across time ( $p < .0001$ ). The results to the last portion of the pre and post survey illustrated that the participants learned at what age to establish a dental home for their infant.

**Conclusion:** This study has shown that with the proper educational tools parents are able to accept and improve their knowledge related to infant oral health and the prevention of early childhood caries.

## **Introduction**

Most first time parents in the United States receive limited information regarding accurate infant oral health preventive practices. Many new mothers are not aware of the importance of prevention of dental caries in the primary dentition. This lack of knowledge can not only seriously affect the primary dentition of their children but without proper intervention also hinder their permanent dentition. Caries in primary teeth can adversely affect children's growth, resulting in significant pain, potentially life-threatening infections, and a diminished overall quality of life.<sup>1</sup> Issues such as; the timing of their child's first dental visit, what is considered a healthy diet for teeth, how to and how often to brush their child's teeth, and what to expect when primary teeth start erupting are critical topics for new mothers to comprehend.<sup>2</sup> Demographically, those with a low dental IQ and limited access to dental care are represented by poor or minority families.<sup>3</sup> Due to this fact dental caries are 32 times more likely to occur in infants who are of low socioeconomic status and whose mothers have a lower education level compared to the general population.<sup>1</sup> In a recent study, a group of expecting mothers were given a forty-five minute lecture on child oral healthcare, as well as a pre- and post-

lecture survey. When the two surveys were compared, it was found that the mothers had an improved knowledge of oral health.<sup>2</sup> Reaching out to these mothers and educating them about the importance of good oral health could help decrease the incidence of early childhood caries and subsequently reduce existing trends of permanent dentition being affected by uninformed dental habits.

Studies have shown that given the proper tools, mothers are able to learn and improve their preventive oral health practices, aiding in the healthy development of their children's dentition. A study by Finlayson et al. found a positive association between a parents' knowledge of children's oral hygiene and the oral health status of their children. They stated that "it is unrealistic to expect mothers to conscientiously practice oral health promoting behaviors without understanding that baby teeth are important and require care and cleaning and can develop caries".<sup>4</sup> Several studies have investigated the effect of education on the knowledge and oral health practices (measured by plaque score) of parents and their children between 0-5 years of age. Outcomes were measured at 1 month and 6 months, and it was found that parents performed better at the 1 month post lecture along with a decrease in the plaque score compared to baseline.<sup>5</sup> It was concluded that parents require periodic reinforcement of the educational workshop to continue/maintain the decrease in their child's plaque score. This study demonstrated that with proper education and guidance mothers can be motivated about maintaining good oral health practices for their children. Dental health interventions have concluded that parents who received their multi-stage intervention were more likely to report adoption of three positive oral health behaviors; using a trainer cup from one year of age, using safe drinks

and brushing twice a day with fluoride toothpaste.<sup>7</sup> As a result of the intervention, there was an increase in the attendance of mothers at clinics (dental recall) and health centers for the 8-month check up.<sup>7</sup> Another study focused on children 5-15 years of age where an educational program on gingival health was administered.<sup>9</sup> There was a questionnaire at baseline in addition to the child's whole mouth Loe-Silness Gingival index (GI) and Turesky Modification of Quigley-Hein Plaque Index (PI).<sup>9</sup> Four weeks later the children completed the questionnaire to assess their oral health knowledge and were reexamined using the same indices.<sup>9</sup> They found the participants to have greater knowledge with respect to optimal brushing time and optimal frequency of dental visits, as well as a reduction in both the GI and PI.<sup>9</sup> Providing the information is the critical first step in effectively making a difference in the education process, but what some researchers have also considered is the influence of parental knowledge and readiness to the instructional method used in giving the educational intervention.

Effective oral health education is dependent on the readiness of the individual to accept new knowledge and their motivation to change existing behaviors. Assessments of parental readiness to change is useful in planning how to communicate with the parent about problematic parenting behaviors.<sup>15</sup> The Readiness Assessment of Parents concerning Infant Dental Decay (RAPIDD) Scale was developed to assess a parent's stage of change – precontemplative, contemplative, or action – with regard to his/her child's dental health.<sup>15</sup> This instrument based on the work by Prochaska and DiClemente, measures pro and con parental beliefs about caring for their child's teeth.<sup>16</sup> Two constructs were developed that assess the pros, Openness to Health Information and

Valuing Dental Health, and two constructs, Convenience and Change Difficulty, and Child Permissiveness, assess the cons or barriers to change. In the current study the cons portion was not used because the participants at this point were expectant mothers. This instrument was assessed according to the reliability (internal consistency) and validity (construct validity) of the RAPIDD Scale.<sup>15</sup> The study presented evidence that the Stages of Change Theory has utility in understanding the beliefs and behaviors of parents with children at high risk for early childhood caries.<sup>15</sup> The RAPIDD Scale, designed to assess readiness to change parenting practices impacting children's oral health, showed preliminary reliability and validity and has promise in helping to understand and eventually change deleterious parenting practices.<sup>15</sup>

A second aspect is the instructional method and approach that is taken to deliver the infant oral health education. The traditional "advice-giving" approach to health behaviors has not been shown to be effective. Patients have reservations about "being told what to do," and that direct persuasion puts the patients into a defaulted defensive position. Strategies for providing education and direction to patients regarding oral health are changing from the traditional persuasion approach of health education to individualized interventions such as Anticipatory Guidance and Motivational Interviewing. Motivational interviewing (MI) is defined as a brief counseling approach that focuses on the skills needed to motivate others—provides strategies to move patients from inaction to action. MI has been used with success in a variety of health conditions such as drug addiction, diabetes, diet behaviors, and medication compliance. MI has been used to counsel parents and mothers of infants and children at high risk for dental

caries.<sup>12</sup> The goal of a MI counseling session is to establish rapport with the parents/mothers and then provide and discuss a “menu of options” for infant oral health and caries preventive behavior.<sup>14</sup> MI focuses on techniques such as open-ended questioning, affirmations, and the reinforcement of self-efficacy, reflective listening, and summarizing, all used in a directive manner.<sup>11</sup> Counselors encourage the parents to talk and are supportive listeners without judgment. They help the parent to identify the discrepancies between their current behavior and the goal of dental health for their child.

Evidence for the effectiveness of advice giving (information with persuasion) for lifestyle change is only 5-10 %.<sup>10</sup> Children of mothers who received MI had a 46% lower rate of decayed, missing and filled teeth, “dmft” after 2 years than subjects in the control groups.<sup>11</sup> In another study, children whose mothers had at least two counseling sessions had significant fewer decayed surfaces than children at baseline.<sup>13,16</sup> An additional study provided information (video and pamphlet) to one group of mothers (control) and motivational interviewing (MI) plus the video and pamphlet to the second group.<sup>6</sup> At a two year follow-up the children whose mothers received both the information and MI exhibited significantly less new caries than those of the control group.<sup>6</sup> These techniques have been shown to be effective in decreasing levels of early childhood caries in the children of mothers who received this instruction. The purpose of this study was to examine the infant oral health knowledge and readiness of expectant mothers to incorporate preventive oral health behaviors for their infants.

## **Materials and Methods**

This study used a prospective cohort design to examine the effect of prenatal education and motivational counseling with pregnant women about infant oral health care. The study was approved for human subjects by the Virginia Commonwealth University Institutional Review Board. Patients filled out a survey prior to receiving a motivational counseling intervention (pre) and afterwards (post).

Women who were enrolled in a prenatal care program called Centering Pregnancy (offered by VCU's Department of Obstetrics and Gynecology) were the population sampled for the prospective cohort. In the Centering Pregnancy Program, women were grouped together with 8-12 other women with similar due dates to receive prenatal education and medical care. The Centering Pregnancy Program alters routine prenatal care by bringing women out of exam rooms and into groups for their care. Women have their initial intake into their obstetric care in the usual manner with history and physical examinations occurring within the clinical space. They are then invited to join 8-12 other women with similar due dates in meeting together regularly during their pregnancy. The groups form at the end of the first trimester and continue through the early postpartum period meeting every month (approximately 10 sessions). As women come to

the group they engage in self-care activities of weight and blood pressure, estimating gestation age and recording in their own medical chart. This program of prenatal care is a model of empowerment for both women to take control of their bodies, pregnancies, families, as well as the health care provider to share their care-giving with their clients.<sup>21</sup> The groups of expectant mothers were provided with infant oral health education/counseling during session 9.

The Centering Pregnancy sessions are approximately 2 hours long and a 30-minute portion of session 9 was devoted to infant oral health education through an instructional seminar that utilizes motivational interviewing techniques. At the prior session (session 8) a pre-survey was completed by the women to assess their stage of readiness for change (RAPPID scale) and baseline knowledge of infant oral health. One month later (session 9), an instructional seminar and counseling session on infant oral health will take place. At the end of this session a post- survey was completed by the same women. The instructional infant oral health seminar/counseling session was based on motivational techniques used in preventive infant oral health programs.<sup>14</sup> The session questions varied based on the responses provided by the patients, using our Infant Oral Health MI Toolbox. The following is a sample MI technique (sample questions) that was used in the counseling sessions:

*Instructor: How does it feel to be a first time mom?*

*Patient response:*

*Instructor: Why would anyone want to know about children's oral health?*

*Patient response:*



*Instructor: What do you all want to know?*

*Responses:*

*Instructor: Tell me how you all feel about dental health in general.*

*Responses:*

*Instructor: Suppose you were granted a “dental miracle” what would happen?*

*Responses:*

*Instructor: Ten years into the future, what would you want your child’s teeth to look like?*

*Instructor: Lets’ make a plan of how we would like to proceed.*

This study provided a pre and post measure of the mother’s oral health knowledge and set the stage of readiness for the acceptance of infant oral health education and impact of infant oral health education/counseling on the mother. The pre-survey instrument includes both oral health knowledge measures and the RAPIDD scale. The RAPIDD scale is a measure of parental readiness to change children’s dental behaviors. The instrument is based on four constructs (Openness to Health Information, Valuing Dental Health, Convenience/Difficulty, and Child Permissiveness).<sup>15</sup> The survey instrument has been modified and tailored to expectant mothers. The post-survey instrument contains the same items as the pre-survey. Expectant mothers filled out a survey prior to receiving an educational intervention (pre) and afterwards (post).

### **Data Analysis**

The outcome variable was the pregnant mother’s knowledge of oral health and readiness to change dental behaviors measured pre- and post- educational intervention.

Knowledge scores were calculated by summing 12 knowledge items, while 7-items were used to construct a mean score for each construct of the readiness RAPIDD scale (Openness to Health Information, Valuing Dental Health, Convenience/Difficulty, and Child Permissiveness). Pre versus post comparisons were accomplished using repeated-measures analysis. In the case of continuous outcomes, repeated-measures mixed-models analysis was used and in the case of binary outcomes, repeated-measures logistic regression was used by a GEE (generalized estimating equations) approach. SAS software was used (SAS version 9.2 and JMP version 8.0, SAS Institute Inc, Cary NC).

## Results

The  $n = 30$  individuals who began the study were predominantly white (60%), and had finished college (67%), as seen in Table 1. The average age was 28.8 years (SD = 6.14, range = 20–42).

The first part of the survey contained seven items concerning openness to health information and valuing dental health. The summary description for each item and the subscales are shown in Table 2. For each item, patients were asked to rate their agreement between “strongly agree” (SA) to “strongly disagree” (SD) on a 5-pt scale. On the first item, “I get help on how to take care of my baby from TV, magazines, newspaper, books or the internet,” 23% (7 of 20) “strongly agreed” during the pre-test and 32% (9 of 28) during the post-test. A mean score was calculated by assigning numeric values to these Likert-scale options. A value of 1 was assigned for SA through a 5 for SD. Using this measure, the pre-test mean of the first item was 2.07 and the post-test mean was 2.11.

The LS means for each area, at each time point, are shown in Table 3. Overall the pre-test mean improved from 1.54 to 1.35 (95% CI on the change = 0.04–0.33). The table also indicates that there was no significant change in the openness area ( $p > 0.2$ ), but that

there was a change in the valuing area ( $p < .02$ ). In other words, the respondents were already open to health information before the intervention, but their value of dental health improved significantly after the intervention.

There were also eleven knowledge items. The summary of these responses are shown in Table 4. The pre- versus post- comparison were accomplished using a GEE repeated-measures logistic regression approach with an exchangeable correlation structure. A factor in the model included period (pre vs. post). There was a significant change across time ( $p < 0.0001$ ). The percentage of yes responses improved from 70.2 (95% CI = 65 – 75) to 90.4 (95% CI = 86 – 94), meaning that the participants actually understood the intervention and incorporated their new found knowledge to their answers. The estimated OR is 4.15 (95% CI = 2.55 – 6.74). That is, the odds of giving a correct response in the pre-test are 192 to 81 and the odds in the post-test are 275 to 28.

And finally, subjects were asked “At what age should a child first see a dentist?” The summary shows that nearly half of patients during the pre-test did not know that the correct answer is “at 1 year” however, responses given at post test yielded all participants answering correctly (see Table 5). This clearly shows that the participants were able to identify at what age they are to establish a dental home for their child.

## Discussion

The assessment of parental readiness is a crucial factor in determining how a particular individual will implement new information. In a study that tested the RAPPID scale, Weinstein and Riedy, concluded that it is a reliable and valid tool in assessing readiness to change parenting practices impacting children's oral health.<sup>15</sup> In terms of the RAPPID scale in this population of expectant mothers, the overall pre-test least square mean improved from 1.54 to 1.35, meaning that the participants were highly open to health information and that they valued dental health. Across the intervention, results indicated no significant change in the openness area, but there was change in the valuing area. This indicated that the subjects were already open to the idea of receiving health information, but that their value in dental health improved significantly after the intervention. The use of MI as a tool in this study points to improvement in the "valuing" of infant oral health.

Another study sought out to test MI to prevent early childhood caries in South Asian families over a time span of 2 years. Their results showed a 46% lower "dmfs" rate in children whose mothers received the MI intervention when compared to the control group.<sup>11</sup> Based on their findings and the findings of recent meta-analyses they concluded

that “adaptations of MI are a promising approach to treat problem behaviors.”<sup>11, 19, 20</sup> They also stated the frequency of fluoride varnish visits were higher in the experimental group versus the control group.<sup>11</sup> This behavior demonstrates the positive impact MI can have on individuals who are exposed to it.

Multiple studies have found that an educational intervention makes an impressive impact on the preventative oral health practices of the parent. Knowledge is crucial in changing deleterious habits and instilling the right mentality about dental care. One in particular examined the effect of an educational intervention on both parent’s knowledge and the plaque score of their child.<sup>5</sup> The study demonstrated “a positive effect at one and six months, regarding a reduction of bacterial plaque in children and an increase in knowledge and healthy practices in parents”.<sup>5</sup> The decrease in plaque shown after six months in contrast to the one month interval may be due to the fact that oral health education as a single preventive measure is capable of achieving a clinical temporary effect.<sup>17</sup> Therefore, the authors concluded that a periodical reinforcement of the intervention could maintain the short time effect on plaque reduction for a longer period of time.<sup>18</sup> The results from the knowledge portion of this study mirror past research results. The percentage of yes responses improved from 70.2% to 90.4%. In the last question “At what age should a child first see a dentist” half of the participants were not aware the correct answer was “at 1 year” and by the post-survey they unanimously responded correctly.

This study did have a few limitations related to selection bias of the population of expectant mothers enrolled. The expectant mothers involved were actively seeking

information regarding themselves and their future child just by the fact that they participants in Centering Pregnancy. This may have skewed the results toward our favor, producing significant changes. Another limitation is that our sample size was small, not allowing for a wider spectrum of results. Lastly, not having the capability of following the subject's over a longer period of time limited the ability to establish the long term impacts of the intervention on the infant's utilization of dental services, establishment of a dental home, and dental health status.

Several policy implications come to mind when reviewing these results, for instance a policy implication regarding the establishment of a dental home for infants and expectant mothers. This would provide an excellent foundation for the prevention of early childhood caries. Secondly, the possibility of new legislation with Medicaid/SCHIP, healthcare reform or both that may provide coverage for oral health services for expectant mothers and their infants for certain periods of time, from pregnancy to when the child reaches a particular age. Effective preventive interventions are needed that may be applied across the spectrum of health care providers to address the disparities in oral health that affect high-risk infants.

A future study that may provide a better insight into the retention of the new found knowledge would be a one year follow-up survey. This may show whether or not the mothers have implemented good oral hygiene practices for their child and if they have established a dental home with appropriate utilization of preventive services.

## **Conclusion**

Knowledge and awareness is the key in decreasing the prevalence of early childhood caries in children. The sooner proper educational tools are provided to parents, the greater chance they will implement their new found skills to their children. Whether the parent is ready to receive the knowledge is a challenge to all pediatric health care providers. The RAPPID scale is a valuable instrument that will aid the practitioner in determining whether a parent is likely to apply the information he or she has received. Once it is evident that the parent is willing to accept the educational intervention then the next step would be to provide the information using motivational interviewing techniques. This method of instruction provides the least intimidating and most responsive form of interaction between the practitioner and parent. It allows for free discussion about concerns and leaves the parents at ease about their child's oral health. In conclusion, this study has shown that with the proper educational tools parents are able to accept and improve their knowledge related to infant oral health and the prevention of early childhood caries.



## **Literature Cited**

### Literature Cited

1. American Academy of Pediatric Dentistry: Clinical guideline on infant oral health care. *Pediatric Dentistry*. 2004-2005;67-69
2. Kaste L, Sreenivasan D, Koerber A, Punwani I, Fedvi S. Pediatric oral health knowledge of african american and hispanic of mexican origin expectant mothers. *Pediatric Dentistry* 2007;29:287-292
3. Mouradian W. The face of a child: children's oral health and dental education. *Journal of Dental Education* 2001;65:821-831
4. Finlayson T, Delva J, Sohn W, Siefert K, Ismail A. Reliability and validity of brief measures of oral health-related knowledge, fatalism, and self-efficacy in mothers of african american children. *Pediatric Dentistry* 2005;27:422-427
5. Martignon S, Gonzalez M, Santamaria R, Jacome-Lievano S, Munoz Y. Oral-health workshop targeted at 0-5yr.old deprived children's parents and caregivers: effect on

knowledge and practices. *The Journal of Pediatric Dentistry* 2006;31:104-108

6. Benton T, Harrison R, Weinstein P. Motivating mothers to prevent caries. *JADA* 2006;137:789-793

7. Hamilton F, Davis K, Blinkhorn A. An oral health promotion programme for nursing caries. *International Journal of Pediatric Dentistry* 1999; 9:195-200

8. Davies G, Duxbury J, Boothman N, Davies R, Blinkhorn A. A staged intervention dental health promotion programme to reduce early childhood caries. *Community Dental Health* 2005;22:118-122

9. Biesbrock A, Walters P, Bartizek R. Initial impact of a national dental education program on the oral health and dental knowledge of children. *The Journal of Contemporary Dental Practice* 2003;4:1-7

10. Britt E, Hudson S, Blampied M. Motivational interviewing in health setting. *Patient Educ Couns* 2004;53:47-155

11. Harrison R, Benton T, Everson-Stewart S, Weinstein P. Effect of motivational interviewing on rates of early childhood caries: a randomized trial. *Pediatric Dentistry* 2007;29:16-22

12. Weinstein P. Behavioral problems in the utilization of new technology to control caries: patients and provider readiness and motivation. *BMC Oral Health* 2006;6:Suppl 1
13. Harrison R, Wong T. An oral health program for an urban minority population of preschool children. *Community Dent Oral Epidemiol* 2003;31:392-399
14. Weinstein P. *Motivate your dental patients: a workbook*. 2002. Seattle: University of Washington
15. Weinstein P, Riedy CA. The reliability and validity of the RAPIDD scale: readiness assessment of parents concerning infant dental decay. *ASDC J Dent Child* 2001;68:129-135
16. Prochaska J, DiClemente C. *The transtheoretical approach: crossing traditional boundaries of change*. Homewood: Doresy Press 1984
17. Kay EJ, Locker D. Oral health promotion and caries prevention. *Prim Dent Care* 1999;6(1):35-37
18. Sohn W, Ismail AI, Tellez M. Efficacy of educational interventions targeting primary care providers practice behaviors: an overview of published systematic reviews. *J Public Health Dent* 2004;64(3):164-172

19. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. *J Consult Clin Psychol* 2003;71:843-861

20. Rubak S, Sandbaek A, Lauritzen T, Christensen B. Motivational interviewing: a systematic review and meta-analysis. *Br J Gen Pract* 2005;55:305-312

21. Centering Pregnancy Program, Centering Healthcare Institute Inc. 2008.

[www.centeringpregnancy.org](http://www.centeringpregnancy.org).

## **APPENDIX A**

### Infant Oral Health MI Toolbox

It is okay to add juice or sweet things to a baby's bottle

When weaning a baby from the breast/bottle; it is important to focus on nighttime

Babies should be held when feeding

Putting your baby to bed with a bottle can cause cavities

Baby's teeth should be cleaned as soon as they appear

If your baby wakes at night, give them water

Babies should first see the dentist at one year of age

Adults with cavities can pass tooth decay germs to children

Cavities in baby teeth need to be fixed

Fluoride can be used to coat and protect the teeth of infants and children

**APPENDIX B**

*Infant Oral Health Survey*

ID#

1. I get guidance on how to take care of my baby from TV, magazines, newspaper, books or the internet

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

2. It will be easy to change any habits I may have to help decrease my child's chance of getting cavities.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

3. I feel comfortable asking questions at the health center regarding the baby.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

4. Keeping my baby's teeth healthy is important to me.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

5. My baby will benefit from my cleaning his/her teeth.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

6. I like the idea of a health person putting medicine on my baby's teeth to protect them from getting cavities.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

8. Dental visits are as important as regular medical check-ups.

Strongly Agree

Strongly Disagree

Agree

Disagree

Neutral

9. Putting a child to bed with a bottle containing milk can cause cavities.

Yes

No

Don't know

10. Putting a child to bed with a bottle containing juice can cause cavities.

Yes

No

Don't know

11. Fluoride helps prevent tooth decay.

Yes

No

Don't know

12. Fluoride can be used to coat and protect the teeth of infants and children.



Yes                       No                       Don't know

13. Bacteria and germs on the teeth help to produce cavities.

Yes                       No                       Don't know

14. Adults who have cavities can pass tooth decay germs to their children.

Yes                       No                       Don't know

15. A child should have their teeth brushed by their parents, until they have shown capability.

Yes                       No                       Don't know

16. A child should see a dentist at 1 years old.

Yes                       No                       Don't know

17. Snacking in between meals is healthy, keeps baby teeth nourished.

Yes                       No                       Don't know

18. Do you have or have you had cavities in you teeth in the last 5 years?

Yes                       No

19. What is your race?

20. How many years of education do you have?

21. What is your age?

ID#

Baby's approximate due date (month, year):

Name

---

Mailing Address

---

---

Phone #

---

Permanent contact if mailed returned

---

Address

---

---

Phone #

---

**Table 1: Demographics**

Race	n	%
Asian	1	3
Black/African American	10	33
Hispanic	1	3
White	18	60
Education		
High School/GED	2	7
Some College/Technical School	8	27
Finished College	20	67

**Table 2: RAPIDD Responses**

Question	Period	RAPIDD responses (n)					Mean	SD	SA%
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree			
<i>Openness to Health Information</i>									
1. I get help on how to take care of my baby from TV, magazines, newspaper, books or the internet.									
	Pre	7	16	5	2	0	2.07	0.83	23
	Post	9	12	3	3	1	2.11	1.10	32
2. It will be easy to change any habits I may have to help decrease my child's chance of getting cavities.									
	Pre	10	12	7	1	0	1.97	0.85	33
	Post	15	9	4	0	0	1.61	0.74	54
3. I feel comfortable asking questions at my health care provider regarding the baby.									
	Pre	26	4	0	0	0	1.13	0.35	87
	Post	26	2	0	0	0	1.07	0.26	93
4. Keeping my baby's teeth healthy is important to me.									
	Pre	29	1	0	0	0	1.03	0.18	97
	Post	28	0	0	0	0	1.00	0.00	100
Average of questions 1-4									
	Pre						1.55	0.34	60
	Post						1.45	0.37	70
<i>Valuing Dental Health</i>									
5. My baby will benefit from my cleaning his/her teeth.									
	Pre	25	4	1	0	0	1.20	0.48	83
	Post	27	1	0	0	0	1.04	0.19	96
6. I like the idea of a health person putting medicine on my baby's teeth to protect them from getting cavities.									
	Pre	10	10	7	3	0	2.10	0.99	33
	Post	15	9	3	1	0	1.64	0.83	54
7. Dental visits are as important as regular medical check-ups.									
	Pre	23	5	0	1	0	1.28	0.65	79
	Post	25	3	0	0	0	1.11	0.31	89
Average of question 5-7									
	Pre						1.52	0.53	65
	Post						1.26	0.31	80

**Table 3: Analysis of RAPIDD responses**

Area	Time	RAPIDD responses (n)			p-value	
		LS Mean	SE	95% CI		
Openness to Health Information						
	Pre	1.55	0.073	1.41	1.69	
	Post	1.45	0.076	1.30	1.60	
	difference	0.10	0.099	-0.09	0.30	0.2978
Valuing Dental Health						
	Pre	1.53	0.084	1.36	1.69	
	Post	1.26	0.086	1.09	1.43	
	difference	0.27	0.115	0.04	0.49	0.0208
RAPIDD						
	Pre	1.54	0.058	1.42	1.66	
	Post	1.35	0.060	1.23	1.47	
	difference	0.18	0.076	0.04	0.33	0.0154

**Table 4: Infant Oral Health Knowledge**

Question	Period	Response		
		No	Yes	%Yes
<b>8. Putting a child to bed with a bottle containing milk can cause cavities.</b>				
	8 Pre	1	21	95
	Post	0	27	100
<b>9. Putting a child to bed with a bottle containing juice can cause cavities.</b>				
	9 Pre	0	29	100
	Post	0	28	100
<b>10. Fluoride helps prevent tooth decay.</b>				
	10 Pre	0	25	100
	Post	0	28	100
<b>11. Fluoride can be used to coat and protect the teeth of infants and children.</b>				
	11 Pre	0	20	100
	Post	3	25	89
<b>12. Bacteria and germs on the teeth help to produce cavities.</b>				
	12 Pre	1	29	97
	Post	0	28	100
<b>13. Adults who have cavities can pass tooth decay germs to their children.</b>				
	13 Pre	12	8	40
	Post	0	28	100
<b>14. Baby's should have their teeth cleaned/brushed regularly by their parents.</b>				
	14 Pre	0	26	100
	Post	0	28	100
<b>15. Do cavities in baby teeth need to be filled?</b>				
	15 Pre	5	10	67
	Post	3	23	88
<b>16. Has a doctor or nurse ever told you when your child should be off the bottle?</b>				
	16 Pre	21	7	25
	Post	12	14	54
<b>17. Has a doctor or nurse ever told you how to clean your child's teeth?</b>				
	17 Pre	20	9	31
	Post	7	21	75
<b>18. Has a doctor or nurse ever told you when your child should begin seeing the dentist?</b>				
	18 Pre	21	8	28
	Post	3	25	89
<b>All knowledge items</b>				
8-18	Pre			90
	Post			97

**Table 5: Dental Home**

	Don't know	at 1 year	at 3 years	Older than 3 years
Pre	12	14	4	0
Post	0	28	0	0

---

## VITA

Although I was born on 07/05/1980 I feel as if my life truly did not begin until I arrived in the United States at the young age of 5. Coming from the impoverished city of La Paz, Bolivia I feel very fortunate to have been given the privilege to pursue all of the tremendous opportunities this country offers me as a citizen. I graduated from George Mason University with honors and obtained a B.S. in Biology. My dental career began at the VCU School of Dentistry, where I graduated Magna Cum Laude. My aspirations of working with children coupled with my passion for dentistry seemed a natural path to pursuing a specialization within the field of Pediatric Dentistry. My residency experience at the VCU School of Dentistry was an amazing and unforgettable chapter. As I was fortunate enough to be appointed the position of Chief Resident, I honed not only my clinical techniques but management skills as well. As I venture out to new horizons, this overall experience is something that I will not just take upon my journey, but is something I am truly confident that I will draw upon the foundation and lessons it has engrained in me, both professionally and personally.