

Oral Health Education and Dental Patients'
Perceptions, Attitudes, and Behavior:
A Person-Environmental Fit Analysis

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Abstract

The objective of this study is to explore whether the type of oral health education provided will affect patients' oral health-related perceptions, attitudes, and behavior. It is predicted that patients who receive oral esthetic related education will show more positive esthetic related behavior, attitudes and oral health-related quality of life (ohrqol), while patients who receive the oral hygiene and health-related education will show more behavior related to oral health promotions, better attitudes and ohrqol related to oral hygiene (Hypothesis 1). Survey data were collected from 198 patients during their regularly scheduled dental appointments and one week later in a telephone interview. The results showed that patients who received the esthetic related education showed more positive esthetic related behavior, such as the use of whitening strips. Patients who received the oral health promotion-related education did not show an improvement in health-related behaviors, attitudes, or ohrqol. In conclusion, targeting oral health education to one specific type of behavior could ultimately result in a more positive outcome.

Keywords: health education, oral health, prevention

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Dental caries and periodontal disease are major health concerns. Dental caries is the most common chronic disease of children between the ages of 6 and 11 years and adolescents aged 12 to 19 years in the US. Adults in the US are also affected, with 90% of adults over the age of 20 years having some degree of tooth decay (Dye et al., 2007). In 2001, Truman et al. showed that the percentage of adults with ≥ 1 decayed, missing, or filled permanent teeth increased with age, from 26% among children between 5 and 11 years of age to 67% among adolescents between 12 and 17 years and 94% of adults aged 18 years or older with ≥ 1 natural teeth (Truman et al., 2001). In addition, one of the biggest threats to dental health is periodontal disease. Periodontal disease is prevalent in 80% of US citizens. If these diseases are not treated in time, they can lead to more severe problems. Untreated dental caries can result in pain and infections, tooth loss, and ultimately in edentulism (Beltrán-Aguilar et al., 2005). Lack of treatment of periodontitis can result in bone and tooth loss. In addition, research also showed that patients are both physically and psychologically affected by poor oral health. It influences their general health such as their cardiovascular health (American Heart Association, 2009), diabetes (American Diabetes Association, 2007), and the likelihood of preterm deliveries (Katz, Orchard, Ortega, Lamont, & Bimstein, 2006). Oral health also has a great impact on patients' quality of life (Inglehart & Bagramian, 2002).

Both caries and periodontal disease are preventable diseases (Chauncey, Glass, & Alman, 1989). If patients would regularly brush their teeth, floss, reduce the intake of acidic and / or sugary beverages and / or food, abstain from using tobacco products, and visit the dentist regularly, their oral health could be excellent. However, patients do not engage in these

preventive and healthy behaviors due to a variety of reasons such as lack of knowledge, financial issues, and anxiety associated with dental visits (Cohen, Fiske, & Newton, 2000).

As mentioned, lack of knowledge is a contributing factor as to why patients do not alter their lifestyle to achieve better oral health. It is important for patients to be well informed on how to practice good oral hygiene. Research has shown that patients are not necessarily aware of factors that contribute to oral diseases. For example, a study was conducted with smokers and non-smokers to examine differences in patient awareness of the effects of smoking on oral health. A total of 1,012 dental patients completed a self-administered structured questionnaire concerning questions about the effects of smoking. Results showed that dental patients, who smoke, versus non-smokers, were less aware of the existing relationship between oral health and smoking, and of the fact that smoking was related to oral cancer, periodontal health, and tooth staining (Shammari, Moussa, Al-Ansari, Al-Duwairy, & Honkala, 2006).

Given these findings, it seems crucial that healthcare providers accept responsibility for educating their patients (Putnam, O'Shea, & Cohen, 1967). The National Opinion Research Center (NORC) conducted a survey of 1,862 adults. The survey included general questions about how often patients asked their dentists any questions, and how often dentists provided patients with information without being asked. The results showed that two thirds of the respondents had never asked for advice on how to take care of their teeth and gums, and nearly half of the respondents only received such advice after asking for it. Based on these results, it was concluded that dentists should increase their efforts to effectively communicate with their patients about the prevalence of oral diseases, and preventative methods.

Research has shown that patients who practice good oral health-related behavior are motivated by their healthcare providers. Research showed that the amount of education that

practitioners provided for their patients affected the degree to which patients practiced good oral hygiene (Clark et al., 1998). A longitudinal study, with the objective to explore a priming effect of physician advice on patient responses to behavioral change interventions, was conducted in southeastern Missouri (Kreuter, Chheda, & Bull, 2000). The baseline questionnaire assessed the amount of cigarette smoking, dietary fat consumption, and patients' receipt of physician advice concerning specific lifestyle behaviors. Following, three different types of health education materials were mailed to patients' homes, in an attempt to reduce behavioral risk factors for cardiovascular disease. Each educational material targeted a specific behavior such as smoking, exercise, or dietary fat consumption. Patients could receive 0, 1, 2, or all 3 forms of educational material depending on their responses in the baseline questionnaire. Approximately three months later, follow-up questionnaires were mailed to the patients' homes. This survey contained the same questions as the baseline questionnaire, but also included additional questions such as if the patients remembered receiving the health information, how much of it they had read, and how informative it was. Results indicated that patients, who received physician advice and educational material to help them quit smoking, consume less fat, or exercise more, were more likely to positively alter their behavior. This study showed that physician advice is a possible mechanism for motivating patients to change their behavior and become more health-conscious (Kreuter, Chheda, & Bull, 2000).

While educating patients is an important factor in motivating behavioral change, the presentation of information is of importance as well (Clark, 1976). Research concerning the importance of education explored the effects of physicians' level of enthusiasm when providing information to their patients. A study about dental home-care programs showed that the degree of success of educating patients is affected by dentists' attitudes. Patients are able to perceive if

a dentist is feeling impatient or frustrated, and this negative perception results in reluctance to follow instruction and a lower degree of cooperation. Thus, dentists' ability to motivate a patient relies on acknowledging that all patients are capable of achieving excellent oral health, regardless of their present condition. As patients recognize their potential, they achieve more self-respect and are more likely to show an interest in their well-being (Clark, 1976).

Based on previous studies, it is evident that patient motivation and dental education affect patients' oral health-related behavior and attitudes. Furthermore, patient motivation is not limited to avoiding dental caries or other dental-related diseases. Some patients practice good oral hygiene to simply improve the appearance of their teeth (Christensen, 2002). Tooth discoloration can result from poor oral hygiene, smoking, and drinking beverages that stain teeth, such as red wine, coffee, or tea. Many patients seem to be concerned about the way their teeth look because of its effect on attractiveness (Grososky et al., 2003). In a study, 297 people were asked to view a total of eight photographs; four photos showed the smiles of male adults and four of female adults. Respondents were then asked to rank the photographs in the order from the most to the least appealing appearance. Results showed that the teeth of the female smile, which was rated as most attractive, were twice as lighter in shade than the teeth of the least attractive smile; the same results were found for the males (Dunn, Murchison, & Broome, 1991).

Considerations concerning which type of information should be used when educating patients about oral health promotion can benefit from social psychological considerations concerning behavior change. For example, Ajzen and Fishbein (1977, 1980) stated in their behavioral intentions model that behavior or outcomes of interventions can be best predicted by attitudes that are specifically related to these behaviors. For example, a person's attitude towards tooth brushing would be better related to actual tooth brushing behavior than a general attitude

concerning the value of having good oral health. For this study, concerning the effects of educational interventions on patients' oral health-related behavior, this theory would therefore predict that content specific material should be used to achieve certain specific behavior changes.

A second social psychological theory that can be applied to the objective of this study is the Theory of Cognitive Dissonance by Festinger (1957). This theory states that dissonance arises when a person receives information that is inconsistent with the person's beliefs or when the person is induced to behave in ways that are inconsistent with the person's beliefs, values, ideas, or desires. This tension motivates the person to engage in behaviors that will reduce the dissonance. For example, this type of conflict results when an individual wants to smoke, yet he/she knows that smoking is unhealthy. This person may try to change their feelings about the chances of suffering the consequences related to smoking, or he/she might choose to believe that smoking is actually worth the short term benefits (Festinger & Carlsmith, 1959).

Cognitive dissonance can have a powerful impact on motivation and learning as well. For example, researchers have used the Effort Justification Paradigm to increase students' enthusiasm for educational activities by not offering external rewards for students' efforts (Lepper & Greene, 1975). Research showed that young school children, who were promised a reward for completing a task, were less interested in the task later, compared to children who were not offered a reward initially. The researchers concluded that students stop working in the absence of the reward, if they attributed their work to an external reward, while those who were forced to attribute their work to intrinsic motivation, learned to find the task enjoyable. The Specificity Principle and the Theory of Cognitive Dissonance both address the ways in which beliefs and attitudes relate to their future behavior (Brehm & Cohen, 1962). Based on these considerations, this study predicts that when educational interventions address a specific type of

behavior, it is more likely that this specific type of behavior will be changed and it is less likely that related behaviors will be changed.

The effectiveness of specific information on specific behavior change has been shown by Maxwell et al. (2010). These authors demonstrated that parents, who received visual information with written or oral explanations, showed an increase in oral health-related awareness, as compared to parents who did not receive any type of education. Increased oral health-related awareness was correlated with improved oral health-related behaviors. In addition, Roter et al. (1998) showed a correlation between the types of education that physicians' administered to their patients and subsequent behavior. This study involved the use of visual aids and oral information to educate patients about common illnesses such as heart disease and high cholesterol. A few weeks later, patients were asked how their behavior had changed since their last doctor's visit. Results showed that patient behavior improved, specific to the type of education they received, as compared to patients who did not receive any type of education. For example, if patients received information regarding how to decrease chances of suffering from heart disease, they improved behaviors such as exercising more frequently, and maintaining a heart-healthy diet. Conversely, patients, who received information regarding how to manage their cholesterol levels, changed certain lifestyle habits specific to areas that contribute to cholesterol problems, such as consumption of foods that are high in saturated fats. This study showed that patients improved behavior that was specific to the type of educational information received. Thus, these results can be used to predict the effects of different types of education on patient behavior, specific to dentistry.

In summary, the objective of this study was to explore whether the type of education (esthetic vs. oral health-related) received will affect patients' oral health-related attitudes and

behavior (**Aim 1**). **Hypothesis 1** predicts that patients who receive esthetic related education will show more positive esthetic related perceptions, attitudes and behavior than patients who receive the hygiene and oral health-related education. Conversely, it is predicted that patients who receive the hygiene and oral health-related education will show more positive health-related perceptions, attitudes and behavior than patients who receive the esthetic information.

Method

To test these hypotheses, a quasi experimental study was conducted in the dental clinics at the University of Michigan – School of Dentistry. This study was approved by the Institutional Review Board (IRB) for the Behavioral and Health Sciences at the University of Michigan in Ann Arbor, Michigan, (Review number HUM00049410).

Respondents

Data were collected from 198 regularly scheduled adult dental patients (18 years and older) at the University of Michigan School of Dentistry. Table 1 shows that the participants (42.9% males/ 57.1% females) were between 18 and 87 years old (average age: 51.15 years; *SD* = 16.72) and were mostly of European American descent (74.2%; African American: 10.1%; Asian American: 2.5%; American Indian: 2.0%; Arabic: 1.5%; Mexican: 2.0%).

Procedure

The data were collected between September 2011 and November 2011. When the patients arrived for their regularly scheduled appointments at the University of Michigan – School of Dentistry, they were informed about the research and were invited to participate in the study (see Oral Recruitment Script Appendix A). The patients were informed that they would receive a voucher for free parking if they participated in this study by responding to a survey at the beginning of their appointment and one week later during a follow-up phone call. If the

patients agreed to participate, they signed the consent form (see Appendix B), and responded to the baseline survey (see Appendix C). At the end of their appointment, participating patients received either an esthetic focused or health focused educational intervention related to practicing good oral hygiene. Each type of educational material included text and graphics in a 3-column format, similar to a pamphlet. Afterward, they received a free parking voucher as a token of appreciation for their participation. One week after their appointment, patients received a follow-up phone call and they responded to questions concerning their oral health-related perceptions, attitudes and behavior. In order to make these follow-up phone calls, some patients had to be called on numerous occasions in order to reach them, from different telephone numbers, and multiple voice messages were left. Overall, however, the response rate for the follow-up survey was 95.5%.

Materials

Oral scripts were used to inform and recruit the patients (see Appendix A). The patient consent form (see Appendix B) was written according to the guidelines of the IRB at the University of Michigan. The Patient Baseline Survey (see Appendix C) assessed how interested the patients were in having esthetic/white teeth and healthy teeth. The questionnaire also included questions about the patient's motivation concerning the importance of oral health, of having white teeth, and of having healthy teeth. After the patients completed the baseline survey, they were randomly given either an esthetic focused or health focused educational intervention which lasted about 10 minutes. Patients were provided with oral and written information. Each type of educational material included text and graphics in a 3-column format, similar to a pamphlet (see Figures 1 and 2).

Following, patients received a follow-up phone call one week after their dental appointment. The Patient Follow-up Survey (see Appendix D) included questions about the effectiveness of the educational intervention by asking patients about their oral health-related perceptions, attitudes and behavior.

Statistical Analyses

The data were analyzed with SPSS (Version 19) (SPSS, 2010). Descriptive statistics (percentages of responses and means / standard deviations / ranges) were used to describe the responses overall as well as the responses of patients who had experienced a consistent situation vs. an inconsistent situation during the visit. A consistent situation was given when the patient's motivation was to have healthier teeth and actually received the oral health-related educational intervention and when the patient's motivation was to have whiter teeth and actually received the esthetic-related educational intervention. An inconsistent condition was given when the patient's motivation did not match the education that they received. Independent sample t-tests were conducted to compare the average responses of patients in the consistent vs. inconsistent conditions. Chi square tests were used to analyze whether the percentages of patients with different characteristics in the consistent vs. inconsistent conditions differed. A significance level of $p \leq .05$ was used.

Results

Before discussing whether the responses of the patients differed between the baseline and follow-up surveys, according to the type of education they had received, it is worthwhile to explore whether background characteristics of the respondents differed in the esthetic vs. health conditions. Concerning the patient characteristics, Table 1 shows that the percentages of males vs. females in the esthetic vs. health conditions did not differ significantly, $\chi^2 (1, N=198) = .52, p$

= .28. In both conditions, slightly more females than males participated in the study. In addition, this table shows that the patients in these two conditions did not differ in their average ages (Esthetic: 51.85 years vs. Health: 50.45 years), $t(19) = 5.86$, $p = .56$ and that they were on average about 51.15 years old. They ranged in age from young adults to elderly patients (18 to 87 years old). The majority of the respondents in both groups were from European American background (“Esthetic” Information = 77.7%, “Health” Information = 83.1%).

It is also important to analyze whether the responses of the patients in the two educational conditions differed at the baseline appointment. Table 2 shows that there was no difference in the patients’ perceived oral health. However, the patients in the “Health Information” condition rated the importance of their dental health as higher than the patients in the “Esthetic Information” condition (on a 5 point scale with 1 = not at all important to 5 = very important: 4.79 vs. 4.57), $t(164.68) = -2.56$, $p = .01$. This difference was the only significant difference found at baseline. The two groups did not differ in their oral health-related behavior, attitudes, and oral health-related quality of life at baseline.

The two groups did not differ in the characteristics of the follow-up phone calls. However, while the respondents in the two groups did not differ in how likely they were to report any behavior change at the follow-up phone call, the subjects in the “Health Information” condition perceived the educational intervention as more helpful than the subjects in the “Esthetic Information” condition (on a 5 point scale with 1 = not at all important to 5 = very important: 4.29 vs. 3.85), $t(175.57) = -3.02$, $p = .003$ (see Table 3). In addition, significantly more subjects in the “Esthetic Information” condition reported to have started using whitening strips since their last dental visit, than subjects in the “Health Information” condition (10 out of

95 vs. 2 out of 93), $\chi^2 (1, N=198) = 5.52, p = .018$. However, no other significant differences between the two groups were found during the follow-up phone call.

Tables 4 and 5 provide information about patient responses at baseline vs. in the follow-up survey. Table 4 shows that the subjects in the “Esthetic Information” condition were more likely to use whitening strips at the follow-up visit, while the subjects in the “Health Information” condition did not change the likelihood of using these strips (esthetic group: 21.2% vs. 32.7%; $p = .018$; health group: 13.1% vs. 15.3%; $p = .093$).

Table 5a shows a statistically significant difference in the frequency of flossing between the patients’ responses in the baseline vs. follow-up survey (d.f. = 1; $p = .022$). Regardless of the type of education received, patients showed an increase in flossing activity, following their appointment (on a 5 point scale with 1 = never, 2 = rarely, 3 = nearly every day, 4 = every day and 5 = more than once a day: health at baseline = 3.15, health at follow-up = 3.25; esthetic at baseline = 3.07, esthetic at follow-up = 3.13).

It is also interesting to note that when patients were asked to rate how concerned they were with the health of their teeth and gums (on a 5 point scale from 1 = strongly disagree to 5 = strongly agree), there was a significant difference between the baseline and follow-up responses (d.f. = 1; $p = .030$), but not in the direction that was predicted. The patients who received the “Health” education dropped from a mean of 2.65 to 2.56, while patients who received the “Esthetic” education dropped from an average of 2.44 to 2.35 (see Table 5c).

Discussion

Before discussing the findings pertaining to the objective of this study, it is important to note that the respondent characteristics (gender, age and ethnic backgrounds) did not differ significantly for the respondents in the “Esthetic Information” vs. the “Health Information”

conditions. This finding is important because differences in those characteristics could potentially have had an effect on the outcome variables of interest in this study, namely on the patients' perceptions of their dental health, their attitudes about practicing better oral health methods, and their oral health-related behavior. The fact that the respondents in the two conditions did not differ in these characteristics offers an optimal starting point for exploring the objectives of this study.

In addition to analyzing whether the subjects in the two groups differed in their background characteristics, it is also important to discuss how the patients' oral health-related responses differed at the baseline assessment. While overall, no significant differences were found, one finding needs to be discussed. At the beginning of the study, the average importance rating of the patients in the "Health Information" condition was significantly higher than the average ratings of the subjects in the "Esthetics Information" condition, with both groups rating their overall health as rather important. This finding might explain why the overall frequency in flossing increased in both groups. Patients in both groups, initially, reported that having healthy teeth was rather important.

The main objective was to explore whether there would be a fit between the type of education offered and the behavior change in response. It was predicted that subjects who received an "Esthetic Information" intervention would show more esthetic related behavior than subjects who received "Health Information." This hypothesis was supported by the fact that more subjects in the "Esthetic Information" condition used whitening strips after their educational intervention had taken place, than subjects in the "Health Information" condition. However, subjects in the "Health Information" condition did not increase their health-related behavior, as a function of having received this type of information, compared to the other

subjects. This finding could be due to the fact that oral health-related attitudes and behavior had been shaped by experiences and education over the course of the subjects' lives and could thus not be as easily altered. This interpretation could also be supported by the finding that the "Health Information" was evaluated as more helpful than the "Esthetics Information" – which also might be connected to the fact that these patients had received frequent reminders of the value of having good oral health before and thus could relate to health information more easily.

As mentioned earlier, an interesting result was gathered, but in the opposite direction from what was expected. When patients were asked to rate how concerned they were about the health of their teeth and gums, there was a significant difference between the baseline and follow-up survey, but not in the direction that was predicted. It was predicted that patients would be more concerned about the health of their teeth and gums after learning more about oral health-related diseases during the educational intervention. However, patients reported a decrease in concern from the baseline to the follow-up survey, independent of the education received (health at baseline = 2.65; health at follow-up = 2.56; esthetic at baseline = 2.44; esthetic at follow-up = 2.35; d.f. = 1; $p = .030$). This finding could be due to the fact that the dental treatment the patients had received at their dental visit had improved their oral health – which in turn made their responses to this question more positive. If no dental treatment had been given, the opposite should have resulted, as shown in a study by Heszen-Klemens and Lapińska (1984).

This study was concerned with periodontitis-related knowledge and its effect on oral health-related behavior. It showed that patients, who had more knowledge about dental related diseases, practiced better oral health-related behavior vs. those people who did not have a lot of knowledge about diseases. In this study, 1001 interviews were conducted with participants to assess their knowledge about periodontal disease. They were then asked to complete a survey

regarding their current oral health behavior. Results showed that the group of participants that showed better oral health behavior had more knowledge about periodontitis (Deinzer, Micheelis, Granrath, & Hoffmann, 2009).

In summary, these findings support earlier research that showed that educational interventions are effective methods for promoting oral self-care behavior (Schüz, Wiedemann, Mallach, & Scholz, 2010). In considerations of these findings, it seems justified to point out that interventions concerning already well-established areas of interest such as, for example, valuing good oral health might result in improved behavior. However, areas of interest that are newly introduced to patients, such as teeth whitening techniques, will be likely to result in more changed behavior. This finding is of relevance to dental care providers, who work in a rapidly changing field.

New techniques related to cosmetic dentistry focus on improving the appearance of a person's teeth, mouth and smile. For example, restorative procedures, such as dental fillings with tooth structure matching restorative materials, are considered under the category of cosmetic dentistry. Patients are now able to select the porcelain or composite material that best matches the color of their teeth, instead of the traditional method when dental fillings were composed primarily of gold, amalgam and other materials that were quite visible. This new method allows patients to maintain the natural appearance of their teeth and smile (Spear & Kokich, 2007). In addition, technological advancements, such as the use of lasers, have allowed for less invasive treatments of tooth decay, gum disease, biopsy or lesion removal, and tooth whitening (Dederich & Buschick, 2004). The findings of this study may alert dental care providers to the importance of educating their patients, about these less discussed new

approaches to oral health care, because patients might be more likely to act on recommendations related to these innovations once they are educated about them.

In a future study, more accurate results could possibly be obtained by controlling for a few variables. For example, in this study, patients' income status or education was not taken into consideration. These factors could have affected patient responses in the baseline and follow-up survey. Individuals, who are financially more secure, are more likely to seek in-office whitening treatments (Christensen, 2005). In addition, individuals who have attained higher education tend to be more concerned about their oral health and are more likely to seek dental care on a regular basis (Jones, Lee, & Rozier, 2007).

This study has several limitations. First, this study was performed in a dental school setting. Patients usually seek care in a dental school because of financial issues. One might argue whether the results would have been different if the study was performed in "real" dental offices with patients of various economic statuses. Second, there could have been a more effective method in collecting data for the follow-up survey. Even after numerous attempts, a few patients still did not respond to the follow-up phone calls. Perhaps, other means of communication, such as e-mail, would have been more effective. A third limitation may be that patients may not have been fully attentive during the educational intervention, so it may not have been a learning experience for them. Lastly, given that an undergraduate student, instead of the patients' dentists, provided the health education, a lack of status and prestige may have been a factor as well. Perhaps, if a dental student or a dentist had provided the health education, patients would have responded more strongly. These limitations could potentially have affected the results of this study.

Conclusions

Overall, the patients evaluated the information received as helpful, with health-related information being seen as more helpful than esthetic related information.

All patients showed an improvement in oral health-related behavior, independent of the type of education received. From the baseline survey to the follow-up survey, patients reported an increase in flossing activity.

When considering the different types of education, patients who received the “Esthetic related” education showed an increase in the use of whitening strips from the baseline to the follow-up survey, compared to patients who had received the “Health-related” education.

The findings of this study are significant for dental practitioners who are interested in studying the effects of education on patients’ oral health-related behavior, attitudes, and ohrqol. Patients who are well informed about oral-health related behavior will promote their oral health by practicing better oral hygiene.

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Author Note

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Table 1

Overview of Respondent Characteristics

Patient characteristics	Total Sample	Esthetic Information	Health Information	<i>p</i>
	<i>N=198</i>	<i>n=99</i>	<i>n=99</i>	
Gender				
Male	42.9%	40.4%	45.5%	.283
Female	57.1%	59.6%	54.5%	
Age in years:				
Mean / SD	51.15 / 16.72	51.85 / 17.48	50.45 / 15.99	.558
Range:	18-87			
Ethnicity/race:				
European American	74.2%	77.7%	83.1%	.089
African American	10.1%	9.6%	12.4%	
Asian American	2.5%	4.3%	1.1%	
American Indian	2.0%	2.1%	2.2%	
Arabic	1.5%	3.2%	0.0%	
Mexican	2.0%	3.3%	1.1%	

Table 2

Patients' Self-perceived Oral Health Responses at the Beginning of the Appointment

Baseline survey – Self-perceived oral health	Total Sample	Esthetic information	Health information	<i>p</i>
How would you describe the health of your teeth and gums?				
Poor	23 (11.6%)	15 (15.2%)	8 (8.1%)	.348
Fair	38 (19.2%)	16 (16.2%)	22 (22.2%)	
Good	65 (32.8%)	37 (37.4%)	28 (28.3%)	
Very good	55 (27.8%)	21 (21.2%)	34 (34.3%)	
Excellent	17 (8.6%)	10 (10.1%)	7 (7.1%)	
	Mean = 3.03 SD=1.133	Mean = 2.95 SD=1.181	Mean = 3.10 SD=1.083	
How important is your dental health to you?*	Mean = 4.68 SD=.618	Mean = 4.57 SD=.731	Mean = 4.79 SD=.458	.011

Note. * Answers were given on a 5 point scale from 1 = not at all to 5 = very important.

Table 3

Patients' Responses in the Follow-up Survey Concerning Evaluation of the Provided Health Education

Evaluation of the provided health education	Total Sample	Esthetic information	Health information	<i>p</i>
Did your behavior change after the educational intervention?				
Yes	34 (17.2%)	19 (20.0%)	15 (16.1%)	.309
No	154 (77.8%)	76 (80.0%)	78 (83.9%)	
How helpful was the education?***	Mean = 4.07 SD=1.019	Mean = 3.85 SD=1.120	Mean = 4.29 SD=.854	.003

Note. ***Answers were given on a 5 point scale from 1 = "not at all" to 5 = "very helpful."

Table 4

Patients' Responses at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Questions	Type of Education	Baseline	Follow-up	p
Do you use whitening strips? % Yes	Health	13.1%	15.3%	.093
	Esthetic	21.2%	31.7%	.018
Which one of the following two is more important to you? Esthetic (whiter) teeth Healthy teeth	Health	Esthetic (whiter) teeth: 6 (6.1%)	Esthetic (whiter) teeth: 6 (6.5%)	.384
		Healthy teeth: 92 (93.9%)	Healthy teeth: 87 (93.5%)	
	Esthetic	Esthetic (whiter) teeth: 8 (8.2%)	Esthetic (whiter) teeth: 7 (7.4%)	.516
		Healthy teeth: 89 (91.8%)	Healthy teeth: 88 (92.6%)	

Table 5

Patients' Average Responses at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Table 5a

Patients' Average Responses Concerning Oral Health-related Behavior at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Oral health-related behavior	Type of education	Baseline	Follow-up	<i>p</i> (time) <i>p</i> (education) <i>p</i> (txe)
How often do you brush your teeth?***	Health	4.50	4.50	<i>p</i> (t)= 1.00
	Esthetic	4.39	4.39	<i>p</i> (e)= .335 <i>p</i> (txe)= 1.00
How often do you brush your teeth with <u>WHITENING</u> tooth paste?***	Health	3.02	3.00	<i>p</i> (t)=.843
	Esthetic	3.03	3.04	<i>p</i> (e)= .894 <i>p</i> (txe)= .565
How often do you floss your teeth?***	Health	3.13	3.25	<i>p</i> (t)= .022
	Esthetic	3.01	3.14	<i>p</i> (e)= .520 <i>p</i> (txe)= .645
How often do you eat/drink sugary food/drinks?***	Health	3.08	3.12	<i>p</i> (t)= .834
	Esthetic	3.20	3.18	<i>p</i> (e)= .538 <i>p</i> (txe)= .319
How often do you not eat or drink something because you do not want to stain your teeth?***	Health	1.92	1.86	<i>p</i> (t)= .094
	Esthetic	1.78	1.75	<i>p</i> (e)= .306 <i>p</i> (txe)= .565
How often do you use tobacco?***	Health	1.83	1.86	<i>p</i> (t)= .253
	Esthetic	1.63	1.65	<i>p</i> (e)= .294 <i>p</i> (txe)= .810

Note. *** Answers were given on a 5 point scale with 1=never, 2=rarely, 3=nearly every day, 4=every day and 5=more than once a day.

Table 5b

Patients' Average Responses Concerning Oral Health-related Attitudes at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Oral health-related attitudes	Type of education	Baseline	Follow-up	<i>p</i> (time) <i>p</i> (education) <i>p</i> (txe)
How important is to have a healthy mouth?*	Health	4.92	4.92	<i>p</i> (t)= .326
	Esthetic	4.87	4.90	<i>p</i> (e)=.566 <i>p</i> (txe)= .326
How important is it to have White Teeth?*	Health	4.02	4.05	<i>p</i> (t)= .159
	Esthetic	4.12	4.15	<i>p</i> (e)= .479 <i>p</i> (txe)= .988
How important is it to have Healthy Teeth*	Health	4.90	4.89	<i>p</i> (t)= .378
	Esthetic	4.86	4.91	<i>p</i> (e)= .851 <i>p</i> (txe)= .136
How much would you like to receive a whitening treatment in a dental office?*****	Health	3.31	3.33	<i>p</i> (t)= .400
	Esthetic	3.14	3.18	<i>p</i> (e)= .481 <i>p</i> (txe)= .782

Note. Answers were given on a 5 point scale from:

* 1 = not at all to 5 = very important.

***** 1=not at all to 5=very much.

Table 5c

Patients' Average Oral Health-related Quality of Life Responses at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Oral health-related quality of life	Type of education	Baseline	Follow up	<i>p</i> (time) <i>p</i> (education) <i>p</i> (txe)
My teeth and gums limit the kinds or amounts of food I eat*****	Health	2.35	2.29	<i>p</i> (t)= .239
	Esthetic	2.32	2.29	<i>p</i> (e)= .929 <i>p</i> (txe)= .759
My teeth and gums cause discomfort*****	Health	2.37	2.31	<i>p</i> (t)= .360
	Esthetic	2.25	2.22	<i>p</i> (e)= .586 <i>p</i> (txe)= .812
My teeth and gums cause a lot of worry and concern*****	Health	2.65	2.56	<i>p</i> (t)= .030
	esthetic	2.44	2.35	<i>p</i> (e)= .300 <i>p</i> (txe)= .916
My teeth and gums keep me from socializing/going out*****	Health	1.69	1.59	<i>p</i> (t)= .134
	Esthetic	1.50	1.50	<i>p</i> (e)= .351 <i>p</i> (txe)= .134
My teeth and gums make me uncomfortable when eating in front of others*****	Health	1.73	1.68	<i>p</i> (t)= .102
	Esthetic	1.73	1.70	<i>p</i> (e)= .971 <i>p</i> (txe)= .670
My teeth and gums make me uncomfortable when speaking in front of others*****	Health	1.94	1.85	<i>p</i> (t)= .385
	Esthetic	1.80	1.83	<i>p</i> (e)= .682 <i>p</i> (txe)= .062
My teeth and gums make me nervous*****	Health	1.97	1.89	<i>p</i> (t)= .499
	Esthetic	1.83	1.86	<i>p</i> (e)= .646 <i>p</i> (txe)= .095
My teeth and gums make me concerned about the way I look*****	Health	2.45	2.33	<i>p</i> (t)= .046
	Esthetic	2.34	2.31	<i>p</i> (e)= .746 <i>p</i> (txe)= .246
My teeth and gums keep me from enjoying life*****	Health	1.79	1.71	<i>p</i> (t)= .290
	Esthetic	1.55	1.56	<i>p</i> (e)= .223 <i>p</i> (txe)= .177
My teeth and gums interfere with my daily activities*****	Health	1.68	1.63	<i>p</i> (t)= .201
	Esthetic	1.43	1.41	<i>p</i> (e)= .094 <i>p</i> (txe)= .661
My teeth and gums interfere with my intimate relationship*****	Health	1.66	1.58	<i>p</i> (t)= .023
	Esthetic	1.51	1.46	<i>p</i> (e)= .383 <i>p</i> (txe)= .694

Table 5c Continued

Patients' Average Oral Health-related Quality of Life Responses at Baseline vs. Follow-up of Respondents who Received Health vs. Esthetic Education

Oral health-related quality of life	Type of education	Baseline	Follow up	<i>p</i> (time) <i>p</i> (education) <i>p</i> (txe)
My teeth and gums have a bad effect on taste and food*****	Health	1.68	1.61	<i>p</i> (t)= .227
	Esthetic	1.63	1.61	<i>p</i> (e)= .880 <i>p</i> (txe)= .539
My teeth and gums reduce my general happiness with life*****	Health	1.85	1.77	<i>p</i> (t)= .157
	Esthetic	1.65	1.65	<i>p</i> (e)= .354 <i>p</i> (txe)= .157
My teeth and gums affect my life in all of its aspects*****	Health	1.96	1.88	<i>p</i> (t)= .120
	Esthetic	1.84	1.81	<i>p</i> (e)= .634 <i>p</i> (txe)= .515
If you would spend the rest of your life with your teeth and gums as they are right now, how would you feel about it?*****	Health	3.16	3.11	<i>p</i> (t)= .219
	Esthetic	3.38	3.37	<i>p</i> (e)= .167 <i>p</i> (txe)= .408

Note. ***** Answers were given on a 5 point scale from 1=strongly disagree to 5=strongly agree.

***** Answers were given on a 5 point scale with 1=terrible, 2=mostly dissatisfied, 3=mixed, 4=mostly satisfied and 5=delighted.


<p style="text-align: center;">Effects of Teeth Whitening—Internal and Physical</p> <p>Physical Effects:</p> <p>Bleaching results in a few shades of whiter teeth. Methods in the dental office or at home involve use of hydrogen peroxide or carbamide peroxide to lighten the shade of the tooth.</p> <p>Side effects include: increased tooth sensitivity, gum irritation, and deteriorating enamel.</p> <p>Internal Effects:</p> <p>A person's smile reflects their level of confidence. A bright white smile goes a long way!</p>	<p style="text-align: center;">Alternative to Whitening Methods?</p> <p style="text-align: center;">Reduce intake of substances that stain teeth:</p> <p style="text-align: center;">Coffee, tea, tobacco!</p> <p style="text-align: center;">The University of Michigan School of Dentistry Provides Whitening Treatments!</p> <p style="text-align: center;">For more information, contact Dr. Inglehart at: (734)-763-8073</p>	<p style="text-align: center;">Importance of esthetics: How to achieve whiter teeth</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Dr. Marita R. Inglehart & Krupa Patel</p>
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Figure 1a. Esthetic Education. This figure illustrates the esthetic educational information that was provided to the participating patients.





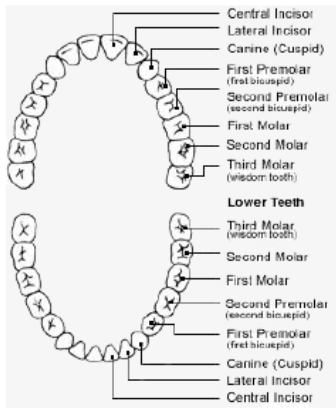
Methods of Teeth Whitening	Methods of Teeth Whitening	Why do Teeth Darken over time?
<p>Office Methods:</p> <ol style="list-style-type: none"> Dentist supervised gel <ul style="list-style-type: none"> - Use: for dark teeth - Treatment duration: 3-6 weeks - Length of results: 3 years - Cost: \$300-500 Chair-side bleaching <ul style="list-style-type: none"> - Use: for very dark teeth - Treatment duration: 4-8 weeks - Length of results: 3 years - Cost: \$300-1000 	<p>Home Methods:</p> <ol style="list-style-type: none"> Brush-on whitening <ul style="list-style-type: none"> - Use: for slightly dark teeth - Treatment duration: 1-2 weeks - Length of results: weeks - Cost: \$3-5 Over-the-counter gel <ul style="list-style-type: none"> - Use: for slightly dark teeth - Treatment duration: 1-3 weeks - Length of results: 1 year - Cost: \$10 Whitening strips <ul style="list-style-type: none"> - Use: for slightly dark teeth - Treatment duration: 1-2 weeks - Length of results: 1 year - Cost: \$15 	 <ul style="list-style-type: none"> • Yellowish tint appears when enamel (white part of tooth) thins, causing dentin (yellowish bone-like material) to show. • Teeth simply darken with age. • Yellow teeth appear in young adults due to staining. <ul style="list-style-type: none"> - Staining can occur inside or outside of tooth as a result of medications taken as baby or diet choices such as soda, red wine, and smoking.
		
		

Figure 1b. Esthetic Education. This figure illustrates the esthetic educational information that was provided to the participating patients.

Adult Teeth


Adults have 32 permanent teeth, classified into 4 types: 8 incisors, 4 canines, 8 premolars, and 12 molars.



**You and Your Dentist
Can Help Achieve
Healthy Teeth and
Gums for Life!**

Local Dentists:
**University of Michigan School of
Dentistry Clinic**
(734)-763-6933


Importance of Healthy Teeth: Practicing Good Oral Hygiene



Tooth Brushing

Brushing your teeth twice a day with a soft brush will keep gums and teeth healthy by removing plaque! To properly brush your teeth, use short, gentle strokes, paying extra attention to the gum line, hard-to-reach back teeth and areas around fillings, crowns or other restoration.

Remember: replace toothbrush when it begins to wear or every 3 months



**Dr. Marita R. Inglehart,
& Krupa Patel**

Figure 2a. Health Education. This figure illustrates the health-oriented educational information that was provided to the participating patients.

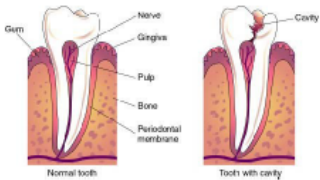
Preventing Cavities- Watch what you eat!

Limit intake of foods and drinks high in sugar, acid, and caffeine. For example, candy, , chips, soda, and coffee.



Also, after eating "sticky" foods such as peanut butter and caramel, try brushing your teeth soon afterward.

Such food provide bacteria with energy to grow, reproduce, and create enamel eating acid.

Remember: the FDA recommends a maximum of 40g of sugar per day (aka one can of regular pop!)



People who drink 3 or more sugary sodas daily have 62% more dental decay, fillings and tooth loss!

Fluoride

Fluoride helps prevent tooth decay by making teeth more resistant to acid attacks from plaque bacteria and sugars in the mouth. It also reverses early decay.

The following household items contain fluoride: water, food, toothpaste, mouth rinse.

A dentist in his/her office can also apply fluoride to teeth as a gel, foam, or varnish.

Fluoride supplements are also available as liquids and tablets and must be prescribed by your dentist, pediatrician, or family doctor.

Flossing

The following are commonly asked questions by patients:

- Which Teeth should I floss?**
You should only floss the teeth you want to keep!
- How often should I floss?**
At least once a day!
- Why should I floss?**
Flossing reduces the number of bacteria which produce acid; this acid deteriorates tooth enamel, thus creating cavities.

Flossing removes bacteria between the teeth, that brushing didn't remove. Brushing with out flossing is like washing only 65% of your body. The other 35% remains dirty!




Figure 2b. Health Education. This figure illustrates the health-oriented educational information that was provided to the participating patients.

*Appendix A**Oral Recruitment Script***UNIVERSITY OF MICHIGAN - SCHOOL OF DENTISTRY****Recruitment script for participating in the study on**

“The effect of oral health-related education on dental patients’

hygiene-related attitudes and behavior – A person-environmental fit explanation”

Names of Researchers:

Krupa Patel, Marita R. Inglehart, Dr. phil. habil.

Hello,

My name is Krupa Patel and I am working with Dr. Inglehart on a research project. We are conducting a study to learn about patients’ motivation and behavior concerning the importance of dental health, of having white teeth, and of having healthy teeth.

If you would like to learn more about our study from me, please feel free to ask me any questions. Here is a consent form that describes the study in more detail. If you are interested in participating in this study, please read and then sign this consent form.

You will also be giving consent to providing us with your phone number so we can call you in one week and ask you some questions in a follow-up telephone survey.

In compensation for completing the survey and participating in a 10 minute educational session, you will receive a free parking voucher for today’s visit.

Thank you for your time!

If patients agree to participate: Present them with the consent form.

*Appendix B**Patient Consent Form***Names of Researchers:**

Krupa Patel, Marita Inglehart, Dr. phil. habil.

Purpose of the research:

The purpose of this study is to explore how a patients' motivation to brush and floss their teeth and the type of education they receive in a dentist's office affect what they will do after the appointment. Two types of motivations will be assessed, namely (a) the patients' motivation related to the appearance of their teeth, especially to the desire to have whiter teeth, and (b) their motivation related to having healthy teeth.

Description of the research project:

Regularly scheduled adult patients (18 years and older) at the University of Michigan School of Dentistry will be able to participate in this study. Patients who participate will fill out a survey at the beginning of their appointment. The survey will include questions about their motivation concerning the importance of dental health, of having white teeth, and of having healthy teeth. At the end of their appointment, patients will receive a 10-minute health education related to practicing good oral hygiene.

One week after their appointment, they will receive a follow-up phone call and will respond to questions concerning their oral health-related behavior and attitudes, their quality of life and how well they know what to do to keep their teeth healthy.

Duration of participation of the subject in the study:

The patients will spend about 5 to 10 minutes completing the survey at the beginning of their appointment. The patients will spend about 10 minutes listening to the education. One week later, the patients will spend about 5 to 10 minutes answering a phone survey.

Risks and discomforts of the research:

There are no more than everyday life / rare risks involved in filling out these questionnaires. One potential risk could be a breach of confidentiality

Expected benefits to subjects or to others:

This study will enable us to find a relationship between patients' oral health-related motivation and their education and how they affect their behavior and attitude. Learning more about this matter can help patients become more motivated to learn about and practice preventive measures.

Costs to subject resulting from participation in the study:

There will be no cost to participate.

Payments to subject for participating in the study:

Patients will receive a parking voucher for completing the survey and participating in the educational intervention and phone survey.

Confidentiality of information collected:

Patients' names and telephone numbers will be obtained at the first appointment in order to allow the researchers to phone the respondents one week later and to ask them some follow-up questions. This information will only be kept until the follow-up survey data have been collected. Once they are collected, the names and phone numbers will be destroyed. Patients will not be identified in any reports on this study. The records will be kept confidential to the extent provided by federal, state and local law.

Availability of further information:

Patients can contact Marita R. Inglehart at (734) 763-8073 or at mri@umich.edu or Krupa Patel at (734) 756-0351 or at patelkk@umich.edu if they have questions about the research. Should they have questions regarding their rights as a participant in research, they can contact the Institutional Review Board (IRB) for the Health Sciences and Behavioral Sciences at 540 East Liberty, Suite 202, Ann Arbor, MI 48104; (734) 936-0933; irbhsbs@umich.edu; Fax: (734) 998-9171.

Voluntary nature of participation:

Participation in this project is voluntary. The services you receive from the University of Michigan Dental Clinic will not be affected in any way by participating in this study. After consent, patients can refuse to participate in the study or can withdraw from the study at any time without penalty or loss of benefits to which they may otherwise be entitled.

Documentation of the consent:

One copy of this document will be kept together with our research records on this study. One copy will be for the patient to keep.

Consent of the subject:

I have read the information given above. I understand the meaning of this information. I have had a chance to ask questions and they have been answered. I understand that I am providing my telephone number(s) for the sole purpose of contacting me for the second survey in one week and that my name and phone number(s) will not be attached to any survey documentation. I hereby consent to participating in this study.

PARTICIPANT:

Printed Name

Consenting signature

Date

Primary Phone Number

Secondary Phone Number

Appendix C

University of Michigan School of Dentistry
Patient Baseline Survey

1. Are you male or female? Male Female
2. What is your ethnic / racial background? _____
3. How old are you? I am _____ years old.
4. Which one of the following two is more important to you? (Please circle ONE)
- Nice looking (Whiter) Teeth OR Healthy Teeth
5. How important is each of the following on a scale from 1 = "not at all" to 5 = "very important"?
- | | Not at all | | | | Very important |
|------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| a. Healthy mouth | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| b. White Teeth | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| c. Healthy Teeth | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
6. How would you describe the health of your teeth and gums?
- | | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| Poor | Fair | Good | Very Good | Excellent |
7. How important is your dental health to you?
- | | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| Not at all | | | | Very |
| Important | | | | Important |
8. Other than today, did you visit a dentist during the last year? Yes No
- If no, why not?
9. How often do you brush your teeth?
- | | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| Never | Rarely | Nearly
every day | Every day | More than
once a day |
10. How often do you brush your teeth with WHITENING tooth paste?
- | | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| Never | Rarely | Nearly
every day | Every day | More than
once a day |

11. How often do you floss your teeth?

- ₁ Never ₂ Rarely ₃ Nearly every day ₄ Every day ₅ More than once a day

12. How often do you eat/drink sugary food/drinks?

- ₁ Never ₂ Rarely ₃ Nearly every day ₄ Every day ₅ More than once a day

13. How often do you not eat or drink something because you do not want to stain your teeth?

- ₁ Never ₂ Rarely ₃ Nearly every day ₄ Every day ₅ More than once a day

14. How often do you use tobacco?

- ₁ Never ₂ Rarely ₃ Nearly every day ₄ Every day ₅ More than once a day

15. Did you / do you use whitening strips? Yes No

If yes: for how many days did you use them? Number of days: _____

16. How much would you like to receive a whitening treatment in a dental office?

- ₁ Not at all ₂ ₃ ₄ ₅ Very much

17. The following questions are concerned with your dental health and how it affects your life. Please tell us, how much do you agree / disagree with the following sentences on a scale from 1= strongly disagree to 5=strongly agree?

- | | Strongly
Disagree | | | | Strongly
Agree |
|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| (a) My teeth and gums limit the kinds or amounts of food I eat. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (b) My teeth and gums cause discomfort. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (c) My teeth and gums cause a lot of worry and concern. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (d) My teeth and gums keep me from socializing/going out. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (e) My teeth and gums make me uncomfortable when eating in front of others. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (f) My teeth and gums make me uncomfortable when speaking in front of others. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| (g) My teeth and gums make me nervous. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |

- (h) My teeth and gums make me concerned about the way I look. 1 2 3 4 5
- (i) My teeth and gums keep me from enjoying life. 1 2 3 4 5
- (j) My teeth and gums interfere with my daily activities. 1 2 3 4 5
- (k) My teeth and gums interfere with my intimate relationship. 1 2 3 4 5
- (l) My teeth and gums have a bad effect on taste and food 1 2 3 4 5
- (m) My teeth and gums reduce my general happiness with life. 1 2 3 4 5
- (n) My teeth and gums affect my life in all of its aspects 1 2 3 4 5
- (o) If you would spend the rest of your life with your teeth and gums as they are right now, how would you feel about it?

₁

Terrible

₂Mostly
dissatisfied₃

Mixed

₄Mostly
satisfied₅

Delighted

Thank you very much for taking the time to fill out this questionnaire. If you want to know more about our study, give us your address and we will send you some more information about this study. If you have any further questions, please, call Dr. Inglehart at (734) 763-8073.

Appendix D

University of Michigan School of Dentistry
Patient Follow-up Phone Survey (after 1 week)

1. How helpful was the education on a scale from 1 = “not at all” to 5 = “very helpful”

Not at all Very helpful
₁ ₂ ₃ ₄ ₅

2. Did your behavior change after the educational intervention? YES ₅ NO ₅

If yes: please explain:

3. Which one of the following two is more important to you? (Please circle ONE)

Nice looking (Whiter) Teeth OR Healthy Teeth

4. How important is each of the following on a scale from 1 = “not at all” to 5 = “very important”?

	Not at all				Very important
a. Healthy mouth	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
b. White Teeth	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
c. Healthy Teeth	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

5. How often do you brush your teeth?

₁ ₂ ₃ ₄ ₅
 Never Rarely Nearly every day Every day More than once a day

6. How often do you brush your teeth with WHITENING tooth paste?

₁ ₂ ₃ ₄ ₅
 Never Rarely Nearly every day Every day More than once a day

7. How often do you floss your teeth?

₁ ₂ ₃ ₄ ₅
 Never Rarely Nearly every day Every day More than once a day

8. How often do you eat/drink sugary food/drinks?

₁ ₂ ₃ ₄ ₅
 Never Rarely Nearly every day Every day More than once a day

9. How often do you not eat or drink something because you do not want to stain your teeth?

- ₁ Never
 ₂ Rarely
 ₃ Nearly every day
 ₄ Every day
 ₅ More than once a day

10. How often do you use tobacco?

- ₁ Never
 ₂ Rarely
 ₃ Nearly every day
 ₄ Every day
 ₅ More than once a day

11. How much would you like to receive a whitening treatment in a dental office?

- ₁ Not at all
 ₂
 ₃
 ₄
 ₅ Very much

12. Did you start to use whitening strips since you saw the dentist last? Yes No

13. The following questions are concerned with your dental health and how it affects your life. Please tell us, how much do you agree / disagree with the following sentences on a scale from 1= strongly disagree to 5=strongly agree?

- | | Strongly
Disagree | | | | Strongly
Agree |
|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (a) My teeth and gums limit the kinds or amounts of food I eat. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (b) My teeth and gums cause discomfort. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (c) My teeth and gums cause a lot of worry and concern. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (d) My teeth and gums keep me from socializing/going out. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (e) My teeth and gums make me uncomfortable when eating in front of others. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (f) My teeth and gums make me uncomfortable when speaking in front of others. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (g) My teeth and gums make me nervous. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (h) My teeth and gums make me concerned about the way I look. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (i) My teeth and gums keep me from enjoying life. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (j) My teeth and gums interfere with my daily activities. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (k) My teeth and gums interfere with my intimate relationship. | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (l) My teeth and gums have a bad effect on taste and food | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| (m) My teeth and gums reduce my general | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |

happiness with life.

(n) My teeth and gums affect my life in all. 1 2 3 4 5
of its aspects

(o) If you would spend the rest of your life with your teeth and gums as they are right now, how would you feel about it?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Terrible	Mostly	Mixed	Mostly	Delighted
Dissatisfied		Satisfied		

Thank you very much for taking the time to fill out this questionnaire. If you want to know more about our study, give us your address and we will send you some more information about this study. If you have any further questions, please, call Dr. Inglehart at (734) 763-8073.