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Brunetto Neves, Paula Cristina; Cortellazzi, Karine Laura; Bovi Ambrosano, Gláucia
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Original Article

The Impact of Motivational Interviewing in Reducing Plaque and Bleeding Indices on Probing in Adult Users of the Family Health Strategy

Paula Cristina Brunetto Neves¹, Karine Laura Cortellazzi¹, Gláucia Maria Bovi Ambrosano¹, Antonio Carlos Pereira¹, Marcelo de Castro Meneghin¹, Fabio Luiz Mialhe¹

¹Piracicaba Dental School, University of Campinas, Piracicaba, SP, Brazil.

Author to whom correspondence should be addressed: Fábio Luiz Mialhe. Faculdade de Odontologia de Piracicaba, Avenida Limeira 901, Areão, 13414-903, Piracicaba, SP, Brasil. Phone: 55 (19) 21065279. E-mail: mialhe@fop.unicamp.br.

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Abstract

Objective: To evaluate the impact of motivational interviewing (MI) in reducing plaque and bleeding indices on probing in adult users of the Family Health Strategy (FHS) with periodontal problems. **Material and Methods:** The study included 68 adult users searching for dental treatment in a family health unit located in Piracicaba, SP, and who had plaque index expressed in percentage greater than or equal to 40% and bleeding on probing greater than 10%. They were randomly divided into control group (CG), which received standard dental care and traditional oral health education and experimental group (EG), which received the same care of CG accompanied by the ME technique. Psycho-cognitive and clinical information of individuals were collected in both groups, such as self-assessment and self-efficacy in oral health, plaque index and gingival bleeding at baseline and at the end of treatment. Data were analyzed using Chi-square and Fisher tests and mixed repeated measures considering the significance level of 5% models. **Results:** We observed statistically significant differences in the 'oral health behavior' 'perception of oral health', 'self-efficacy for oral care', and 'gingival bleeding index' variables on baseline and follow up the impact of the programs. **Conclusion:** Both strategies had an impact on psycho-cognitive and clinical oral aspects of FHU users; however, MI showed better results.

Keywords: Periodontics; Health Education; Unified Health System.

Introduction

Careful and frequent mechanical removal of bacterial biofilm is a prerequisite for maintenance and improvement of periodontal conditions [1]. However, a large part of the population still has difficulties in lastingly joining an effective regime of oral hygiene habits [2].

In an attempt to change this situation, dental professionals use traditional educational activities based on transmission of knowledge, assuming that increase it should lead the patient to behavioral changes [3]. However, it is necessary to recognize that human behavior is complex and is influenced by various psychological, economic and cultural determinants [1]. Therefore, individuals who, even living in adverse situations, can develop self-management mechanisms and are generally more successful in achieving healthy lifestyles than those without these characteristics [2,3].

Therefore, user-centered interventions are increasingly incorporated in health promotion programs, through psycho-cognitive approaches, in which the professional acts as a facilitator, helping people to recognize their problems and to seek knowledge and skills required to make necessary changes [2,3].

Among the recent cognitive approaches used in health care and dentistry, there is the Motivational Interviewing technique (MI), a person-centered, cognitive behavioral approach, which fosters intrinsic motivation to change through exploration and resolution of personal ambivalence and used to enhance intrinsic motivation for changes, strengthening its active role in courses of action [3-5]. It is developed through brief counseling sessions that involve a collaborative partnership focused on setting objectives for the individuals and their self-management [6]. In those sessions the health care professional helps individuals to express their reasons for and against the behavioral change, and to reflect whether their current behaviors are in conflict with their personal objectives and values related to health. Therefore, the implicit assumption is that behavioral change should occur when the individuals reflect on the discrepancies between their actions and whatever is understood and overcome by the individuals, of their ambivalence to change [6].

When applied to the dentistry field, the professional requires only 3-15 minutes of interaction with the individual, and MI may be conducted in each clinical treatment session [7]. MI implementation in dentistry is based on five principles that can vary depending on the author: establishing an empathetic relationship; exploring and developing ambivalence/discrepancies; handling resistances; supporting self-efficacy and optimism; monitoring [3,7,8].

Initially, the professional must establish an empathetic relationship with the person, showing a genuine concern for their problems, with no judgment, resisting the idea of trying to fix things through the professional point of view. This process aims to develop a relationship of trust essential for the individuals to feel genuinely assisted and understood, with their autonomy and choices respected, fundamental characteristics for the joint construction of change processes [8]. Thus, it is necessary to avoid judgments, no matter how the individuals' responses conflict with professional opinions, because the MI principle recognizes that people value their independence and are often reluctant to follow advice from strangers, even those who have expertise in the subject, as in health

professionals [3,4,8]. Therefore, we understand that individuals' resistance to changes recommended by the professionals is usual and expected when the counseling process occurs with no prior establishment of a therapeutic alliance [8].

The second principle aims to create discrepancies between individuals' current behaviors and their objectives and values. For this, the professional should elaborate open-ended questions that encourage individuals' frank and open exposure views on their problem and at the same time, awaken their conscience on the issue and the consequences of not acting [3,4,8]. As the conversation unfolds, the professional resumes or simply reaffirms the individual's thoughts, resisting addressing his/her point of view on what should be done. When listening to their own motivations for change, and again by the professional, the individuals become more aware and motivated to change. Reflective listening is extremely important at this time because formulating the right questions should trigger individual awareness on the problem and the consequences of not taking the necessary measures.

The third general principle recognizes that resistance to change may occur and the professional must be aware of it. Trying to persuade the individuals to change or say that they must accept and understand can lead to negative feelings and increase failure. Thus, accepting and dealing with resistance reduces those feelings and promotes future possibilities of new conversations.

The fourth principle is related to support and increase self-efficacy. The individuals are then advised to take action or change; their choices are explored and a course of action is developed in order to meet their needs. Given the multifactorial nature of oral diseases, it is considered useful that the professional uses a "menu" or "checklist" containing a number of options to be explored along with the subject. The fifth principle refers to the importance of counseling, since the process of change provided by MI does not occur in just one session and thus, subsequent meetings are required for the professional to review and give the necessary support to the change process [8].

Despite the promising results [9], most studies that used the MI technique in dentistry and in patients with periodontal problems was developed in the USA and Europe, and applied to individuals who sought care in dental schools clinics [2,5,10-12].

That said, there is, to date, national studies that investigated and compared MI effectiveness compared to traditional health education in improving cognitive variables and dental clinics of the Unified Health System (UHS) users.

Thus, as the need to transpose into health service scientific knowledge produced in academia, in order to improve effective health practices for society [13] the aim of this study was to evaluate the impact of two educational approaches in oral health on cognitive and clinical aspects of adult users of UHS and with periodontal conditions.

Material and Methods

This study is a quasi-experimental clinical trial and was conducted in a Primary Health Unit – Family Health (PHU-FH) in an outlying neighborhood of the city of Piracicaba, SP, which in 2012 had a territory composed of 1,051 families, totaling 3,926 individuals, with most aged between 20

and 39 years. The project was approved by the Ethics Research Committee of FOP-Unicamp (protocol 115/2011).

Sample selection

From December 2011 to August 2012, 100 adult subjects aged between 18 and 66 years sought the PHU-FH dental services for treatment. Of these, 70 individuals had the inclusion criteria for this study: plaque index expressed as percentage (PI%) greater than or equal to 40% and gingival bleeding index after periodontal probing higher than 10% [5,14]. Users could not have physical limitations that prevent them from adequately perform oral hygiene procedures, or experience any cognitive problem that offered understanding difficulties in relation to the guidelines provided by the professional regarding oral health maintenance. In addition, they had to have at least 12 natural teeth in the oral cavity and at least one of index teeth for evaluating the biofilm and gingival indices. Still, they could not have any systemic disorder which could interfere on periodontal health-disease process as *diabetes mellitus* or uncontrolled systemic arterial hypertension, and also could not have routine systemic medication which could cause interference in periodontal conditions, such as sodium phenytoin, an anticonvulsant used in epilepsy treatment, cyclosporine and nifedipine, an antihypertensive blocker of calcium channels. Pregnant were also excluded from the sample [3,5,14,15].

The selected individuals who agreed to participate in the study were divided into CG group (control group) and EG (experimental group) as a demand for care, one for each group. Among them, two users dropped from the study, and thus, the CG and EG groups had 33 and 35 subjects, respectively, totaling this study sample.

Data collection and interventions

The CG received the conventional dental clinical treatment associated with periodontal disease cause and education in traditional oral health through the provision of standardized information on the disease and how the person should take action to control it.

The EG also received conventional dental clinical treatment associated with periodontal disease cause and traditional oral health education; however, it received complementary action through the MI technique.

All interventions and data collection were carried out by a specialist researcher in periodontics, master in public health who received previous training for intervention application and for data collection in an impartial manner in order to reduce performance and detection biases.

First visit to the two groups

During the first consultation these procedures were performed: filling of historical medical records, clinical examination for dental treatment identification, and presentation and signing the free and clarified consent term.

During the clinical examination it was collected plaque index [16], expressed as percentage, and gingival bleeding index after periodontal probing in order to assess the gingival health situation [17].

After the clinical examination, the researcher applied a questionnaire to the EG and CG subjects in order to collect sociodemographic and economic information such as gender, age, education, marital status, income and housing type [18]. Then, a second questionnaire was applied as a conversation, to collect psycho-cognitive information. 1. *Oral health knowledge*: Do you know which diseases can occur in your mouth (teeth and gums)? Do you know if they can cause damage to your mouth? (yes/no); Do you know how they start, how they occur? (yes/no); Do you know if they can be avoided? (yes/no); Do you know how to avoid them? (yes/no); 2. *Oral health behavior*: How often do you brush your teeth (only 1 time / more than 1 time) and floss (do not floss or do it only occasionally / floss 1 time a day or more); 3. *Self-perception of oral health quality*: How do you rate your oral health? (very good or good / not very good or bad); 4. *Self-efficacy perception to take care of oral health*: Do you think you can take good care of your teeth? (yes/no); Do you think it is good the way you clean your teeth? (yes/no); Do you think the way you take care of your mouth is effective in preventing oral diseases? (yes/no). These questions were reproduced from previous studies [2,5,15,18-19,25], which assessed their validity measures, translated into Portuguese and pre-tested in a sample of users who have not participated in the survey, in order to assess the quality of cultural adaptation and the questions comprehensibility. After application we observed the need for adjustments. In relation to dichotomous answers to the self-efficacy questions, they were prepared based on Maibach and Murphy discussions [20].

From the second consultation

Clinical interventions

In the groups, when it was necessary, there was oral cavity adaptation (caries removal and provisional restoration), contouring and polishing of maladapted restorations, removal of residual roots and supra and subgingival calculus, mechanical debridement of root surfaces in areas with periodontal pockets, and tooth extractions, when indicated.

The number of return clinical visit sessions was planned according to each individual's needs, ranging from four to six sessions from both groups.

Educational interventions

CG – education in traditional health

Oral health education approach, used for this group, was based on *The Swedish dental health programme for adults* [21] and other studies with adults [5,22].

According to the above reference, it is necessary to provide information to the subject on the etiology of major oral diseases such as caries and periodontal disease (for this study, especially problems related to periodontics) to enable the subject understanding regarding to recommendations

made by the dentist in order to improve oral health and to realize that it is possible to prevent these diseases through self-care procedures, such as proper oral hygiene.

In addition, the biofilm should be shown to the subjects and they must be instructed with a proper tooth brushing technique, how to perform proper removal, and instructed to the use of interproximal cleaning methods such as dental floss and interdental brush, when indicated. They also must be guided on the signs of the disease by using a face mirror while the clinical examination is carried out, for example. The dentist can show the subjects the healthy areas and areas compromised by the disease, teaching them to recognize the differences. Then the clinical examination results should be presented to the subject, informing them regarding their oral health condition, so they could be familiar with the situation [22].

After that, the reasons for the presence of the disease and its specific location must be described. The user should know that if the biofilm is not properly controlled, may initiate and maintain inflammatory changes in the gums, which can lead to destruction of insertion tissues.

Following, the subject can identify the biofilm accumulation areas associated with the disease presence, as well as areas with less biofilm accumulation and disease absence, for comparison. At this point, the subjects must be aware that their active participation during treatment is essential for successful treatment [22].

Therefore, each CG individual underwent clinical examination, the oral health condition was presented using a mirror, and it was explained the biofilm role in the development of periodontal diseases such as gingivitis and periodontitis, and their possible consequences (bleeding, loss of bone supporting, tooth mobility, loss of function and tooth loss), causing them to recognize the importance of conducting a proper daily oral hygiene. That information aimed at motivating the subject to cooperate with treatment [22].

After being informed of their oral health and the etiology of periodontal problems as well as their possible consequences, the subjects received instructions on how to conduct a proper oral hygiene to control biofilm and prevent the occurrence of disease. The tooth brushing technique adopted was the Bass technique, as well as the use of dental floss and interdental brush, when indicated [1]. The educational intervention usually occurred in only one of the treatment sessions.

EG – health education developed through motivational interviewing

For this group, the education approach in traditional oral health was developed with the MI technique application.

MI application by the researcher in the EG

The MI technique was applied to the EG subjects in subsequent return clinical visits. With the information from the initial questionnaire, the professional could identify knowledge and behavior in oral health, self-perception of oral health and self-efficacy for oral care of the subjects before starting educational interventions. Shortly after, a mirror was used as a resource so that the subjects could watch their mouths and possible diseases (gingivitis, periodontitis, caries) [4,7,8].

Showing bleeding on probing or biofilm in periodontal probing after the professional went through teeth surfaces were methods used to show the problem and started a discussion on the degree of oral hygiene and the relationship between the presence of biofilm and gingivitis, periodontitis and caries. The subjects were then encouraged to reflect on whether their oral health was good, if they felt satisfied, or if there was any discomfort or something they wanted to be different with respect to their oral health status. Then they were asked on their expectations for dental treatment and what they would be willing to do to contribute to their oral health improvement [4,7,8].

When informing on oral diseases, their etiology, consequences and prevention (including positive behavior in relation to oral health, such as regular and adequate control of biofilm), previous subjects' knowledge was taken into account in relation thereto, in order to avoid repetitive and uninteresting conversations. This practice occurred gradually, during each clinic session in which the subject returned to treatment, continuously and briefly [4,7,8].

After identifying the biofilm, the different instruments that could be used in oral hygiene were presented to the subjects, and they could select one of the tools to help them (toothbrush, interdental brush – if needed – and dental floss) which were provided them during the consultation. The subjects were educated and trained as the best way to use the chosen tool and tried to incorporate the new learned practice into their daily routine. The professional helped them to analyze and choose which times of the day and where, for example, it would be easier to practice the new way to sanitize the mouth, taking into account working hours or other activities that were part of their day by day, so that difficulties would be as small as possible and, thus, less likely to not practice the new technical. The subjects could train the use of each instrument oriented until the next appointment, in which another instrument was chosen and new training conducted [4,7,8].

After being oriented on the use of toothbrush, dental floss and interdental brush (when indicated), the subjects were instructed to use them in coordination. The objective was to introduce correct and appropriate ways to gradually control biofilm, and always helping the subjects to identify ways and periods of oral hygiene practice, with minimum interference in their daily routine, so that the self-care process in oral health could be developed the most natural way possible and could become a new habit [4,7,8].

At the end of each session, the subjects were asked if they were using the oral hygiene tools as oriented and if they could observe positive changes in relation to oral health conditions. When appropriate, their self-efficacy perceptions for hygiene were noted and remembered during subsequent sessions in order to motivate them in maintaining appropriate behaviors in relation to oral hygiene. New guidelines on the use of each method and discussion on the best times to oral hygiene activities were conducted when necessary. It was always observed if the actions the subjects were doing to improve their oral health were in accordance with their objectives in relation to treatment successful and oral health maintenance. Also, the subjects were always encouraged to expose their difficulties so that the professional could help them find new solutions to the problems

identified, including by informing that relapse could happen and that this should not be reason to discourage the habit [4,7,8].

As we already reported, in order to evaluate psycho-cognitive changes following interventions in both groups, the same questionnaire applied at the beginning of the treatment was applied at the end of the dental treatment for both groups.

Clinical outcomes

At the end of the counseling period, clinical outcomes were evaluated by means of a plaque index (PI) of Silness & Loe [16], expressed as percentage (PI%), and by gingival bleeding index after periodontal probing (PP) of Lenoxe Kopczyk [17].

Data analysis

The same tests were applied to compare the variables related to knowledge, behavior, self-perception and self-efficacy in oral health in the groups at baseline and after the dental treatment.

For statistical analysis, the variables were initially categorized according to criteria used in previous studies [14,15,20,23,24]. In order to assess improvement or worsening of the behavioral variables daily 'number of brushing' and daily 'flossing', we compared the number of times reported at the end and at the beginning of the interventions. An increase in the absolute number represented improvement in the two behaviors. On other psycho-cognitive variables, these were dichotomized as follows; the outcome categorized as 0 is the worst and 1 is the best: How do you consider your oral health? (0=regular; bad / 1=excellent; very good; good); Do you believe you can take good care of your teeth? (0=no/1=yes); Do you think it is good the way you clean your teeth? (0=no/1=yes); Do you think it is effective the way you take care of your mouth in preventing oral diseases? (0=no/1=yes); Do your gums bleed when you brush your teeth? (0=no/1=yes); Do you consider any benefit in the habit of brushing teeth? (0=no/1=yes); Do you know which diseases can occur in your mouth? (0=no/1=yes); Do you know how these diseases can be prevented? (0=no/1=yes); Do you know how to avoid them (0=no/1=yes). Thus, depending on the individual response to the end of the dental treatment, the outcome improved or remained the same standard as the baseline.

In order to verify the degree of similarity of sociodemographic, economic and tobacco use between the CG and EG at baseline, we applied the Chi-square test or Fisher's exact test. The same tests were applied to compare the variables related to knowledge, behavior, self-perception of oral health quality, self-efficacy perception of oral health.

The plaque and bleeding on probing indices as percentage were analyzed using mixed models for repeated measures by the PROC MIXED of the SAS program (SAS version 9.2). For all analyzes, we considered 5% of significance level.

Results

Characteristics of individuals at baseline

There were no significant differences in terms of gender, age, education, marital status, housing type, home density, and familiar income variables between CG and EG ($p>0.05$). Overall, 69.11% of subjects had a family income of up to two minimum wages and 48.52% studied up to the elementary school.

On clinical features, we observed that 90.9% of CG individuals and 85.71% of EG had supragingival calculus ($p=0.08$), while 52.42% of CG and 65.71% of EG had subgingival calculus ($p=0.024$). There were no statistically significant differences between the biofilm index and gingival bleeding between the groups at baseline ($p>0.05$).

Interventions impact on the individuals' psycho-cognitive aspects

The data in Table 1 show that, overall, both interventions had an impact on improving knowledge, behavior, self-perception and self-efficacy perceived in oral health.

Table 1. Chi-square test or Fisher's exact test to compare CG and EG groups as the behavioral, self-perception, self-efficacy and oral health knowledge variables.

Variables	Improved		Kept the same		p-value
	n	%	n	%	
How many times a day do you brush your teeth?					
CG	31	93.93	2	6.07	0.2318
EG	35	100	0	0	
How many times a day do you floss?					
CG	22	66.67	11	33.33	0.1233
EG	29	82.85	6	17.15	
How do you consider your oral health?					
CG	24	72.72	9	27.28	0.0214
EG	33	94.29	2	5.71	
Do you think you can take good care of your teeth?					
CG	23	69.70	10	30.30	0.0313
EG	32	91.42	3	8.58	
Do you think it is good the way you clean your teeth?					
CG	22	66.67	11	33.33	0.0411
EG	31	88.58	4	11.42	
Do you think it is effective the way you take care of your mouth in preventing oral diseases?					
CG	24	72.72	9	27.28	0.0214
EG	33	94.29	2	5.71	
Do your gums bleed when you brush your teeth?					
CG	21	63.64	12	36.36	0.1328
EG	28	80.00	7	20.00	
Do you consider any benefit in the habit of brushing teeth?					
CG	29	87.87	4	12.13	0.1913
EG	34	94.14	1	2.86	
Do you know which diseases can occur in your mouth?					
CG	20	60.60	13	39.40	0.8486
EG	22	62.85	13	37.15	
Do you know how these diseases can be prevented?					
CG	29	87.88	4	12.12	0.4212
EG	33	94.38	2	5.72	
Do you know how to avoid them?					
CG	28	84.85	5	15.15	0.4705
EG	32	91.43	3	8.57	

At baseline, 81.8% of CG participants and 85.7% of EG group said they brushed their teeth more than once a day, however, only 27.3% of the CG and 17.1% of the EG used dental floss at least once a day. After the interventions, 93.93% of the CG individuals and 100% of EG individuals began to brush their teeth more than once a day. Furthermore, 66.67% of CG and 82.85% of EG changed frequency of flossing for at least once a day.

In relation to self-perception on oral health, at the beginning of the interventions 30.30% of CG individuals and 25.71% of EG subjects considered their oral health as excellent, very good or good. After the interventions, 72.72% of CG and 94.29% of EG started having this perception.

At baseline, 54.54% of CG individuals and 62.85% of EG reported they took good care for their teeth. After the interventions, 69.70% of CG and 91.42% of EG started having this perception.

Regarding oral hygiene, 51.51% of CG individuals and 42.85% of EG reported they took good care of their teeth at baseline. After the interventions, this perception increased, as 66.6% of CG individuals and 88.58% of EG started having this perception.

Regarding effectiveness perception on how to take care of the mouth to prevent oral diseases, at baseline, 42.42% of CG individuals and 48.57% of EG reported they performed effective actions for that outcome. After the interventions, this perception increased to 72.72% in CG and 94.29% in EG.

In relation to gums bleeding when brushing the teeth, 60.60% of CG individuals and 54.29% of EG stated 'yes' at baseline, as well as 60.60% of CG individuals and 71.42% of EG stated their gums bled when flossing. After interventions, we observed that these percentages decreased to less than 37% in both groups.

Regarding knowledge on oral health, we observed improvements ranging from approximately 18 to 34% in both groups after the interventions; however, there were no statistically significant differences between the groups in relation to this variable after treatment.

Thus, the group which received MI, in addition to achieve a higher improvement percentage in all psycho-cognitive categories compared to the control group, showed statistically significant differences for issues related to self-perception on oral health: *How do you consider your oral health?* ($p=0.0214$) and self-efficacy in oral health: *Do you think you can take good care of your teeth?* ($p=0.0313$); *Do you think it is good the way you clean your teeth?* ($p=0.0411$); *Do you think it is effective the way you take care of your mouth in preventing oral diseases?* ($p=0.0214$).

Interventions impact in reducing biofilm and bleeding on probing

Table 2 presents the data on plaque index (PI) and Table 3 shows the data on gingival bleeding after periodontal probing (PP) between groups at baseline and after treatment.

We observed a decrease in the values of the two indices in each group (CG and EG) between baseline and the end of treatment, indicating improvement of clinical indices, and intra-group differences between baseline and the end of treatment were statistically significant.

There was no statistically significant difference between the PI and PP values between groups at the end of treatment. However, the percentage reduction was much more significant in the MI group, in which there was a decrease of 45.34% in the plaque index vs. 31% in the control group. Similarly, there was a 69% reduction in gingival bleeding index in the MI group vs. 39% in the control group.

Table 2. PI average% (standard deviation) according to Group and time.

Group	Time		p-value
	Baseline	Treatment outcome	
Control	69.82 (16.70)	47.61 (23.34)	<0.0001
Experimental	72.62 (16.58)	39.69 (22.18)	<0.0001
p-value	0.8985	0.4828	

Table 3. Bleeding probing ratio (%) average (standard deviation) according to Group and time.

Group	Time	
	Baseline	Treatment outcome
Control	21.35 (10,84) Aa	13.03 (7.98) Ba
Experimental	29.91 (20,37) Aa	10.80 (10.52) Ba

Average followed by different letters (horizontal upper case and upright lower case) are different among each other ($p \leq 0.05$).

Discussion

To our knowledge, this is the first study conducted in Brazil in the dental field and with UHS users, which assessed the effectiveness of motivational interviewing strategy, compared to a traditional educational strategy, in psycho-cognitive variables and clinical indices of individuals with periodontal issues.

Most studies conducted to date in dentistry, using the MI technique, were held in dental schools, according to methodological models that evaluated the effectiveness of interventions [2,5,10]. However, it is necessary that intervention results conducted under ideal conditions are tested in services and in populations with different socioeconomic and cultural levels, in order to provide effective ways of incorporating these technologies into practical services.

In the present study, the population studied were from 18 to 66 years, with 69.11% of family income up to two minimum wages (R\$ 1,090.00), 48.52% with incomplete primary school education and only 4.41% with college education, that is, with distinctive characteristics of the samples of studies evaluating MI effectiveness in adults in other countries such as the USA studies [12] and Sweden [2,5], that is, countries with socioeconomic indicators superior to those in Brazil. In addition, participants of the studies cited had at least the first level of education completed and many of them completed college, a fact that may have contributed to their better understanding on the interventions and on their cognitive abilities to reflect and incorporate new health habits into their routines.

Although the two groups had improvement in clinical indices, we observed that the MI group had the greatest impact in reducing bleeding on probing rate than in plaque index, although there were no statistically significant differences between the groups at the end of treatment. We

understand that health status or oral disease is better assessed by the gingival bleeding index, as the plaque index has the disadvantage of showing only the situation during the examination when evaluated separately, and may not reflect the oral hygiene behavior of the subject. The gingival bleeding index is, therefore, of great clinical importance since it demonstrates the real subject habit when controlling plaque [15].

Similarly to this study, others, when comparing an oral health education program based on MI with an education program in standard oral health, found that the group receiving the intervention by means of MI had lower gingival bleeding values after periodontal probing, when compared to the group that did not receive this intervention, demonstrating that MI effectiveness is higher than traditional oral health education to promote improvements in periodontal conditions. However, we observed the same trend in a study that used MI in a single session [10,25].

In relation to intervention effectiveness in psycho-cognitive aspects on oral health, the results showed that EG had statistically significant improvements in self-perception and self-efficacy variables perceived in oral health in relation to CG, improving self-confidence and self-image of individuals to deal with situations related to maintaining oral health, important psychological attributes related to the self-empowerment state [26,27]. The self-empowerment process involves modifying the way people feel about themselves through self-awareness and self-esteem processes. Studies show that positive self-evaluation in positive oral health is considered an important predictor of a better psychological well-being, self-esteem and life satisfaction over time [27-29]. Similarly, self-efficacy is considered an important key element of motivation for health changes, and studies indicated that the higher the perceived self-efficacy, that is, the individual's feeling on trusting his/her abilities to take the necessary actions to improve and maintain health, the greater the level of perseverance and persistence to performed certain behavior or activity [30]. In the dentistry area, perceived self-efficacy, characterized as the person's confidence to perform certain judgment of personal capabilities to organize and execute actions was linked to better behavior on oral health and an important predictor variable of completion on long-term periodontal treatment [30].

Therefore, the group exposed to MI strategy showed significant statistical differences in relation to CG at the end of treatment compared to psychological attributes considered important for maintaining long-term clinical parameters related to periodontal health [30].

This study has some limitations such as the small number of evaluated subjects and short follow-up time. We recommend, therefore, that further studies be carried out with more subjects of the services offered by FHS, in order that the findings in clinical trials, generally carried out in educational institutions in developed countries, may be transposed to the UHS context, improving the population oral health care.

Conclusion

We conclude that both educational strategies impacted on psycho-cognitive aspects, biofilm levels and bleeding on probing in adult users of the FHS; however, the motivational interviewing strategy showed better results.

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