An intervention program to reduce dental avoidance behaviour among adolescents: a pilot study

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ABSTRACT. Aim To develop and test the methodology of an intervention to reduce avoidance of dental care among adolescents, and to measure the respondents' beliefs regarding the intervention (credibility and cognitions). Methods Based on a group comparison design a sample of 18 year olds (n=50) with dental non-attendance behaviour was randomly selected to three experimental and one control group. Subjects were surveyed with one baseline questionnaire and one post-intervention questionnaire, to evaluate their beliefs regarding the program. Two different instruments were tested: 1) cards representing different statements related to previous dental experiences, possible reasons for attending (pros) and not attending (cons) dental appointments, and preferences for future treatment. Cards were selected based on individual priority; 2) a brief, structured telephone interview based on Motivational Interviewing. The instruments were tested separately (groups I and II) and in combination (group III). Subjects in the control group (group IV) were given conventional health education. Results Subjects in the experimental groups had significantly higher credibility scores to the statement “How much easier do you perceive dental treatment to be for you, based on this program”, compared with the control group (p<0.05). They had also more positive beliefs to the statement “I think the interviewer liked to talk to me” (p<0.05) than controls. Conclusion A questionnaire sent to non-attending adolescents followed by a brief telephone call based on Motivational Interviewing appears to be a credible intervention for adolescents avoiding dental care.

KEYWORDS: Dental avoidance, Adolescents, Pilot intervention.

Introduction

In previous studies [Skaret et al., 1998a, b] we have identified a substantial frequency of missed/cancelled dental appointments among Norwegian adolescents, and a variety of reasons for this behaviour [Skaret et al., 1999]. The present study is part of a program aimed at reducing this frequency by testing out different intervention programs. Despite documentation that substantial resources in the public dental health care are lost due to the amount of non-attendance [Wang and Schiøth, 2000], few efforts have been made to systematically develop and evaluate interventions aimed at reducing the non-attendance behaviour among adolescents. A straightforward advice-giving approach may be of limited value [Rollnick et al., 1992], and many patients have reservations about “being told what to do” [Stott and Pill, 1990]. There is also a possibility that direct persuasion, whatever the degree of readiness to change, pushes the patient into a defensive position.

Motivational Interviewing (MI) is a type of counseling intended to deal with an individual’s resistance to behaviour change, and the intervention has been successful when working with specific groups, e.g. substance users [Stein et al., 2002]. The approach is essentially a combination of cognitive and behavioural techniques. The MI approach utilizes stages of change theory [Prochaska and DiClemente, 1984] in which patient ambivalence, the pros and cons associated with a decision to change, is assessed. MI provides empirically-based strategies to move patients from ambivalence to change. According to Miller, while the motivation for change comes from the patient, the counselor helps create, by skillful questioning and reflection, the expectation of change.

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Adolescent health compromising behaviours are not yet fixed [Joffe et al., 1988], and MI seems to be especially useful in the early stages of change, that is when adolescents are considering change [Berg-Smith et al., 1999]. MI provides personalized feedback, and evaluations indicate that MI is especially effective in overcoming resistance of adolescent ambivalence to behaviour change. Brief counseling is also considered to be developmentally appropriate for adolescents [Berg-Smith et al., 1999], and a patient centered approach that enhances the sense of personal control may avoid the usual response to adult figures [Tober, 1991]. While adolescent studies are limited, the MI approach, with its self regulation theoretical framework, appears promising for an application to adolescent dental avoidance.

A number of studies have indicated that perception of control in the dental situation is associated with anxiety and attendance [Logan et al., 1991; Milgrom et al., 1992; Law et al., 1994]. Strategies to reduce fear and to enhance control have been suggested, assessed and promoted in the literature [Milgrom and Weinstein, 1995; Weinstein, 1990]. MI may offer a possibility to combine a fear reducing focus with enhancing the adolescents’ sense of control in the dental operatory. For example, Milgrom et al. [1992], in a large representative study of Singapore adolescents, found the construct of control to have important implications. Findings suggested that the probability of avoidance is enhanced when perceptions of control are low. The construct of control may also be readily rendered operational in dental care settings, allowing a number of potential interventions. The ability to provide effective counseling without time consuming face to face interaction is important in impacting the incidence of dental avoidance. Pilot work, as a case control study conducted in rural Washington State [Skaret et al., in press], found that adolescents with visible untreated decay, in addition to having cognitions and a family history congruent with dental fear and avoidance, were socially isolated and generally avoidant, compared with children with similar levels of treated caries.

Assessment of adolescent perceptions regarding dental services is useful prior to a MI intervention, as it quickly pinpoints the pros and cons associated with the decision to attend the dental clinic. Moreover, the assessment may itself serve as the motivational basis of an intervention with minimal professional interaction and costs. Subsequent clinical interactions can then proceed to facilitate patient needs. An instrument that can be used to collect these individual experiences, pros and cons and future preferences, without direct questioning is needed.

The present pilot study had the following aims: 1) to develop and test the methodology of an intervention; 2) to measure the respondents’ beliefs regarding the intervention (credibility and cognitions).

**Materials and methods**

**Sample.** In the Norway Public Dental Service, patients are recalled and scheduled for dental appointments by post. For most age groups these routines are on a yearly basis. A convenience sample of 18 year old subjects (n=50) who had one or more missed appointments during the previous four years were selected for the study. The lists of subjects already existed before the study started, and included information about the total number of scheduled and missed dental appointments during the previous four years.

**Study design.** A group comparison design was used to compare three experimental and one control groups. The subjects were randomly assigned to the four groups, and surveyed with a baseline questionnaire, followed by a brief telephone call. The respondents’ beliefs about the program were then measured by a post-intervention questionnaire.

**Intervention.**

Group I: Response Cards (RC). Subjects in this group received (together with the baseline questionnaire) a printed booklet with removable cards (stickers). Each card represented one specific statement related to either: previous dental experiences (red cards); possible reasons for attending (pros) and not attending (cons) dental appointments (green cards); or preferences for future dental appointments, including factors that have been shown to improve the feeling of being able to cope with dental treatment (blue cards). Subjects were asked to select 3 cards of each colour, based on their own priority, and then put the cards on a sheet of paper (prepared spots for 9 cards) and return it together with the questionnaire.

Some of the cards were “open” to give the respondents the opportunity to make their own cards in case they
did not find any statements representing their own opinion. This instrument had been developed for the present study.

Group II: Motivational Interviewing (MI). Subjects in this group received a brief, structured telephone interview, based on the MI approach. Also included were empirically based strategies for reducing anxiety/increasing perception of control, focusing on the impact of dental avoidance.

Group III: Combined treatment (Comb). Subjects in this group received both the RC and the MI structured telephone call.

Group IV: Controls. Subjects in the control group were given conventional health education by phone (e.g. stressing the importance of visiting the dentist regularly and having regular home care habits).

Questionnaires. The baseline questionnaire included the following items:
- demographics (gender, occupation);
- painful experiences at last dental appointment;
- self reported reasons for non-attendance behavior.

In addition, the following psychometric instruments were included: Dental Fear Survey [Kleinknecht et al., 1973] and Dental Beliefs Survey [Smith et al., 1987].

The Post Intervention questionnaire sought respondents’ beliefs about the program (credibility and cognitions), which were measured by a modified Credibility scale (C-scale) [Ost et al., 1998, originally from Borkovec and Nau, 1972] and a modified Weinberger Adjustment Inventory scale (WAI-scale) [Weinberger, 1996]. The C-scale contains 5 items with a 10-point Likert format. Subjects were asked to estimate how successful they expected the program to be (range 5-50, with a higher score representing higher credibility). The modified WAI-scale contains 12 questions with a 7-point Likert format. The WAI-scale measures perceptions about the interview as well as the interviewer (range 12-84, with a higher score representing more negative opinion).

Procedure. In Part 1 of the study all subjects received the baseline questionnaire by post. The purpose of the study was outlined in a written enclosure and subjects were asked to return the enclosed material, and to participate in a brief telephone interview. Permission to be contacted by phone was given by signing and returning an enclosed card (in a specific envelope), in accordance with requirements for approval by the Research Ethics Committee and Norwegian Social Science Data Services. An initial incentive of NOK 300 was offered to all the subjects who participated in parts 1-3 of the study. Reminders were sent to their homes according to a modified version of the Total Design Method [Dillman, 1978].

In Part 2, subjects in all groups were called by phone. For group I the subjects were interviewed about their selection of cards and if they wanted the cards to be sent to the dental clinic, including a plan to modify the dental procedure based on their card priorities. In groups II and III the interview was based on the MI approach, and in group III (Comb) the MI interview was also based on the information already collected by the RC. Subjects in group IV (Controls) were only given ordinary health education (e.g. stressing the importance of attending dental appointments, brushing regularly).

All subjects were encouraged to return the next questionnaire (post-intervention), and thereby be qualified for receiving the incentives. The participants were asked about possible preferences related to the age and gender of the interviewer. The first author (ES), who had received training in practicing brief MI technique, did all the interviews.

In Part 3 of the research the post-intervention questionnaire was sent to the participants by post. The short questionnaire measured the respondents’ credibility (C-scale) [Ost et al., 1998] and cognitions related to the intervention (WAI-scale) [Weinberger, 1996].

Statistical analyses. The data were analyzed using SPSS (version 9.0). Bivariate relationships between variables were analyzed with Pearson’s correlation, and group differences with One-Way ANOVA.

Results

Response rate. Five pre-intervention questionnaires were returned with unknown addresses. Only 31% (14/45) returned the questionnaire after the initial mailing. After the first and second reminder another 5 and 8 subjects, respectively, responded. The introduction letter in the third reminder announced an incentive of NOK 500 (increased from 300) for responding to all the three parts of the study, and the opportunity to respond only to one part of the study with an incentive of NOK 200. This letter also announced the opportunity to return a letter explaining why they decided not to participate in the study. This recruited another two responders, giving a final response rate of 64% (29/45). No gender difference was found between respondents/non-respondents or between subjects in the four groups. As shown in Table 1, 42% of the sample (19/45) completed the third part of the study (13 females and 6 males).
Non-attendance behaviour and self-reported reasons. The mean number of missed dental appointments during the previous four years was 2.8 (range 1-11, n=29), with no differences between groups. The most frequent self-reported reasons for missed dental appointments were that they had “Forgotten to attend” and were “Afraid of the dentist” (Fig. 1).

Dental anxiety and beliefs of the dentist. The mean DFS and DBS sum-scores were 53.3 (22.9) and 40.0 (11.7) respectively, with no differences between groups. Females had a higher mean DFS sum-score than males (57.3 versus 47.0), but the difference was not statistically significant.

Painful experiences. Forty-one percent of the participants reported the last dental appointment was painful (12/29) with no differences between groups.

Response Cards (RC). On the basis of ‘Previous experiences’, the following cards were given the highest priority:
- “To sit in the dental chair is frightening” (5 females and 2 males);
- “Dental treatment is too painful” (4 females and 2 males);

Pros and cons. The cards most frequently given the highest priority in this group were:
- “I would like my teeth to look nicer” (7 females and 5 males);
- “I would like not to get toothache or any pain in my mouth” (5 females and 2 males);
- “I would like to have the feeling of coping during treatment and not to be worried about unpleasant feelings in my body” (3 females and 3 males).

Preferences. The most frequent cards given first priority were:
- “I would like the dentist to stop the treatment as soon as I give a signal” (4 females and 3 males);
- “I would like to have a nice and trustful dentist” (9 females and 2 males);
- “I would like to take medicine that makes me more relaxed before and during treatment” (5 females and 3 males).

Interview. No respondents refused to be contacted by phone, and the overall impression was that the subjects were positive when they were contacted. The experimental groups had more positive perceptions concerning the following statement: “I think the interviewer liked to talk to me” (WAI-item 3) compared with subjects in the control group (p<0.05). All the subjects that received the RC (groups I and III) supported the idea of sending the cards to the dental clinics.

Credibility and cognitions. The mean sum-scores of C and WAI were 33.4 (SD±7.4) and 36.4 (SD±13.6), respectively. The correlation between C-scores and WAI-scores was r=-0.563, p<0.05. The comparison of C and WAI-sum-scores between groups is shown in Table 2. Subjects in the experimental groups (I, II and III) had significantly higher scores (more positive) on C-item 5, “How much easier do you perceive dental
treatment to be for you, based on this program?”, compared with the control group, 3.0 versus 6.0 (p<0.05). Females had higher C-scores by comparison with males (35.1 versus 29.5), but the differences were not statistically significant. Subjects in the experimental groups had lower scores on WAI-item 3 (more positive beliefs), “I think the interviewer liked to talk to me”, 2.4 versus 3.8 (p<0.05). Subjects with high dental anxiety (DFS>59) had significantly higher WAI-sum-scores (more negative beliefs) compared with subjects with moderate/low score, 43.6 versus 30.7 (p<0.05).

Discussion

The main purpose of this pilot study was to test the methodology to be used in a planned intervention study in a larger sample of adolescents with non-attendance behaviour. The present study has identified important aspects that have to be addressed in the planning of an intervention. Even if the sample was small, the subjects in the experimental groups had significantly higher ratings of credibility (the program would make dental treatment easier for them in the future) compared with the control group. Previous research has shown that credibility is a good predictor of treatment outcome [Ost et al., 1998], and the pilot results verified our main hypothesis, namely that subjects in the experimental groups would report higher credibility related to the program than controls. The high frequency of response card choices themselves was interesting and instructive. Dental clinics could begin to learn from these comments and modify standard dental treatment so as to better meet the needs of avoidant adolescents. For example, dental clinics could make it a priority to focus on aesthetic needs, provide signal mechanisms, and use appropriate analgesia and sedative agents.

The sample size was probably too small to give statistically significant differences between the different experimental groups. All three interventions communicated to the subjects that the dental personnel were concerned and that their individuality was recognized. Feedback and advice were offered within the context of acknowledging the client’s right to choose, in contrast to the straightforward advice-giving approach that they usually experience (control group), and that can inadvertently result in reactance and defensiveness. All the subjects receiving the RC (groups I and III) supported the idea of sending the cards to the dental clinics, and thereby giving the dental personnel the opportunity to adjust future dental treatment procedures individually, based on the selected priority of cards. The RC instrument should represent an intervention with minimal professional administration and costs for the public dental service.

The overall impression was that the MI approach was somewhat surprising to the subjects interviewed, and this makes sense based on the MI theory where feedback and advice are offered, within the context, however, of acknowledging the patient/client’s right to choose. This approach probably represents a new experience, in contrast to the more direct persuasive style with which they might be familiar.

The low response rate is a concern. A lot of effort was needed to recruit the participants, and the effect of the offered incentive was lower than expected. The adolescents were encouraged during the interview to return the last questionnaire (only 2 pages) and thereby receive the incentive, but very few responded initially. After several weeks, however, 78% of them had completed and returned the post-intervention questionnaire and received the incentive, giving a final response rate in accordance with previous studies in the same population [Skaret et al., 1999]. However, a low initial response rate for questionnaires sent to subjects with avoidance behaviour is reasonable, and the present results indicate that specific efforts will be needed to reach a sufficient rate. These results will help sample size calculations for future intervention studies.

The ineffectiveness of marketing programs offering reduced costs for clinical dental examinations for young adults has been experienced earlier (unpublished data in Norway). Given the initial low response rate, an important issue may be how to capture the attention of the adolescents. Mail marketing tactics or lottery announcements, where higher incentives (more money) are drawn by random among a few respondents, may be more effective than sharing the total amount equally.

The criteria for including subjects in a group with ‘high-risk behaviour’ (dropout) should be very specific. The interviews revealed that lack of communication (e.g. new address) may recruit subjects to these ‘high-risk’ lists based on false criteria. In this way missed appointments (once or more than once) may not represent any risky behaviour in themselves. The present results may indicate that the sample should include younger age groups (16 year olds). The advantage would be a more stable sample where the subjects are still, to some extent, influenced by their parents. In that case a parents’ consent would probably be required. For future intervention studies with a longitudinal design, strict inclusion criteria for the ‘high-risk behaviour’
(dropout) group will be important, as change in behaviour is one of the outcome measures.

Mean scores of both dental anxiety and beliefs of the dentist were higher than the normative scores in this population [Skaret et al., 1998]. The results of the present study thereby confirm previous studies showing that adolescents with non-attendance behaviour have higher dental anxiety and more negative dental beliefs compared with the normative scores in this population [Skaret et al., 1998a, b]. The reported reasons for non-attendance were according to previous studies in the same population, showing that forgetting the appointment and dental anxiety are important factors related to non-attendance behaviour in this age group [Skaret et al., 1999].

Conclusion

Overall, this pilot study has provided important information for this kind of intervention study in the future. A questionnaire sent to non-attending adolescents and followed by a brief telephone call appears to be a credible intervention. The opportunity for adolescents to present their point of view and the flexibility of dental providers to entertain individual differences may lead to a willingness of adolescents to attend dental clinics. Moreover, while differences were small, motivational interviewing techniques utilized in a brief telephone call may enhance the above effect. A future longitudinal study with a bigger sample, and with change in behaviour as an endpoint measure, is planned based on the present pilot results.

References


