

**CAN PSYCHOLOGICAL MODELS BRIDGE THE GAP BETWEEN CLINICAL
GUIDELINES AND CLINICIANS' BEHAVIOUR? A RANDOMISED
CONTROLLED TRIAL OF AN INTERVENTION TO INFLUENCE DENTISTS'
INTENTION TO IMPLEMENT EVIDENCE-BASED PRACTICE.**

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Abstract

Objective: The lag between publication of evidence for clinical practice and implementation by clinicians may be decades. Research using psychological models demonstrates that changing intention is very important in changing behaviour. This study examined an intervention (rehearsing alternative actions) to change dentists' intention to implement evidence-based practice (EBP) for third molar (TM) management (EBP is weighted against TM extraction).

Design. Randomised controlled trial / Postal.

Setting: Community

Subjects and Methods: Dentists were randomly selected (from the Scottish Dental Practice Board Register), allocated to Intervention or Control groups, and sent a questionnaire. The Intervention group listed management alternatives to TM extraction prior to their TM extraction intention, and the Control Group did not. Based on psychological models for reducing a behaviour's frequency, prior listing of alternatives should decrease extraction intention.

Main outcome measure: Intention to extract TMs.

Results: 99 dentists - 70 Males, 29 Females; mean age = 41.42 years (SD = 8.62). The Intervention group had significantly less intention to extract than the Control ($t(1,97) = 2.79, p = .006$), despite similar knowledge of management alternatives ($t(1,61) = -1.49, p = .142$).

Conclusion: Results suggest this intervention, which successfully influenced a proximal predictor of behaviour pertinent to dental EBP, would result in improved EBP. Basing implementation interventions and trial methodology on psychological models may effectively bridge the gap between clinical guidelines and practice.

Introduction

Variation in clinical practice is an important source of variance in health outcomes¹. The purpose of clinical guidelines is to improve patient outcomes by limiting inappropriate variation by outlining evidence-based practice (EBP).²⁻³ This evidence-based approach to care will have an increasing impact on everyday dental practice as more guidelines are introduced. However, it is well-documented (and lamented) that the publication of evidence relating to clinical practice, either as individual studies or as guidelines, does not automatically result in implementation by clinicians.⁴⁻⁵ The lag between the provision of evidence and its implementation by clinicians may be decades.

Interventions to facilitate the implementation of EBP have had limited success.⁶⁻⁸ Implementation interventions tend to be aimed at increasing knowledge or skills and include approaches involving the dissemination of educational materials, small group education, or audit and feedback. However, systematic reviews of such interventions have shown that increasing knowledge and skills is usually insufficient to achieve changes in clinical behaviour.⁹⁻¹⁰ Yet, expensive implementation interventions continue to be developed and trialled using this unsuccessful paradigm. There is a need both for more effective methods of designing implementation interventions and for more efficient trial methods.

Although implementing guidelines often require clinicians to change their behaviour, there is little evidence that psychological models of behaviour change have been applied to the design of implementation interventions. Yet, these models have been successfully used to predict variation in many different behaviours in many different populations.¹¹⁻¹² They provide a framework showing relationships between psychological variables, such as beliefs, attitudes and intentions, and behaviour. These models have also been used to design interventions which have been successful in

changing behaviour.¹³ One aim of this study was to explore the feasibility of applying psychological models to the design of interventions relating to the implementation of EBP, which has yet to be determined.

In addition to enlightening the design of implementation interventions, psychological models may also inform implementation trial methodology. Currently the main means of testing the success of implementation interventions in different populations is in resource intensive full trials. Psychological theories model relationships between cognitive variables and behaviour. They therefore identify variables which are proximal predictors of behaviour. Thus, the likelihood of a successful trial may be considerably increased by first examining the effect of interventions on a proximal predictor of behaviour in a modelling experiment. It is reasonable to expect that an intervention which influences a proxy outcome will be more likely to influence behaviour in a full trial than an intervention which does not.

An example of a proximal predictor of behaviour is Intention. While not everyone who intends to perform a behaviour will do so, research using psychological models (particularly the Theory of Planned Behaviour) provides ample evidence that intention to perform a behaviour is nevertheless one of the best predictors of actually performing it.¹⁴⁻¹⁵ It would be expected that an implementation intervention which successfully influences behavioural intention in a modelling experiment would be more likely to change evidence-based practice in a full trial than one which did not.

The Scottish Intercollegiate Guidelines Network (SIGN) has recently published evidence-based guidelines relating to the care and management of third molars.¹⁶ The guideline evidence supports the overall reduction of third molar extractions. An implementation intervention relating to the management of third molars would therefore be required to reduce this behaviour. Based on the psychology literature, the likelihood

of a successful implementation trial would be increased if it employs an intervention which reduces dentists' intention to perform third molar extractions.

Research using psychological models provides guidance on designing an intention-behaviour intervention. Gollwitzer, Orbell, Sheeran and their colleagues have demonstrated that the likelihood of performing a behaviour can be increased by planning when you intend to perform it.¹⁷⁻¹⁹ Behavioural approaches point to the need to develop alternative behaviours as the most effective method of eliminating a behaviour.²⁰ We therefore sought to reduce dentists' intention to extract third molars by having them plan alternative behaviours to extracting third molars.

Method

This was a randomised controlled trial. Following postal distribution of guidelines on the management of third molars, a sample of 205 dentists were randomly selected from the Scottish Dental Practice Board Register, then randomly allocated to a control or intervention group. Each group was mailed a questionnaire which asked the dentists to describe their background (post-graduate qualifications; number of years they have been in clinical practice) and their third molar-related experience (number of third molar patients seen in the previous year; number of third molar extractions personally performed in this period). All participants were also asked to complete a 17 item general knowledge quiz, derived from the evidence outlined in the third molar guidelines (e.g. An asymptomatic third molar should not be removed when it is buried and in close relationship with the inferior dental nerve: True / False / Not sure). Although background, third molar experience and general knowledge was not expected to be influenced by the intervention, the information was collected to establish if any group differences at baseline existed in these variables, which may possibly influence third molar management or the effectiveness of the intervention.

The main outcome measure was Intention to extract third molars. This was measured with 3 questionnaire items. Two items were concerned with the dentists' intention to personally extract third molars: "Of all the patients you see in the next month who require a third molar extraction, approximately how many do you intend to perform?" answered on a 4-point scale (none/some/most/all); How likely is it that you will extract a third molar within the next month answered on a 7-point scale (Unlikely/Likely); and one item concerned with following the SIGN guidelines (which support doing less third molar extractions): "Do you intend to follow the third molar guidelines?" answered on a 7-point scale (Do/Do not). Answers were summed to create a single intention total with higher scores reflecting greater intention to extract third molars.

Intervention

The intervention involved asking participants to develop an alternative behaviour plan using an open question: "If a patient reports to you with third-molar related pain and swelling, what alternative treatments to extraction would you consider?" Participants allocated to the Intervention Group were sent a questionnaire which asked this item **prior** to the intention items. According to the psychology models, this would have the affect of bringing to mind possible methods of treating third molar problems other than extraction, before the formulation of an intention to extract.

In order to ascertain that groups were equivalent in their specific knowledge (i.e. management alternatives to third molar extraction), a random sample of participants in the Control Group were sent a questionnaire which put this item after the intention items and the rest of the Control Group were sent a questionnaire which did not have this item at all (subgroups A and B, respectively). The questionnaires for participants in all groups were identical except for the placement of this single item.

Results

Participants

99 dentists agreed to participate in the study by returning the questionnaires: 70 males and 29 females, with Mean age = 41.42 years (SD = 8.62 years). 20% of participants had been qualified less than 16 years, 37% had been qualified between 16 and 24 years, and 23% had been qualified over 25 years. 19% of participants had a post-graduate qualification. Participants saw, on average, 19 third molar patients in the previous year, and personally performed 12 third molar extractions in this period. The mean score on the general third molar knowledge questionnaire was 65%. For the intervention item, the mean number of treatment alternatives to third molar extraction was 3.

Equivalence of Groups

There were no significant differences (at $p < .05$) between the Control Subgroups in any variable (return rate, background, independent or dependent) and so the subgroups were combined into a single Control Group for all reported analyses. There was no significant difference in number of returned questionnaires by group (proportion returned: Intervention Group = .485, Control Group = .481; $z = .054$ i.e. < 1.96). There were no significant differences between the Intervention and Control Groups in any background variable (age: $t(1, 89) = 1.63$, $p = .11$; gender: $\chi^2(1, 98) = 2.38$, $p = .30$; years qualified: $t(1, 96) = 1.13$, $p = .26$), third molar-related experience (patients seen: $t(1, 88) = -0.06$, $p = .95$; extractions performed: $t(1, 87) = -0.29$, $p = .77$), general third molar-related knowledge ($t(1, 97) = -1.06$, $p = .29$), or in the number of alternative treatments listed ($t(1, 61) = -1.49$, $p = .15$). Figure 1 depicts the alternative behaviours listed by group.

Place Figure 1 here

Effect of the Intervention on Intention

There was a significant difference between the groups in their Intention to extract third molars ($t(1, 97) = 2.79$, $p = .006$). Dentists in the Intervention Group had

significantly lower intention to extract third molars than the Control Group. Figure 2 illustrates.

Place Figure 2 here

Discussion

Research using psychological models provides evidence which suggests that intention to perform a behaviour is the most reliable predictor of implementing that behaviour. Guideline implementation interventions which do not influence intention to implement EBP are therefore unlikely to influence clinical practice. In this trial we used psychological models to develop an intervention, which successfully changed the intention of dentists to implement third molar EBP in the desired direction. As predicted by behavioural models, planning for alternative behaviours had the effect of reducing intention to perform a behaviour incompatible with EBP.

It should be particularly noted that our intention intervention did not add information, unlike other guideline implementation interventions. All participants had received the guidelines before taking part in the study. Participants in the Intervention and the Control groups were able to demonstrate an equal amount of general knowledge relating to EBP outlined in the third molar guidelines. They were also equally familiar with specific knowledge relating to the possible clinical alternatives to extraction. It was therefore not the existence of guidelines nor level of knowledge which caused a change in clinician's intention to implement EBP. This finding may help to explain the general lag in the implementation of EBP and the lack of success of implementation interventions based on educational approaches. Information and knowledge per se are just not enough to motivate EBP.

This study examined the success of this implementation intervention in the form of modelling experiment, rather than in a resource intensive major trial. Although less than would be expected for a face-to-face interview, the response rate of 48 percent was higher for this one-off postal study than the usual response rate for postal surveys (30

percent or less).²¹ There was also no significant difference in the return rate between the Intervention and Control groups. There is therefore no reason to believe that the response rate biased the result. The evidence suggests that a similar intervention in a full trial may effect improved implementation of EBP.

Conclusion

The results of this study complements and extends current findings on implementation interventions by suggesting that intention can be used as a proxy outcome for dental behaviour, worth investigating prior to full trials. This study also demonstrates the effectiveness of a theoretically based implementation intervention.

Applying psychological models to the implementation of dental EBP does not mean ignoring the necessity of educating clinicians in prerequisite knowledge or skills. However, there is ample evidence showing that information transfer is simply not enough to implement changes in clinicians' behaviour. We therefore need to take advantage of research using models specifically directed at behaviour change.

Psychological models of behaviour change offer a means of identifying possible target variables, both dependent and independent, in designing guideline implementation interventions. Designing interventions based on theoretical models also means that the methodology relating to the intervention design can be replicated. However, using psychological models requires a paradigm shift in guideline implementation studies. The implementation of EBP needs to be conceptualised as behaviour, rather than as ignorance or negligence. Basing guideline implementation interventions on psychological models may be an effective way to bridge the gap between clinical guidelines and clinicians' behaviour.

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Figure 1. Number and type of alternative behaviours to third molar extraction listed by the Intervention and Control Groups.

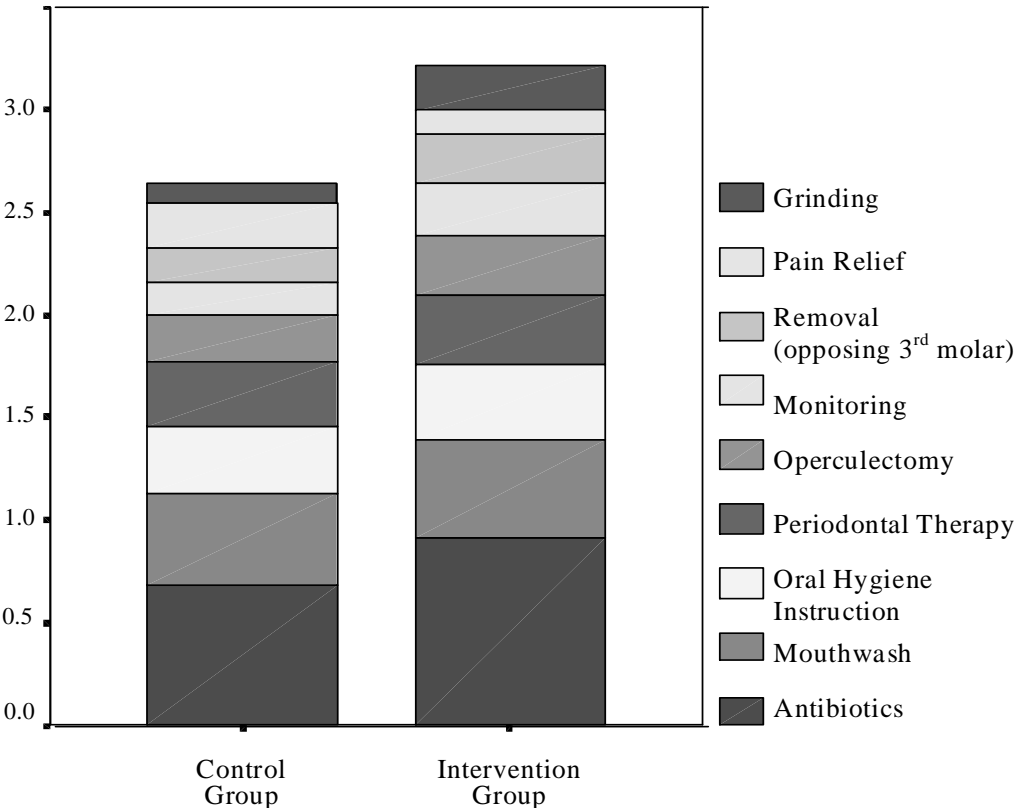


Figure 2. Comparing the Intervention Group and the Control Group on their Intention to extract third molars.

