



Motivational Interviewing for Prevention of Early Childhood Caries

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Early childhood caries is prevalent disease worldwide involving 1.76 billion children even though it is preventable with proper measures. Early childhood caries not only cause local discomfort but also hampers overall growth and development of child. Early childhood caries requires invasive treatments as it progress to later stages so early intervention is helpful to prevent these invasive procedures like restoration and extraction. Various procedures such as fluoride application, oral hygiene maintenance, motivational interviewing, diet counselling, oral health education programs are used for prevention, among them motivational interviewing is the emerging modality for prevention. Motivational interviewing is client centred counselling approach which elicits the behavior change by helping clients to explore and resolve ambivalence. It was first introduced for treating alcoholism now it is implemented in various fields for management of disease such as diabetes mellitus, cardiovascular diseases, reducing sexual behavior and pain management. In

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some of the researches it is found that the preventive measures accompanied with motivational interviewing are more effective than the conventional health education and intervention. Though there are many researches are present on the motivational interviewing in prevention of early childhood caries, better designed and reported interventions are still needed.

Keywords: *Motivational interviewing (MI); early childhood caries (ECC); preventive dentistry; behavioural counselling.*

1. INTRODUCTION

1.1 Early Childhood Caries

In last five decades dental health problems are increasing gradually in India, mainly dental caries [1]. Early childhood caries is one of the most common diseases involving 1.76 billion children worldwide affecting primary teeth [2] Early childhood caries (ECC) is a preventable disease defined as the “presence of one or more decayed (nonactivated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six.” [3] main reason for initiation and progression of ECC is inappropriate nursing practices . It mainly affects maxillary primary anteriors followed by primary molars. Mandibular incisors are generally spared due to protective nature of tongue as it protects these teeth from caries [4,5]. Baby bottle caries, baby bottle tooth decay, nursing caries, and rampant caries are all terms used to describe dental caries in new born and toddlers. In extreme instances, the names ECC and S-ECC are becoming more often employed [4]. The term nursing bottle mouth was introduced by Fass in order to describe the pattern of caries[6] ECC shows multifactorial aetiology, among them cariogenic microorganisms stands first *Streptococcus Mutans*, it is the main culprit for ECC followed by poor dietary and feeding habits and low socioeconomic status. Mutans streptococci in children, are commonly acquired from their mother as it shows increased levels of oral *Streptococcus Mutans*[7–9] Repeated exposure of fermented carbohydrates lowers the pH, and high numbers of cariogenic microorganisms are also associated with carbohydrate intake. These microorganisms produce abundant acid, which lowers plaque pH in the long run and weakens baby teeth. This is because these microbiological studies used bacterial samples collected from a very small number of subjects [9,10]. Along with this ,it is found that breast feeding practice over an year could lead to ECC .Although association of breast feeding as an aetiology to ECC is still controversial. The initial stage of ECC it is

presents as dull white or brown spots on maxillary incisors along the gingival margin, which progresses to a complete destruction of the crown and root stump [11,12]. It is often found that ECC is linked to a variety of general and oral health issues such as local discomfort due to pain, decrease in vertical dimension due to destruction of tooth structure which leads to problems like reduced vertical dimension, masticatory insufficiency, aesthetics, development of parafunctional habits like tongue thrusting and psychological problems, difficulty in mastication which causes nutritional deficiency in child which hampers overall growth and development [11]. It is found that for the treatment of ECC extensive restorative procedures and extractions are required at an early age which are often expensive [12].

2. MOTIVATIONAL INTERVIEWING

Miller and Rollnick [13] first described the motivational interview in 1983, which was developed gradually from the experience of treating alcoholism and substance abuse disorder. MI is defined as “client-centred directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence.” [13] As a therapeutic style, MI provides an approach for interacting with the client so as to utilize their own-expertise to facilitate the change rather than teaching clients skills. On this matter, motivational interviewing is not a free-standing therapy aimed at changing behaviour, instead it makes individual ready for a change by enhancing contemplation and commitment to change in order to use it in conjunction with other therapies to elevate the motivation to change [14]. MI incorporate supportive as well as empathic counselling style in which clients are deliberately redirected towards changing passive behaviour . MI emphasizes the importance of establishing a cooperative relationship and ensuring client’s autonomy to change. In fact, Miller (2000) argues that these elements of MI are very important to the transformation process because they allow love to be expressed in the form of unconditional positive regard and

understanding. Therapists gain change by motivating client by using their own goals and values. The context of the working alliance between the client and the counsellor known as the “MI Spirit” which is the foundation of MI. This concept states that MI spirit should be collaborative rather than autocratic, extracts the client’s own motivation rather than trying to impose, and should respect client’s autonomy. Along with the spirit, MI is also based on some principles. Major principles include showing empathy, developing awareness about the deviation of current behaviour from the important goals or values, circumventing resistance, and promoting self-efficacy for change. Some of characteristic of MI is the use of open questions, reflective listening in order to express empathy, and emphasis on patient autonomy in a clinical session [15]. Miller in 1983 first described [12] the original application of MI was in addiction treatment programs and subsequently studies have demonstrated good clinical results [16] MI has recently been recognizes as an effective intervention in physical health care settings.

Practitioner have acquired some sequence of stages for providing training on MI based on their experience and some research. They are:

- (1) openness to collaboration with clients’ own expertise
- (2) proficiency in client-centred counselling, including accurate empathy
- (3) recognition of key aspects of client speech that guide the practice of MI

- (4) eliciting and strengthening client change talk
- (5) rolling with resistance
- (6) negotiating change plans
- (7) consolidating client commitment
- (8) switching flexibly between MI and other intervention styles [15]

3. REVIEW OF LITERATURE

In one of the randomised control trial conducted in 2018 by Beatriz Carriconde Colvara et al on Motivational Interviewing in Preventing Early Childhood Caries in Primary Healthcare it was found that the intervention done using motivational interviewing was more effective in reducing number of surface compared with the conventional oral health education intervention [18].

In a systematic review and metaanalysis conducted by Reyhaneh Faghihian , Elham Faghihian et al in 2020 on impact of motivational interviewing on early childhood cariesn it was found that the motivational interviewing is as effective as dental health education in controlling early childhood caries [3].

In another study conducted by Weinstein et al. [2004; 2006], [19] comparison between Motivational interviewing and health education of the mother was conducted. In this RCT the application of fluoride varnish was done and results were evaluated after one and two years and it is found that the MI group had less carious involvement than the control group due to higher

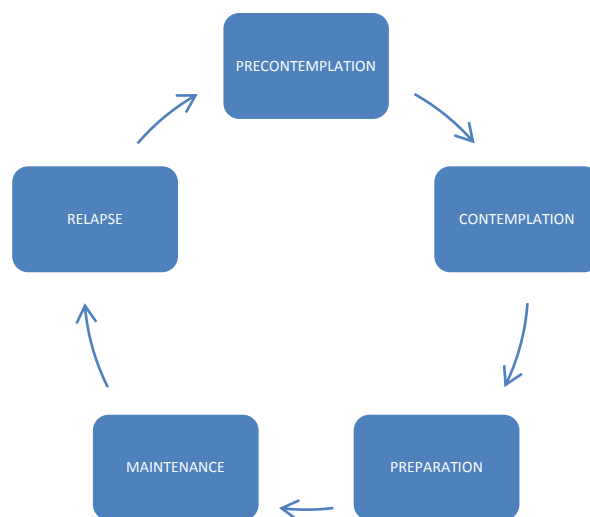


Fig. 1. Stages of MI [17]

compliance of families receiving MI. Though there are many researches are present on the motivational interviewing in prevention of ECC, better designed and reported interventions are still needed.

4. APPLICATION AND EFFECTIVENESS OF MOTIVATIONAL INTERVIEWING

In some recent metanalysis it is found that the motivational interviewing is equivalent or the better treatment than pharmacotherapy, cognitive behavioural therapy and even better than the placebo and nontreatment controls for decreasing use of drugs and alcohol in adults [20–22]. It is found to be effective in various ways. It improves the adherence of the patient towards the management of diseases such as diabetes management, cardiovascular diseases ,in tobacco cessation, reducing sexual risk behaviour, pain management, [17] management of SNAP (smoking, nutrition ,alcohol, physical activity [17]. In one of the study conducted by Beatriz Carriconde Colvara it is found that preventive procedures which were based on MI were beneficial in preventing and may be advocated as part of preventive strategies, particularly in populations with a high illness burden [18]. While applying MI in general practice, practitioners encounter some barriers due to limitation of time given by the patients, the professional development required in order to master MI, when practitioners play the role of expert, it might be difficult to adopt the spirit of MI. Along with this MI therapy has been used in dental practices too for prevention of ECC. It is seen that parents and caregivers has major role in etiology. They contribute to etiology through improper habits of snacking, weaning, breastfeeding and brushing technique. If mother or caregiver is well-informed and made aware of these aspects, they will be able to employ preventive measures at the appropriate moment. Hence intervention at parenteral level can bring change in caries pattern in children.

5. OTHER METHODS FOR PREVENTING EARLY CHILDHOOD CARIES

According to recently published article prevention of ECC can be done at indivual, professional and community level [23].

6. MULTILEVEL APPROACH FOR PREVENTION OF ECC

The most efficient method for treating ECC is to avoid it rather than to cure it using epidemiological data [24].

6.1 Individual Level

Diet plays an important role in maintenance of oral health by maintaining balance diet and good dietary habits improvise oral health and reduce cariogenic activity. Sweetening agents plays an important role in initiation and development of ECC .These sugar products leads to decrease in pH level and leads to demineralization of tooth surface [25]. Bed time consumption of cariogenic food affects the clearing action of saliva [26]. To prevent this, role of dentist , general physician and nutritionist is important to educate and motivate the individual at risk and also put an end to unhealthy habits such as consumption of cariogenic food. Use of fluoridated toothpaste and fluoride varnish has shown a significant reduction in DMFT index. Fluoride protects the teeth from their eruption and even during their development over time [27]. It is seen that annual application of fluoride varnish shows a gradual decrease in demineralisation of enamel surface [28]. Due to constant change in caries process, fluoride found to be effective in bringing change by remineralisation of tooth surface [29].

6.2 Professional Level

Professional level of intervention involves sealant application, diet counselling and fluoride application. The effectiveness of dental sealant is seen in prevention of dental caries in both primary and permanent teeth. It is found that the placement of sealant over arrested caries has stopped progression of caries. It shows some beneficial effect in prevention of ECC [30] as sealant application could leads to decrease in caries incidence up to 50% [31]. Diet counselling is also an effective means of preventing ECC. It has been proven since many decades now that especially sucrose and fermentable carbohydrates increases the cariogenic activity. Making people aware regarding pathophysiology of ECC is very necessary in prevention. Patient need to know the etiological factors behind initiation and progression of ECC to prevent themselves to getting affected by those factors [32]. The purpose of diet counselling is to maintain oral health from caries, as it help parents to change their perception so they can rightly choose a diet which has low carcinogenicity [33].

6.3 Community Level

One of the measures for prevention at community level is water fluoridation. It is the

Table 1. Practitioner duty within the stages of change model [17]

Stages of MI	Practitioner duty
Precontemplation	Gather history and look for any discrepancies between members goals and patient’s life style choices. Provide them harm reduction strategies.
Contemplation	Map out the positive and negative aspect of change in the patients. Gently nudge the patient to balance in the direction of change by reflecting back what they have told you.
Preparation	Asses the patient commitment and provide them with choices for taking steps forward toward the change.
Maintenance Relapse	Help the patient with the strategies for preventing relapse. It prevents demoralization of the patient as it renews the contemplation process.

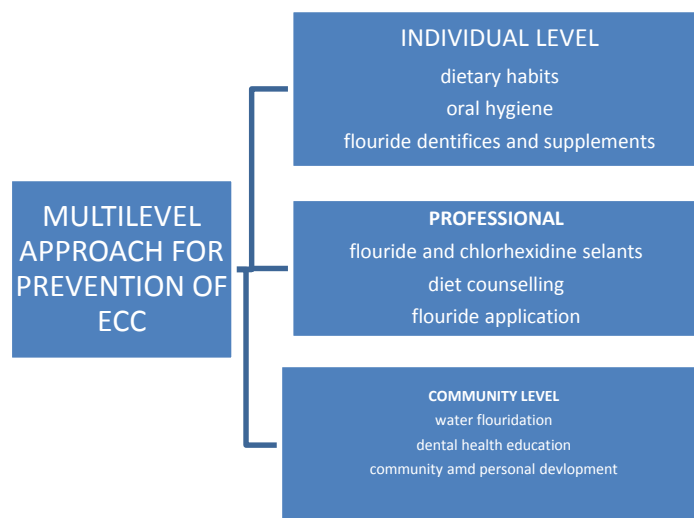


Fig. 2. Individual, professional and community level for Prevention of ECC

only method of prevention that doesn't require any professional and parenteral monitoring [34]. Fluoridation of community water has been shown safe, cost effective and helpful in all phases of life for each and every individual regardless of any demographic differences [31–35]. Fluoridation of drinking water fosters a healthy environment by minimizing oral health problems [35,36]. Water fluoridation, a community level intervention, continues to be an effective approach for delivering fluoride in many nations, according to report [37,38]. Other method for preventing ECC at community level involves dental health education. Main purpose of education is to improve the knowledge of care givers regarding ECC. This eventually leads to increase selfcare practices like maintenance of oral cavity, food and dietary habits of toddlers leading to prevention of ECC [39,40].

7. CONCLUSION

There are many methods of prevention for ECC like fluoride use, sealant application, diet counselling but motivational interviewing is more effective as it resolves ambivalence that people might have about oral health. Over the years MI has established itself as an evidence base treatment. Its usefulness is reported by many studies as it surpasses traditional counselling technique. It is concluded that, when parents learnt about oral hygiene maintenance and importance of oral health be able to set oral health care objectives for their children, gain confidence and motivation for behaviour change, and formulate action plans.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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