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Oral health counselling in changing schoolchildren's oral hygiene habits: a qualitative study

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Abstract – *Objective:* This study explored oral health counselling concerning changes of oral hygiene habits in 11- to 13-year-old schoolchildren within a theoretical framework of the transtheoretical model and the motivational interview. *Methods:* The follow-up data (2002–2003) formed two sequential parts: the first part comprised 66 counselling sessions in 2002; the second part included 31 counselling sessions in 2003. Thirty-one ($n = 31$) schoolchildren were included in the counselling sessions that were conducted by four dental hygienists. The audiotaped and transcribed data were analysed qualitatively by using content analysis. *Results:* In 2002, nearly every schoolchild needed to establish changes in oral hygiene habits but the assessment of schoolchildren's readiness for change often remained unclear. In 2002, giving normative advice was the most commonly used counselling strategy when addressing the need for change, but dental hygienist-centred change discussion and goal setting were also apparent and were related to the schoolchildren's rarely manifested changes of oral hygiene habits after a follow-up year. *Conclusions:* Our results suggest that the theoretical framework might be useful in constructing and focusing on oral hygiene counselling for schoolchildren that concentrates on the personal dynamics of change. Further qualitative research is called for.

Key words: counselling; dental diseases; motivational interview; oral hygiene habits; schoolchildren; transtheoretical model

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During the past few decades, the prevalence of dental caries has declined in many developed countries. Despite the decreasing trend, caries is still fairly prevalent and is a major public health problem in industrialized societies, affecting 60–90% of schoolchildren and the vast majority of adults (1–3). In Finland, approximately 50% of 12-year olds have at least one DMF surface (4), and almost 50% of those who are caries-free develop cavities before the age of 15 years (5). Dental caries has not yet been eradicated (1, 6), and further efforts are required to improve schoolchildren's oral health.

The common, preventable risk factors of oral health diseases are linked to self-esteem, oral health-related attitudes and behaviours (7–10). Besides healthy food habits, maintaining good oral hygiene and using fluoride toothpaste for regular tooth brushing (twice a day) are essential in preventing dental caries and periodontal diseases (9, 11). It has been shown that a relatively stable pattern of tooth brushing is established during childhood and adolescence (12, 13). According to a recent report, the majority of schoolchildren brushed their teeth as a daily routine. However, there were considerable differences in tooth brushing frequency among children in the countries studied. Finnish schoolchildren were classed as below average in tooth brushing frequency (14). In addition, the use of dental floss is rare among them (15).

The professional preventive methods, which are often curatively oriented, may in practice produce no additional benefit (5). This emphasizes the need for behavioural change where the schoolchildren would be able to assume the responsibility for promoting oral health. The theoretical framework of this counselling study comprised the transtheoretical model of change (16) and the motivational interview (17) (Fig. 1). The purpose of the transtheoretical model is to explain how individuals change their behaviour and describe their readiness for change and their experiences during the process of change. Readiness for change can be understood as individuals' current thoughts, feelings and attitudes regarding their intention to institute changes in oral hygiene habits, also influenced by external factors (18, 19). The stages of change are integrated with different individual-centred counselling strategies of motivational interviewing, which are based on empathetic encouragement and confidential interaction (20). The transtheoretical model identifies five stages of change, each of which conceptualizes a state of readiness for change: precontemplation, contemplation, preparation, action and maintenance. The contents of the stages of change are illustrated in the analytic criteria in Table 1. Progress through these stages is thought to be nonlinear and cyclical: readiness for change may fluctuate over time or from one situation to another (19).

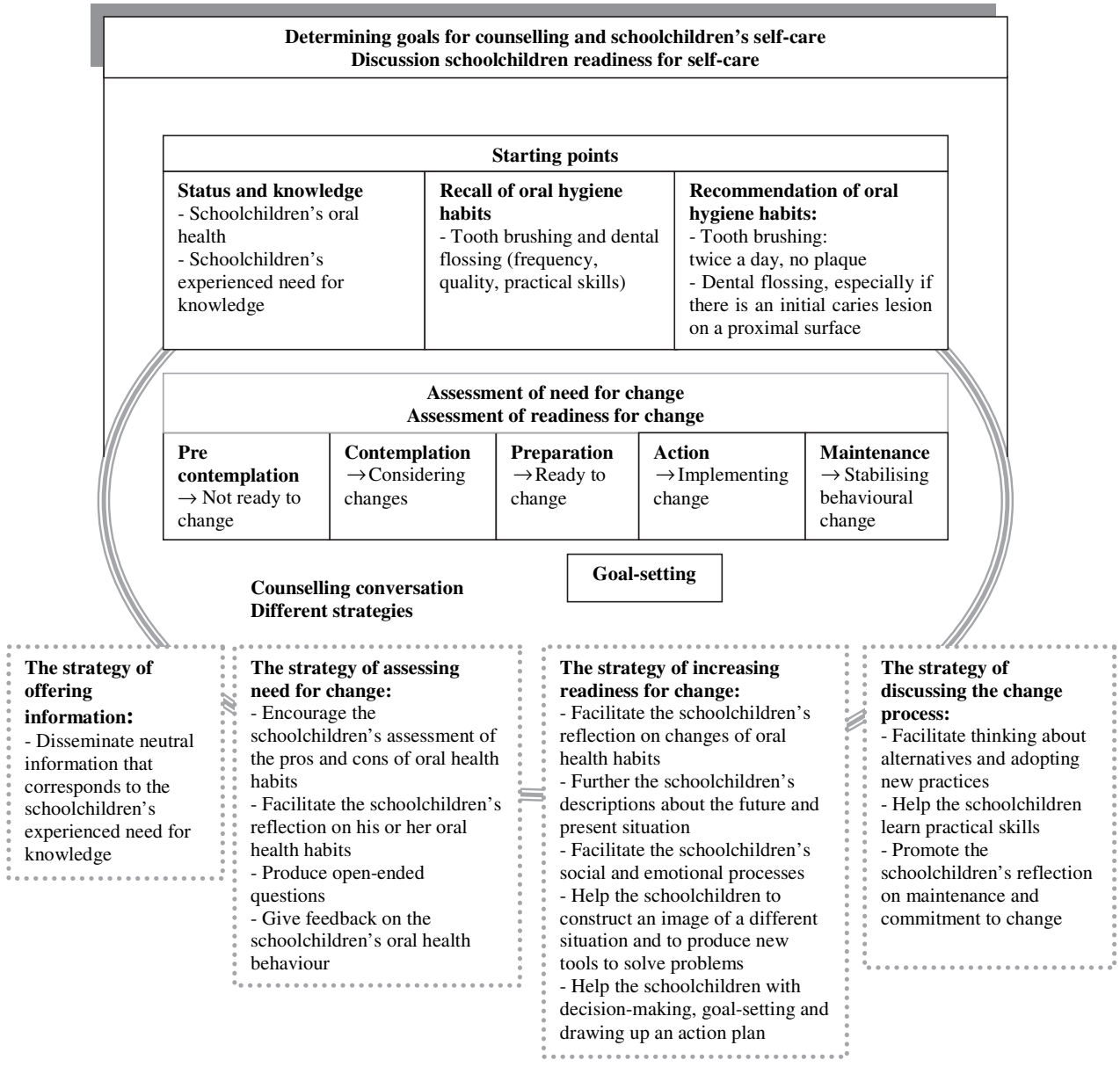

Fig. 1. The construction of schoolchildren's oral health counselling (cf. 18, 19).

Table 1. The analytic outline of discussing readiness for change

The stages of change	Pre-contemplation	Contemplation	Preparation	Action	Maintenance
The analytic criterion that is involved in strategies of motivational interviewing (see Fig. 1)	→ The schoolchild has a need for change according to the recommendations but he or she is unaware of any problems or unwilling to admit them	→ The schoolchild considers his or her need for change and a future change - The schoolchild considers oral hygiene habits and the effects of his or her habits on health - The schoolchild may reflect on barriers to change and have ambivalence regarding change	→ The schoolchild declares his or her intention to make a decision on change or begin a new behaviour in the near future - The schoolchild may reflect on previous experiences and effect tentative changes	→ The schoolchild declares that he/she has effected a change immediately before the counselling sessions - The schoolchild may reflect on his or her own competence and control over the processes of change	→ The schoolchild has no need for change according to the recommendations - The schoolchild may quite thoroughly reflect on his or her own habits and adherence to self-management
	The strategy of assessing the need for change				
		The strategy of increasing the readiness for change			
			The strategy of discussing the change process		

For categorizing the schoolchildren to different stages of change, the major criteria were those related to the states of change (indicated by arrows).

The aim of schoolchildren's oral health counselling within the above-described theoretical framework is to increase individuals' readiness and self-esteem for making decisions, setting goals and effecting changes in oral health habits. The primary goal is to encourage individuals to take responsibility for preventing dental diseases and engage in self-care by practising skills, and providing them with tools to solve problems in implementing the recommended oral hygiene behaviour in real-life contexts (cf. 21–23). When the schoolchildren's counsellors are aware of the signs of readiness for change, and the stage of change, then it is possible to use the most effective, individual-centred counselling strategies at each stage (24). Evidence from the previous studies shows that the intention to brush and floss are related to reported tooth brushing and flossing (25, 26). Furthermore, the purpose of increasing self-esteem is significant because schoolchildren with higher self-esteem are more likely to brush their teeth regularly than those with lower self-esteem (8).

While a great deal of research effort has been invested in the counselling interaction between adults (27), little attention has been paid to that issue in schoolchildren. There are nonbinding recommendations and studies on the frequency and content of oral hygiene instruction in Finnish public oral health care (28, 29). But we do not know how the communication activity of oral hygiene counselling is constructed in practice. Both theoretical models have been applied to a wide range of health behaviours (23, 24, 30, 31) but not to schoolchildren's oral hygiene behaviour. There is the lack of well-defined theory-based models for counselling schoolchildren (32). The aim of this study was to investigate schoolchild–dental hygienist counselling conversations regarding changes of oral hygiene habits within the theoretical framework of the transtheoretical model and the motivational interview.

Methods

Design and data

The data for this follow-up study (2002–2003) were collected as part of a larger research project of schoolchild–dental hygienist communication in public dental care in Finland. Thirty-one 11- to 13-year-old schoolchildren ($n = 31$, 15 girls), diagnosed with at least one initial caries lesion, consented to participate in audiotaped counselling

sessions conducted by four dental hygienists. The follow-up data, which included a total of 97 counselling sessions, formed two sequential parts: in spring 2002, the data comprised 66 counselling sessions and, in spring 2003, the data included 31 counselling sessions. In 2002, the counselling sessions varied from one to four per schoolchild. The schoolchildren's sequential counselling sessions were completed within 1 month, with the exception of one schoolchild whose sessions extended over 6 weeks. In 2003, the schoolchildren assessed their need for change in oral hygiene habits (frequency of tooth brushing and flossing) during counselling conversations. These conversations were conducted during a single session, with the exception of two schoolchildren – one underwent two sessions and the other did not assess his need for change in oral hygiene habits during the sessions in 2003. The ethical committee of the Jyväskylä University accepted the study protocol. Informed consent was obtained from all participating schoolchildren, their guardians and dental hygienists.

Analysis

The data were analysed qualitatively using content analysis (33, 34). At first, all counselling sessions were audiotaped and transcribed verbatim into computer text files and, then, counselling conversations regarding oral hygiene habits within the counselling sessions were identified and recorded in separate text files. The analysis was continued by exploring, in the 2002 data: (i) introduction to counselling, (ii) discussion about assessing the schoolchildren's need for change in oral hygiene habits, (iii) discussion about readiness for change and (iv) counselling strategies which considered changes and new oral hygiene habits. Furthermore, the schoolchildren's changes in oral hygiene habits were explored after a year of follow-up, in 2003. In the data, themes and categories that were centred on particular phrases, turns or types of behaviour regarding the schoolchildren's individual descriptions of their oral hygiene habits and the dental hygienists' counselling practices were identified and indexed. These were coded under the five study aims described above, and were then compared with analytic criteria that were based on the theoretical framework (Table 1). The analysis also included inductively derived categories that identified different counselling practices in the data because the deductively derived categories regarding the practices of counselling strategies were not founded on authentic data (cf. 34). The analysis included both a description of counselling conversations and a datum for every schoolchild concerned. The following transcription symbols are used in the data extracts: SC, schoolchild; DH, dental hygienist; …, omission of text; ( ), researcher's comments.

Results

Analysing the schoolchildren's physical oral health status on the basis of a clinical oral examination was started during the counselling sessions in 2002. In the clinical part, the dental hygienists showed the schoolchildren the initial caries lesion(s) in their own mouths by using a mirror. During the counselling, the dental hygienists provided information to all schoolchildren on the aetiology of oral diseases, oral health care and recommendations. Despite two counselling sessions (schoolchildren nos. 21, 23), the dental hygienists did not encourage the schoolchildren to reveal their own needs, aims, readiness and expectations of oral health self-care, changes and counselling. The dental hygienists usually stated the purpose of counselling and self-management and emphasized the schoolchildren's responsibility for oral health promotion. Such responsibility was not always transferred to practice but, on the contrary, the dental hygienists even brushed some schoolchildren's dirty teeth on their behalf (see Extract 1).

Recall of oral hygiene habits was typically based on the dental hygienists' predetermined questions regarding the regularity and frequency of tooth brushing and flossing. Soliciting the schoolchildren's minimal and intricate responses was difficult and, for instance, the dental hygienists' understanding usually was that the response 'mmm' meant a positive acknowledgement, which did not seem to be the right interpretation in all cases (Extract 1).

Extract 1

In the beginning of the counselling:
DH: …. How's the brushing going?
SC: It's okay
DH: Did you remember to do it every day, morning and evening?
SC: Mmm
DH: You did? That's good, all right
***

The discussion continues during the clinical part of the counselling:

DH: Did you remember to brush your teeth this morning?
SC: Nope (mumbles)
DH: What?
SC: Nope
DH: You didn't. We'll need to brush them a little, then. (The dental hygienist inspects the schoolchild's teeth)
DH: It seems you haven't remembered to brush for a while. When did you brush them last?
SC: A couple of days ago (no. 6)

Nearly every schoolchild (29/31) needed a change in tooth brushing practices. Their needs for change varied in different areas (frequency, quality, practical skills) (Table 2). Comparing schoolchildren's self-reports with the recommendation assessed their need for improving tooth brushing frequency. The schoolchildren were aware of the recommendation. Approximately one half of the schoolchildren needed to revise the quality of tooth brushing because clinical oral examination revealed plaque in their teeth. Seven schoolchildren brushed their teeth twice a day but they needed to improve the results of their tooth brushing. Recall of practical tooth brushing skills concerned 17 schoolchildren. Six children had good brushing results and, therefore, their practical skills were not observed. In some counselling sessions, the schoolchildren's practical tooth brushing skills were not recalled or actually practised although they needed to improve their tooth brushing quality. In practice, the dental hygienists advised and guided nine children in practical tooth brushing skills (systematic execution, position of toothbrush, technique of brushing) (Table 2).

Over two-thirds of the schoolchildren needed to change their dental flossing habits because they had at least one caries lesion in the proximal surfaces and they did not regularly use dental floss (Table 2). In seven cases (7/22), the schoolchildren's practical skills regarding dental flossing were not recalled, although the children had a need for flossing and, in some cases, the schoolchildren reported that dental flossing was very difficult. In a few cases, the children were not willing to practice dental flossing during counselling.

Because the dental hygienists did not encourage the schoolchildren to disclose their readiness for change, determining the schoolchildren's stages of change was occasionally difficult. Only in some sessions did the schoolchildren begin to reflect their intention to make a change (Extract 2).

Extract 2

DH: It would be really good if you'd try to brush your teeth in the morning too
SC: Yeah, this morning I was brushing my teeth
DH: That's it
SC: I guess I have to start
DH: That's right, it would be the easiest way to do it
SC: But it won't take an awful lot of time
DH: Yes, that's right. (no. 13 appeared to be in preparation)

Regarding tooth brushing frequency, 11 schoolchildren were found to be in preparation on the grounds of how they responded to the dental hygienists' questions. In seven cases, the schoolchildren's stages of change remained unclear (Table 3). Seven schoolchildren appeared to be in preparation for changes in dental flossing. Fourteen schoolchildren's readiness for change remained unclear. Readiness for change regarding tooth-brushing quality was discussed during three schoolchildren's sessions.

Contrary to the strategies of the motivational interview, giving advice was the most often used strategy in oral hygiene change counselling in this study (Table 3). Nearly every counselling session included the dental hygienists' exhortations and advice regarding the regularity of tooth brushing and flossing according to the recommendations and statements on paying attention to the quality and systematic technique of tooth brushing. The dental hygienist-centred, question–answer modelled goals for tooth brushing frequency were set during eight schoolchildren's (nos 4, 7, 16, 17, 18, 20, 21, 23) counselling sessions (Table 3). Goals for tooth brushing quality and dental flossing were rarely set during the sessions. Discussion about the change process regarding tooth brushing frequency was a part of counselling sessions and was typically based on dental hygienists' questions and the schoolchildren's minimal responses. The discussion rarely extended to considering mnemonics for tooth brushing and reflecting the significance of teeth (Table 3).

To conclude the analysis, the schoolchildren's changes in oral hygiene habits (frequency of tooth

Table 2. The assessment of schoolchildren's need for change in oral hygiene habits in 2002

Schoolchildren, $n = 31$	Tooth brushing			Dental flossing
	Frequency	Quality	Practical skills	Frequency
Need for change	$n = 18$ Unclear $n = 2$	$n = 16$	$n = 9$ Unclear $n = 8$	$n = 22$ Unclear $n = 2$
No need for change	$n = 11$	$n = 15$	$n = 14$	$n = 7$
Assessment of need for change:	DH: Well, how often do you brush your teeth? SC: Whenever I remember	DH: You should sharpen up your brushing a little.	DH: Do you feel (a toothbrush) against your gum over there? SC: Yeah	DH: You could start practicing this now because of the lesions you have over there now, you know, a lot of gunk is coming out of there I guess
Examples of semantic content in the counselling data	DH: Well, don't you remember to brush everyday yet? SC: Nope DH: You don't? SC: My memory's not good DH: Is that right? I wonder…. Do you know how often you should brush? SC: Every day DH: Um, how many times? SC: Two or three DH: Two's enough (no. 7)	Look at the gum walls… This is where the bacteria live. New cavities will begin to develop here. (No. 13)	DH: All the way in the back? Reaches down pretty well, right. And brush over there so that everything gets brushed next to the palate SC: It's pretty difficult to do that when you're used to just brushing in the front. (no. 20)	SC: Mmm DH: your lunch is in there. You see, you can't get them out with a brush. I meant to say that the lesions, they are between your teeth, over here in the back. (no. 1)

brushing and flossing) were explored after a year of follow-up, in 2003. Four schoolchildren (nos. 17, 18, 21, 23) who appeared to be in preparation in 2002 had made changes in tooth brushing frequency. They had no need for change in this area on the grounds of their assessment in 2003. In this data set, the schoolchildren's changes in tooth brushing frequency were related to two counselling strategies: the discussion about change processes and goal setting (Table 3, see category 1). In addition, six schoolchildren (nos. 3, 9, 16, 18, 21, 23) stated that they had made a positive change in dental flossing habits after 1 year, in 2003. Three schoolchildren (nos. 18, 21, 23) had made changes in both areas of oral hygiene: frequency of tooth brushing and flossing.

Conclusions

The findings of our study revealed, as many previous studies have done (cf. 21, 31, 35, 36), how difficult the practical implementation of counselling can be. Besides planning the content (10), the effective practice of health counselling requires planning of communication activity. The complex nature of the schoolchildren's oral hygiene habits (7) requires detailed, systematic and practical recall of oral hygiene habits (frequency, quality, practical skills) and continuous itemizing of the schoolchildren's minimal and occasionally intricate responses. In this study, the schoolchildren showed that although they brushed their teeth according to the recommendations, their technique was incorrect. Alternatively, the schoolchildren stated that their tooth brushing was correct although it did not conform to the recommendations. Our study exposed, as previous studies have done (12, 13, 37), that it is difficult to change an irregular pattern of tooth brushing to a stable and regular pattern while undergoing the changes of adolescence. Memory problems and the difficulty of finding time were the most commonly reported barriers to brushing teeth twice a day and practising flossing (cf. 37). Behavioural changes require commitment of time and energy and are long-term processes. The schoolchildren's counselling sessions continued even after the sessions reported in this study. Issues of oral hygiene habits may have been reviewed during the subsequent sessions.

In this study, the counselling sessions occasionally consisted of one-sided delivery of information. Individually tailored information (18) is a neces-

Table 3. Change counselling strategies in the area of tooth brushing frequency in 2002. 18 schoolchildren had a need for change in this area

Counselling strategies which were founded on the data		
Determination of strategies	Examples of semantic content in the data	The counselling strategies involved in readiness for change†
1 *Giving advice* by the dental hygienist concerning an area of the schoolchild's need for change and in which appropriate health behaviours were normatively recommended and suggested. 2 *Dental hygienist-centred goal-setting* was the practice in which the aim for action was set, related to the schoolchild's need for change. The schoolchild accepted the aim. 3 *Discussing change* comprised the contents of the strategy of increasing readiness for change and the strategy of discussing the change process (Figure 1). In this data, discussion was dental hygienist centred and included issues of barriers, pros/cons and alternatives of oral hygiene habits and memory rules and significance of teeth.	1: DH: It would be really great if you'd have time to brush in the morning as well, it would be so good for your teeth to clean them twice a day, mornings and evenings (no. 27) 2: DH: I mean, could we now agree on a goal that by the next time you'd try to brush every single morning? SC: Yeah (no. 21) 3: DH: What's so difficult to remember about it (brushing)? What? SC: I don't know DH: What do you think about your teeth, how important are they for you? SC: Not at all. DH: Not at all? What if you'd have no teeth any more? SC: Mmm DH: Of course there's nothing one can do if they're not important to you but still you feel that it's a pretty good idea to have teeth in your mouth for eating and they make speaking a lot easier too. You should think about that a little anyway, maybe you'd need them for something anyway (no. 6)	*Group I* Readiness for change: preparation Eleven schoolchildren were included in this group → Category 1 Strategies: (1) + 2 + 3 Schoolchildren nos. 7, 16, 17*, 18*, 20, 21*, 23* (Strategy 1 did not occur in all cases) → Category 2 Strategies: 1 + 2 Schoolchild no. 4 → Category 3 Strategies: 1 + 3 Schoolchildren nos. 9, 13 → Category 4 Strategy: 1 Schoolchild no. 12 *Group II* Readiness for change: Unclear Seven schoolchildren were included in this group → Category 5 Strategies: 1 + 3 Schoolchildren nos. 3, 6, 8, 10, 27, 31 → Category 6 Strategy: 1 Schoolchild no. 15

*The schoolchild had made changes in tooth brushing frequency during the follow-up year and he or she had no more need for change in this area in 2003.
†Schoolchildren numbered and divided into two groups (I, II) according to their readiness for change and to different categories according to counselling strategies. Arrows indicate the categories.

sary part of counselling. Schoolchildren's health-related knowledge has been shown to have a positive impact on their behaviour (10, 38). However, mere knowledge gain is not enough for producing behaviour change (39). Therefore, oral health counselling should employ a range of strategies (18). In this study, the sessions did not reveal the schoolchildren's needs, aims, and readiness for counselling and change in their oral hygiene habits. In many cases, the assessment of schoolchildren's readiness for change remained unclear although nearly every schoolchild had a need for change in the area of oral hygiene habits. A part of schoolchildren appeared to be in preparation on the grounds of their affirmative response to the dental hygienists' simple questions regarding their intention to change. However, detailed discussion would have disclosed a different description of the schoolchildren's readiness for change. Mutual determination of the goals for counselling and oral hygiene self-care and clarifying individual readiness for change construct the starting points for counselling within the framework of the transtheoretical model and the motivational interview (18, 19). To perceive customers' stages of change and to react to their readiness for change is not an easy task (31). Yet, in individual-centred counselling conversation, it is vital to consider a schoolchild's needs, preferences and the factors that are related to his/her oral health-related behaviour (8, 10, 25, 26) and behaviour change. Activities of reflective

conversation encourage the schoolchild both to accept the oral-health related recommendations and to internalize them as his/her intrinsic behavioural norms.

In this study, giving advice by using recommending and persuasive styles was the most commonly used strategy by the dental hygienists although the evidence for its suitability as the principal strategy for lifestyle change is not strong (cf. 35). Goal setting, which was dental hygienist-centred, appeared quite rarely in this data. Still, goal setting seemed to have an important role in counselling and, besides the strategy of discussing change, it was related to the schoolchildren's changes of tooth brushing frequency. Application of motivational interviewing tended to support the schoolchildren's personal change goals rather than counsellor-based or institutional goals (24). Unfortunately, counselling in public health care has often proved to be superficial and controlled by professionals, who are the most active participants both in presenting the problems and in offering proposals for customers (35, 36). Health professionals tend to elicit information from children but to exclude them in the communication of decision-making, diagnosis and treatment (27). Tates et al. (40) concluded in their doctor–parent–child trial that inviting children to formulate the problem definition embeds the opportunities for child participation in the future course of the counselling (40). Developing schoolchild-centred approach and increasing shared decision-making might lead to a shift in the schoolchild–dental hygienist relationship from being asymmetrical towards more egalitarian. In this study, the principal reason for the dental hygienist-dominated delivery of information and advice could be the tradition of oral hygiene instructions in the context of Finnish oral health care (cf. 41). In the traditional model, it is supposed that the information itself and its delivery influence the individual's behaviour. The strong institutional and recommendative orientation of oral hygiene practice may cause one to view human behaviour as rational and independent and disregard the manifold factors and complications of real life (cf. 19).

Schoolchildren's role in counselling conversation deserves special attention. The fact that the schoolchildren formed a challenging heterogeneous group for counselling should be kept in mind when considering the implications for counselling practices. Schoolchildren have their own ways of participating in the counselling conversation, which can waver between participation and non-participation (36). Furthermore, oral hygiene habits are not an isolated behaviour but a part of the schoolchildren's lifestyle (7). Therefore, the implementation of counselling practices and oral health problems occur in the context of the schoolchildren's critical period of development, including biological, psychological and social processes and their everyday life and socioeconomic differences (1, 24). Attitudes also fulfil this function. In this study, the schoolchildren could avoid deep and meaningful conversation because the dental hygienists adopted a dominating role as professionals with knowledge and advice. Alternatively, they were unaccustomed to participating in a conversation or they felt that the issues were difficult or boring (cf. 28, 36).

A few words of caution are justified. What grounds do we have to claim that this theoretical framework is legitimate for analysing schoolchild–dental hygienist counselling practices? We indicate that the application of the transtheoretical model's stages of change and motivational interviewing to oral health counselling can be useful for manifesting conversational aims and areas of oral health counselling, when flexibly applied, not narrowly categorizing schoolchildren's actual life or counselling practice. The theoretical framework of counselling may broaden counsellors' awareness of readiness for change and foster a schoolchild-centred and much more systematic and efficient approach to counselling and contribute to adapting appropriate counselling strategies in the context of schoolchildren's varied oral hygiene histories and life situations. Discussing readiness for change, goal setting and change processes may be significant components of constructing schoolchild-centred change counselling.

There are limitations to this study because the data were quite restricted and collected in the public dental care setting of a single town and, therefore, its generalizability is limited. In this research, we operationalized the qualitative content of the stages of change and counselling strategies. In addition, we described the progress of detailed analysis in order to confirm the credibility and reliability of this study (cf. 33). The key concept was the potential for the application of the theoretical framework in the context of oral health care. The findings and applications of this study may have implications for primary oral health care practice and for education, as there is an evident need for improving and developing oral health

education to meeting the personal needs of individuals (42).

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