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– The role of dental hygienists and dental nurses

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To Kerttu and Reima

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ABSTRACT

This study explores how to support the oral health and oral self-care of patients, especially patients with periodontitis. First, the current patient education practices of dental hygienists are described: their skills and knowledge related to patient education and the implementation of patient education in their work, with regard to both method and content (I). Then the acceptability of the oral health promotion program based on the transtheoretical model (TTM) is evaluated (II). Next, behavioral and educational interventions used to improve self-care in adult periodontitis patients are evaluated in comparison with conventional instruction (III). Last, the effectiveness of the motivational interview (MI) for the oral health and self-care of patients with periodontitis in comparison with traditional education is determined (IV).

In phase I, dental hygienists (n=222) answered the questionnaire. In phase II, the data were collected by dental hygienists and in-service trained dental nurses (n=28) involved in the health promotion program. In phase III, a systematic review was conducted, and in phase IV, the data were collected among adults with diagnosed periodontitis (n=28) randomly assigned to two groups (MI group and control group).

The main findings are that dental hygienists regard patient education as important, and they seem to have the knowledge and skills for patient education in theory; however, some improvements should be made for patient education to become more effective, more patient-centered and more empowering (I). Dental professionals have a good attitude toward a novel patient education program based on the TTM. Training in new methods seems to increase their motivation to promote oral health, their evidence-based knowledge, and in some, their professional development (II). The behavioral interventions seem to be beneficial for patient adherence and may therefore improve initial periodontal treatment success (III). Patient education based on MI compared with professional-centered education seems to improve the oral health and self-care of patients with periodontitis (IV). As a conclusion: even brief training in the behavioral method for dental professionals can be sufficient. It can make patient education more empowering and, in that way, support the oral health and oral self-care of patients. Professionals' own development in the use of the new method can happen step by step, adapting it naturally to their own practice.

KEYWORDS: patient education, empowering education, transtheoretical model, motivational interviewing, self-care, periodontitis

TURUN YLIOPISTO
Lääketieteellinen tiedekunta, Hammaslääketieteen laitos
Sosiaalihammaslääketiede
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TIIVISTELMÄ

Tutkimuksessa tarkasteltiin miten potilaiden suun terveyttä ja omahoitoa voidaan tukea. Potilasohjauksen nykytilaa kuvattiin selvittämällä suuhygienistien näkemyksiä potilasohjaustiedoistaan ja taidoistaan. Toteutunutta potilasohjausta kuvattiin sisällöllisesti ja menetelmällisesti (I). Seuraavaksi arvioitiin transteoreettiseen muutosvaihemalliin pohjautuvan ohjausmenetelmän hyväksyttävyyttä suuhygienistien ja hammashoitajien keskuudessa (II) sekä potilasohjausinterventioita, joita on toteutettu parodontiittia sairastavien ohjauksessa (III). Lopuksi tutkittiin motivoivaan haastatteluun perustuvan ohjausmenetelmän vaikuttavuutta suun terveyteen ja omahoitoon parodontiittia sairastavilla, asiantuntijalähtöiseen ohjaukseen verrattuna (IV).

Ensimmäinen aineisto kerättiin suuhygienisteiltä (n=222) puolistrukturoidulla kyselyllä. Toisessa vaiheessa aineisto kerättiin suuhygienisteiltä ja hammashoitajilta (n=28), jotka olivat osallistuneet uuden ohjausmenetelmän koulutukseen ja toteuttaneet sitä perheiden ohjauksessa. Kolmannessa vaiheessa toteutettiin systemoitu kirjallisuuskatsaus. Neljännessä vaiheessa tehtiin satunnaistettu kontrolloitu kliininen tutkimus, jossa parodontiittia sairastavat aikuiset (n=28) satunnaistettiin kahteen ryhmään (motivoiva haastattelu ja kontrolliryhmä).

Suuhygienistit kokevat potilasohjauksen tärkeäksi sekä arvioivat taitonsa ja tietonsa hyviksi. Kehitettävää kuitenkin oli ohjauksen potilaslähtöisyydessä ja potilaan voimavaraistumisen tukemisessa (I). Suuhygienistit ja hammashoitajat suhtautuvat myönteisesti uuteen ohjausmenetelmään. He kokivat koulutuksen lisäävän heidän omaa motivaatiotaan, näyttöön perustuvaa tietoaan ja ammattitaitoaan (II). Motivoivaan haastatteluun perustuva potilasohjaus näyttää parantavan potilaiden suun terveyttä ja lisäävän omahoitoa, asiantuntijalähtöiseen ohjaukseen verrattuna (IV). Johtopäätöksenä todetaan, että lyhytkin suun terveydenhoidon ammattilaisille annettu käyttäytymistieteellisten menetelmien koulutus voi lisätä ohjauksen potilaslähtöisyyttä ja sitä kautta tukea potilaan motivaatiota ja omahoitoa. Ammattilaisen oma kehittyminen uuden menetelmän käytössä voi tapahtua vaiheittain, sitä omaan toimintaan luontevasti soveltaen.

AVAINSANAT: potilasohjaus, voimavaraistumista tukeva ohjaus, transteoreettinen muutosvaihemalli, motivoiva haastattelu, omahoito, parodontiitti

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Main concepts

Self-care	The ability of individuals to promote health, prevent disease, maintain health, and to cope with illness and disability with or without the support of a healthcare provider.
Oral self-care	The ability of individuals to promote oral health, prevent oral diseases, maintain oral health and to cope with illness e.g. periodontitis. Properly performed oral self-care requires motivated, skilled individuals with sufficient dexterity, effective cleaning devices, and appropriate oral hygiene instruction from dental professionals.
Patient education	Any combination of learning experiences designed to help individuals improve their health, by increasing their knowledge or influencing their attitude.
Motivation	Motivation is the desire to act in service of a goal. It is the crucial element in setting and attaining one's objectives.
Empowerment	Empowerment means that individuals can identify their needs, resolve their problems and in that way gain control over their own lives.

List of abbreviations

BOP	Bleeding on probing
CAL	Clinical attachment level
DH	Dental hygienists
EEC	Early childhood caries
EPE	Empowering patient education
MI	Motivational interviewing
MS	Mutans streptococci
p	Value for statistical significance
PD	Probing pocket depth
RCT	Randomized clinical trial
TTM	Transtheoretical model

List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I Rantanen M, Johansson K, Honkala E, Leino-Kilpi H, Saarinen M, Salanterä S. 2010. Dental Patient Education: A Survey from the Perspective of Dental Hygienist. International Journal of Dental Hygiene. 8:121–127.

II Arpalahti I, Järvinen M, Suni J, Pienihäkkinen K. 2012. Acceptance of oral health promotion programs by dental hygienists and nurses in the Vantaa public dental service, Finland. International Journal of Dental Hygiene. 10:46–53.

III Järvinen M, Stolt M, Honkala E, Leino-Kilpi H, Pöllänen M. 2018. Behavioural interventions that have the potential to improve self-care in adults with periodontitis: a systematic review. Acta Odontologica Scandinavica 8:612–620.

IV Järvinen M, Valkeapää K, Suominen A, Pöllänen M. 2019. Supporting oral self-care of patients with periodontitis through Motivational Interview – results from an RCT study. Manuscript.

1 Introduction

Almost all dental diseases could be prevented quite easily with proper oral self-care, but nonetheless oral diseases, dental caries and periodontal diseases are the most common health problems among people in industrialized societies (Kassebaum et al. 2014, 2015). Proper oral self-care includes several elements: regular oral hygiene, including tooth brushing and use of a fluoride-containing toothpaste twice a day, healthy eating habits with proper timing and composition of meals, and water as a thirst quencher. Interdental cleaning combined with the above-mentioned steps is essential to prevent periodontal diseases. (Chapple at al. 2015) Therefore, educating and motivating patients to take up the baton of their oral health is an essential intervention in fields of oral health care. It is not only necessary but also prescribed in law: according to the Act on the Status and Rights of Patients, every patient shall be given information about their care so that they can take part in decision-making (FINLEX. 1992). The patient education, oral health promotion and prevention of oral diseases are the main tasks of the dental hygienist. Nowadays, also dental nurses and practical nurses focusing on oral health care are responsible for patient education and health promotion.

Patient education is widely researched in different specialities within oral health care. However, there is only few rigorous studies on patient education interventions for patients with periodontitis. One reason may be that the definition of periodontitis has varied; also, a large range of methods has been used, and meta-analysis of studies has been unfeasible. In any case, previous studies suggest the conclusion that traditional, professional-centered education is not so effective (Renz et al. 2007) and there is a need for effective interventions that can improve adherence to oral self-care (Wilson 1996). Therefore, this study focuses on behavioral methods instead of traditional education. The theoretical framework of this study is empowerment and methods used transtheoretical model and motivational interviewing.

The aim of this present study was to explore how to support the oral health and oral self-care of patients with periodontitis, keeping in mind the role of dental hygienists and dental nurses. To reach that aim, patient motivation methods and behavioral and educational interventions used in oral health care, especially with patients suffering from periodontitis, were evaluated and tested for effectiveness.

Also the current patient education practices and acceptance of the new promotion program by dental professionals was described.

Althought the main focus in this study is on supporting of oral self-care of patients with periodontitis, all educational solutions and methods – combined or alone – are applicable to all other fields of oral health care. Study phases II and IV were carried out as part of the normal clinical work of dental hygienists and nurses. Therefore, the information produced in this study is easily implemented in practical work and will help to develop patient education further in oral health care. Results of this study can also be used in developing education of dental hygienists and practical nurses.

2 Review of the Literature

2.1 Periodontal disease

Periodontal disease refers to both gingivitis and periodontitis; both are initiated by oral bacteria, and the reactions from the inflammatory and immune systems are the predominant features (Kinane & Attsrtöm 2005). More specifically, gingivitis is a direct immune response to plaque accumulation on the gingival margin of the teeth. The clinical signs of gingivitis are redness, swelling and an increased tendency to bleed on probing, toothbrushing or even spontaneously (Kinane 2001). For a long time, prevailing view has been that while gingivitis must precede periodontitis, not all gingivitis progresses to periodontitis (Brown & Löe 1993). Gingivitis is reversible if the plaque is removed effectively from surfaces (Chapple et al. 2018). Intensified self-care is often enough and healing will happen in one or two weeks (Axelsson et al. 1991). Prevention of gingivitis is also a primary preventive measure for periodontitis. For those in whom periodontitis develops, it is the host inflammatory response to the subgingival bacteria that is responsible for the tissue damage and, most likely, progression of the disease (Bartold & Van Dyke 2017).

Periodontitis is a chronic multifactorial inflammatory disease associated with dysbiotic plaque biofilms and characterized by progressive destruction of the tooth-supporting apparatus (Papapanou et al. 2018). Approximately 10–20 different bacteria may play a role in the pathogenesis of destructive periodontal disease. Of these Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Treponema denticola and Tannerella forsythia are well known (Socransky & Haffajee 2005). If these bacterial species are able to colonize, they will start to damage the periodontal tissue. A question has emerged as to whether these bacteria are the cause or the result of periodontitis. There is some evidence that the host response to oral bacteria leads to the tissue changes. These changes lead to an altered subgingival environment that favors the emergence of periodontal pathogens and the subsequent development of periodontitis if the genetic and external environmental conditions are favorable for disease development (e.g. Bartold & Dyke 2013, 2019). It is known that as the peridontal pocket deepens, the flora become more anaerobic and the host response becomes more destructive and chronic. Eventually, periodontitis can lead to the loss of otherwise healthy teeth (Kinane 2001, Larsen &

Fiehn 2017). Unlike with gingivitis, a periodontitis patient remains a periodontitis patient for life, even following successful therapy, and requires life-long supportive care to prevent recurrence of disease (Chapple et al. 2018).

Periodontitis, an inflammatory condition associated with bacterial infection, is modified by multiple host response genes in combination with lifestyle and environmental factors (Bartol & Van Dyke 2013). Well-known lifestyle related risks for periodontal disease are poor oral hygiene (e.g. Axelsson & Lindhe 1981, Papapanou & Wennström 1990, Löe 2000, Helal et al. 2019) and smoking (e.g. Eke et al. 2010, Chapple et al. 2015, Leite et al. 2018, Helal et al. 2019). Other risks are diabetes mellitus (particularly off-balanced; Nascimento et al. 2018, Montero et al. 2019), metabolic syndrome (Lee et al. 2015, Tegelberg et al. 2019), genes (Loos et al. 2015), male gender (Kocher et al. 2005, Shiau & Reynolds 2010), aging (Albandar 2002, Persson 2018), osteoporosis in postmenopausal women (Goyal et al. 2017), low educational or socioeconomical level (Kocher et al. 2005, Boillot et al. 2011), genetic disorders (e.g. Down syndrome, Papillon-Lefèvre syndrome), acquired immunodeficiency diseases (e.g. HIV), inflammatory diseases (e.g. inflammatory bowel disease, arthritis), emotional stress and depression and some systemic medications (Albandar et al. 2018). Besides general risk factors, any plaque-retentive factor such as restoration overhangs or deficiencies may contribute to the local risk of periodontal disease (Kinane 2001).

With current knowledge on pathophysiology, three forms of periodontitis can be identified: necrotizing periodontitis, periodontitis as a manifestation of systemic disease, and periodontitis, which includes the forms previously recognized as "aggressive" or "chronic" (Caton et al. 2018). In this study the focus is on periodontitis. The main feature which identifies periodontitis is a loss of periodontal tissue support. A threshold of interproximal clinical attachment level (CAL, see Chapter 2.1.1) of ≥ 2 mm or ≥ 3 mm at ≥ 2 non-adjacent teeth is commonly used (Savage et al. 2009, Papapanou et al. 2018). A clinically meaningful description of periodontitis includes three indicators: the proportion of the sites that bleed on probing, the number and proportion of teeth with probing depth over certain thresholds (commonly ≥4 mm) and of teeth with CAL of ≥ 3 mm (Holtfreter et al. 2015). For an intact periodontium and a reduced and stable periodontium, gingival health is defined as < 10% of bleeding sites with probing depths ≤3 mm (Chapple et al. 2018).

The prevalence of periodontal diseases in Finland is high. Nationwide statistics from 2004 show that 74% of adults ≥ 30 had gingivitis (men 77%, women 70%). In the same statistics, the prevalence of periodontitis (at least one ≥4 mm pocket) was 64% (men 72%, women 57%). Pocket depth ≥6 mm was in 21% (men 26%, women 16%) of subjects (Knuuttila 2004). Later statistics from 2011 showed no noteworthy improvement: 70% of men and 55.6% of women had at least one ≥4 mm pocket and on average they had deepened pockets in 4.4 teeth (Suominen-Taipale et al. 2012).

Periodontitis is a slowly progressing disease and therefore prevalence increases with aging. It is concerning that the prevalence of periodontitis is high (48%) and severity significant (mean 2.7 teeth) even in the 30 – 34 age group (Knuuttila 2004). Actually, there is a steep increase between the third and fourth decades of life that was driven by a peak in the prevalence at around 38 year of age. Worldwide estimates for the prevalence of severe periodontal disease generally range from 10% to 15% (Kassebaum et al. 2014).

Periodontitis may have consequences for health in general, probably due to systemic infection and inflammation (Hajishengallis 2015). Studies have linked periodontal disease to systemic conditions, such as diabetes mellitus (Preshaw et al. 2012, Nascimento et al. 2018), cardiovascular disease (Beck & Offenbacher 2005, Lafon et al. 2014, Almeida et al. 2018), ischemic stroke (Lin et al. 2019, Fagundes et al. 2019), osteoporosis (Penoni et al. 2017), preterm birth, and low birth weight (Chambrone et al. 2011, Ide & Papapanou 2013, Manrique-Corredor et al. 2019), obesity (Martinez-Herrera et al. 2017) and respiratory diseases (Gomes-Filho et al. 2014). There is also a relationship between periodontitis and cancer risk (Grover et al. 2016), for example, in pancreatic (Heikkilä et al. 2018), lung (Zeng et al. 2016), oral (Shin et al. 2019), and breast cancer (Shao et al. 2018). It has also been suggested that periodontopathic bacterial infections may contribute to the onset and progression of Alzheimer's disease (Krall et al. 2010, Dominy et al. 2019). Besides general diseases, periodontitis has a negative impact upon quality of life, speech, nutrition, confidence and overall well-being (Chapple et al. 2015).

2.1.1 Clinical examination

The prevention and treatment of periodontal diseases is based on accurate anamnesis and diagnosis. Therefore, a thorough periodontal examination is necessary. Prior to conducting a periodontal examination, the extra-oral tissues of the head and neck and all non-periodontal tissues in the mouth should be inspected (Armitage 2004). The clinical periodontal examination consists of assessment of gingival inflammation, plaque, calculus, probing pocket depth, bleeding on probing, loss of attachment, tooth mobility and furcation involvement (Philstrom 2001, Armitage 2004).

For probing periodontal pockets, the tip of the probe is placed with ca 20-gram pressure into the gingival sulcus and kept parallel to the contours of the tooth. The first marking visible (in the tip of a probe) above the pocket indicates the pocket depth in millimeters (Hefti 1997, Wilkins 1999). Probing pocket depth (PD) and clinical attachment level are the most important tools in diagnosing periodontal diseases (Hefti 1997, Holtfreter 2015). However, PD measurements do not necessarily give the best approximation of the loss of supporting periodontal tissues since the reference point from which the measurement is taken, the gingival margin,

may fluctuate in apical or coronal directions (Armitage 2004). More accurate than PD alone is clinical attachment level (CAL) or loss of CAL. CAL is the distance from the cementoenamel junction (CEJ) to the base of the probeable crevice. CAL is an efficient method to assess the presence or absence of loss of supporting periodontal tissues (Armitage 2004, Holtfreter 2015).

Gingival inflammation can often be easily seen when looking for the most common signs: redness, swelling and bleeding. (Armitage 2004). The state of inflammation can be assessed, for example, by the gingival index (GI; Löe & Silness 1963). GI is recorded on buccal, lingual, distal and mesial surfaces of all teeth. Scores and criteria are presented in Table 1. Bleeding is one sign of inflammation and it can be assessed by bleeding on probing (BOP). Bleeding is registered 60 seconds after the pocket probing and assessed as present or absent on four or six surfaces and expressed as the prosentual amount of bleeding sites (Ainamo & Bay 1975).

The amount of dental plaque is assessed by visual inspection with the help of mirror and periodontal probe. There are several different indexes to assess the level of plaque (e.g. Silness & Löe 1964, Quigley & Hein 1962, Turesky 1970, Greene & Vermillion 1964, Cancro 1983). Scores and criteria for indexes used in the present study are presented in Table 1. Four or six sites of every tooth (mesial, buccal, distal and lingual) are probed. The rough amount of plaque can also be assessed as visible present or absent on four surfaces, then calculating the percentage of plaque by dividing present sites by the total number of surfaces (O'Leary et al. 1972). However, the absence of plaque reflects the ability to clean the teeth at a certain time but does not demonstrate whether the cleaning is done on a regular basis (Löe 1967) as opposed to bleeding on probing. Bleeding on probing is a sign of insufficient plaque control in a longer term.

The community periodontal index of treatment needs (CPITN) estimates the level of care by clinical assessment for the presence or absence of periodontal pockets, calculus and gingival bleeding (Ainamo et al. 1982, Cutress et al. 1987) (Table 1). For epidemiological purposes in adult populations, 10 specified index teeth are examined. The data provide a basis for estimating overall population needs in terms of treatment categories. In a dental practice CPITN offers a simple screening method for determining the level of intervention required. The mouth is divided into sextants defined by teeth numbers and all teeth are examined. The highest score for each sextant is noted and recorded (Cutress et al. 1987). However, measures of gingival recession, tooth mobility, intensity of inflammation, precise identification of pocket depths or differentiation between supra- and subgingival calculus are not included in the CPITN (Ainamo et al. 1982, Cutress et al. 1987). Since scoring criteria do not include assessment of periodontal attachment level, CPITN is unreliable as an indicator of periodontitis recurrence (Rams et al. 1996), incidence and prevalence (Baelum & Papapanou 1996) and extent and severity.

Table 1. Criteria and scores of measurement indexes.

Score	**Plaque Index** (Silness & Löe, 1964)	**Plaque Index** (Quigley & Hein 1962, Turesky 1970)	**Gingival Index** (Löe & Sillnes 1963)	**CPITN** (Oral Health Unit of WHO 1981)	**BOP** (Ainamo & Bay 1975**)**
0	The gingival area of the tooth surface is literally free of plaque.	No plaque	Absence of inflammation	No disease (gingival pockets < 3 mm)	Absent. No bleeding 60 seconds after the pocket probing
1	No plaque can be observe by the eye (unless disclosing solution is used) but the plaque is made visible on the point of the probe after it has been moved across the tooth surface.	Separate flecks of plaque at the cervical margin of the tooth	Mild inflammation – change in color and texture	Bleeding on probing, but gingival pockets < 3 mm	Present. Bleeding 60 seconds after the pocket probing
2	The tooth and gingival margin is covered with a thin to moderately thick layer of plaque. The deposit is visible to the naked eye.	A thin continuous band of plaque (up to 1 mm) at the cervical margin	Moderate inflammation – glazing, redness and edema. Bleeding on pressure.	Periodontal pocketing < 3 mm, calculus present with or without plaque retentive factors such as overhanging restorations	
3	Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.	A band of plaque wider than 1 mm but covering less than 1/3 of crown.	Severe inflammation – tendency for spontaneous bleeding and ulceration	Periodontal pockets 4–5 mm	
4		Plaque covering at least 1/3 but less than 2/3 of crown.		Periodontal pockets 6 mm	
5		Plaque covering 2/3 or more of the crown.			

2.1.2 Non-surgical periodontal treatment

The treatment of periodontitis is a process which consists of several factors, and in practice it is lifelong. It includes active periodontal treatment (non-surgical and/or surgical) followed by supportive (maintenance) periodontal treatment. Treatments are done by the team of professionals: dentist, periodontist and dental hygienist (Turani et al. 2013, De Wet et al. 2018). The last, and very important, part of the team is the patient, whose active participation in treatment is necessary (e.g. Turani et al. 2013, Lee et al. 2015, Vatne et al. 2015). Therefore, the first steps after the diagnosis are to inform the patient about periodontitis (causes, risk factors, treatment), support the patient's motivation and engagement in treatment, and train the patient on proper oral self-care (see Turani et al. 2013, Periodontitis: Current Care Guidelines 2016).

This part of the literature review focuses on non-surgical periodontal treatment, supportive treatment and self-care of the patient. Treatment of the most forms of periodontitis will begin with patient engagement and non-surgical instrumentation (Turani et al. 2013). The most important single risk factor for periodontitis is the accumulation of a plaque biofilm at and below the gingival margin, as mentioned earlier (Chapple et al. 2015, Papapanou et al. 2018). Therefore, plaque removal and control is fundamentally important in the prevention and treatment of periodontal diseases. The aim of instrumentation is to disrupt and remove the plaque biofilm to reduce the bacterial challenge, thereby reducing inflammation in the periodontal tissues (Turani et al. 2013, Chapple et al. 2015, Needleman et al. 2015). Non-surgical instrumentation can include hand instruments and/or powered scaler. Calculus and other plaque-retentive factors are removed in the treatment (Turani et al. 2013). Active periodontal treatment should be done to the whole dentition within a month, either by quadrant-per-quadrant or full-mouth, with reassessment of healing in four to six weeks after the treatment (Periodontitis: Current Care Guidelines 2016). Assessment is done by bleeding on probing (BOP) percentage and probing pocket depths. For a long time, the aim used to be BOP ≤ 15% (Sanz et al. 2015), but the 2017 World Workshop on the Classification of Periodontal and Peri‐Implant Diseases and Conditions set a limit lower of BOP: ≤ 10% (Chapple et al. 2018).

Supportive periodontal treatment is important. It has been shown to have a significant impact on periodontal prognosis, BOP percentage, and rate of tooth survival (Axelsson et al. 2004, Costa et al. 2014, Lee at al. 2015). The results are usually stable when maintenance treatment is done with 3- to 12-month intervals. The need for treatment is determined according to the patient's individual risk profile (Lang et al. 2015). Supportive treatment consists of assessment of plaque (location and level), BOP, PD, gingival recession, tooth mobility, furcation and occlusion. After that, dental biofilm and calculus are removed with a hand instrument, powered

scaler or air-polishing. The patient's self-care is checked and the patient trained, if needed (Periodontitis: Current Care Guidelines 2016).

2.1.3 Oral self-care in managing periodontal diseases

As mentioned earlier, the patient has a significant role in supportive treatment of periodontitis. The effectiveness of patient self-care for the prevention of periodontitis and for maintaining a satisfactory oral hygiene status has been demonstrated in many studies (e.g. Jönsson et al. 2006, 2009, Van der Weijden & Slot 2010, Newton & Asimakopouluo 2015, Vatne et al. 2015).

The proper self-care of patients with periodontitis consists of tooth brushing twice a day for at least two minutes with fluoride toothpaste. Brushing longer than two minutes is recommendable (Chapple at al. 2015). With respect to gingivitis and dental plaque, power toothbrushes are more beneficial than manual toothbrushes (Van der Weijden & Slot 2015). Daily interdental cleaning is strongly recommended to reduce plaque and gingival inflammation (Chapple at al. 2015). Evidence suggests that interdental cleaning with interdental brushes is the most effective method for interdental plaque removal (Sälzer et al. 2015, Kotsakis et al. 2018). In the active periodontal treatment phase, using an anti-plaque chemical rinse might be a useful addition to self-care (Serrano et al. 2015). Besides proper oral hygiene, patients with periodontitis should make healthy choices – for example, nonsmoking (see Ramseier et al. 2010). In summary, properly performed oral self-care requires motivated, skilled individuals with sufficient dexterity, effective cleaning devices, and appropriate oral hygiene instruction from dental professionals (Mariotti & Hefti 2015). However, several studies have reported noncompliance with oral health-care recommendations (Suominen-Taipale et al. 2012, Costa et al. 2014, Lee et al. 2015).

2.1.4 Periodontal health

For epidemiological purposes periodontal health can be defined as intact periodontium and a reduced and stable periodontium, bleeding sites as < 10% and probing pocket depths ≤3 mm (Chapple et al. 2018, Trombelli et al. 2018). The World Health Organization (WHO) definition of a health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization 2014). These definitions are quite rigorous and almost impossible to achieve. In clinical practice, the goal of periodontal treatment is a patient with no signs of gingivitis. More specifically, periodontal stability is characterized as minimal BOP (< 10%), no probing depths of 4 mm or greater that bleed on probing, optimal improvement in other clinical parameters, and lack of progressive periodontal destruction (Matuliene et al. 2008, Trombelli et al.

2018). Mariotti and Hefti (2015) proposed that periodontal health can be defined using a modified wellness model which would consist of four cardinal characteristics, including a functional dentition, the painless function of the dentition, the stability of the periodontal attachment apparatus, and the psychological and social well-being of the individual.

Lang and Bartold (2018) proposed that there are four levels of periodontal health, depending on whether the periodontium has normal attachment and bone level or reduced support. The categories are:

1) pristine periodontal health, which is defined as a total absence of clinical inflammation and physiological immune surveillance on a periodontium with normal support
2) clinical periodontal health, characterized by an absence or minimal levels of clinical inflammation in a periodontium with normal support
3) periodontal disease stability in a reduced periodontium
4) periodontal disease remission or control in a reduced periodontium.

2.2 Health promotion and patient education

The most well-known and universally adopted definition of health promotion is that of the World Health Organization's Ottawa Charter from 1986, which was slightly modified in 2005 in WHO's Bangkok Charter for Health Promotion in a Globalized World to: "Health promotion is the process of enabling people to increase control over their health and its determinants, and thereby improve their health" (World Health Organization 2005). The Ottawa Charter includes five priority areas of health promotion: healthy public policy, supportive environments, strengthening community actions, developing personal skills and moving into the future (World Health Organization 1986). In this literature review, the focus is on developing not only personal skills but also knowledge and motivation.

WHO's definition of patient education is "any combination of learning experiences designed to help individuals (and communities) improve their health, by increasing their knowledge or influencing their attitudes" (World Health Organization 2019). Informed opinion and active cooperation on the part of the public are of the utmost importance in the improvement of the health of the people (World Health Organization 2014). In Finland, the content of patient education is governed by legislation: patients have the right to know their health status and goals, alternatives and effects of their treatment as well as issues concerning their care (FINLEX 1992). Patient education is also part of the ethical code for dental hygienists: information about oral health, alternatives for treatment, and expenses

should be explained in such a way that the patient understands them (Finnish Federation of Oral Health Care Professionals 2019).

The aim, content and structure of patient education and educational solutions vary according to each patient's current situation and needs. They range from lifelong management of disease, like self-care of periodontitis (Jönsson et al. 2009b), to temporary management of health situations like surgical tooth extraction (Brasileiro et al. 2012). Patient education can be seen as consisting of planning (assessing the patient's knowledge, expectations, and preferences; setting learning objectives), implementation (methods, timing) and evaluation of outcomes (Leino-Kilpi et al. 1998, Johansson 2006).

There are plenty of patient education theories, methods and models and it seems that education based on psychological interventions are associated with improved self-care (Tedesco et al. 1993, Renz et al. 2007, Newton & Asimakopoulou 2015). Theories that emerged from systematic review (Paper III) are introduced in outline at the end of this literature review. Theories and/or methods used in the present series of studies - empowering patient education (EPE), the transtheoretical model (TTM) and motivational interviewing (MI) – will be introduced in more detail below. Common to these three is the importance of the patient: education starts from the patient's situation, needs, goals, skills, motivation and values. It is understood that patients are the experts of their situation, while professionals are seen as experts of health care (e.g. Kettunen et al 2002, Anderson & Funnell 2005).

The database search of EPE, TTM, MI, self-care and oral hygiene was carried out during the different parts of the study (papers I–IV) and results are utilized in this review. There are no studies of patients with periodontitis in which intervention is purely EPE or TTM and only a few of MI. Therefore, the updated search with additional search terms was carried out in May 15, 2019, with the help of an information specialist, to prevent gaps with keywords or combinations of them (Table 2).

Table 2. Updated literature search 2009–2019 Medline and Cochrane.

ID	Search term
#1	MeSH descriptor: [Oral Health] explode all trees
#2	MeSH descriptor: [Oral Hygiene] explode all trees
#3	(gingiva$ next inflamm$ or gingiva$ next bleed$ or gingiva$ next pocket$ or periodont$ next pocket$ or periodont* near attachment or gingiva$ near attachment):ti,ab
#4	(oral next hygiene or mouth next care or dental next care or care near teeth or mouth next hygiene):ti or (plaque near control$ or plaque near remov$ or interdental next clean$ or inter-dental next clean$ or tooth next clean$ or teeth near clean$):ti,ab
#5	((dental or tooth or teeth or interdental$ or inter-dental$) and floss$):ti,ab
#6	("dental plaque index" or "periodontal index" or "gingival index"):ti,ab or ("ORAL HEALTH" or "DENTAL HEALTH" or "GINGIVAL HEALTH"):ti
#7	{or #1-#6}
#8	MeSH descriptor: [Health Education, Dental] explode all trees
#9	MeSH descriptor: [Patient Education as Topic] explode all trees
#10	MeSH descriptor: [Health Promotion] this term only
#11	MeSH descriptor: [Motivational Interviewing] explode all trees
#12	MeSH descriptor: [Empowerment] explode all trees
#13	MeSH descriptor: [Transtheoretical Model] explode all trees
#14	(educat$ or teach$ or train$ or advice$ or advise$ or instruct$ or quide$ or motivat$):ti
#15	(health$ promot$):ti,ab
#16	((demonstrat$ or motiv* or supervis*) near (toothbrush$ or tooth brush$ or tooth-brush$ or floss$ or oral hygiene$ or interdental clean$ or inter-dental clean$)):ti,ab
#17	motivational next interview*:ti,ab
#18	{or #8-#17}
#19	#7 and #18 with Publication Year from 2009 to 2019

2.2.1 Empowerment and empowering patient education

The concept of empowerment derives from the Latin word *potere*, which means to be able or have the ability to choose (Partridge 1966). Definitions of empowerment are “authority or power given to someone to do something” and “the process of becoming stronger and more confident, especially in controlling one's life and claiming one's rights” (Oxford Dictionary, Lexico 2019). The majority of writings on empowerment make some reference to Paulo Freire and his *Pedagogy of the Oppressed*, originally published in 1968 (Calvès 2009). Freire advocates an active teaching method that would help the individual become aware of his own situation, so that he may obtain the “instruments that would allow him to make choices.” The role of the educator is not simply to transmit knowledge to the student, but to seek alongside him the means to transform the world that surrounds him (Calvès 2009, Freire 2016). The concept of empowerment was adapted to health care in the 1970s.

Miller and Goldstein (1972) implemented an educational strategy to empower diabetic patients to take control their diabetes without increasing their medications.

Several concept analyses of empowerment have been done over the years (e.g. Gibson 1991, Hawks 1992, Skelton 1994, Rodwell 1996, Ellis-Stoll & Popkess-Vawter 1998, Ryles 1999, Kuokkanen 2000, Hage & Lorensen 2005, McCarthy & Freeman 2008, Hermansson & Mårtensson 2011, Castroa et al. 2016). A recent concept analysis proposed that "patient empowerment is a process that enables patients to exert more influence over their individual health by increasing their capacities to gain more control over issues they themselves define as important" (Castroa et al. 2016). The active participation of a patient is an essential element of empowering for patient education; healthcare professionals can only facilitate, not create, empowerment (Gibson 1991, Falk-Rafael 2001). In other words, health care professionals should relinquish power and act as facilitators supporting patients to recognize and increase their own empowerment (Funnell 2004, Anderson & Funnell 2005, Anderson & Funnell 2010, McCallister et al. 2012). Strategies include "providing education for informed decision-making, assisting patients to weigh costs and benefits of various treatment options, setting self-selected behavioral goals, and providing information about the importance of their role in self-management" (Funnell & Anderson 2003). Empowering patient education includes asking questions in order to understand the patients' situation, learning needs, concerns, and priorities. Other ways to assist patients on this path include listening to responses, goal setting, problem solving, educating and supporting patients for ongoing self-management (Feste & Anderson 1995, Funnell 2004). The ultimate goal of patient education is to increase patients' empowerment (Gibson 1991, Ellis-Stoll & Popkess-Vawter 1998, Funnell 2004, Leino-Kilpi et al. 2005). Patients are empowered when they have knowledge that meets their needs to make rational decisions, sufficient control and resources to implement their decisions, and adequate experience to evaluate the effectiveness of the choices (Feste & Anderson 1995, Funnell & Anderson 2003, Johansson 2006).

It was not able to find much on empowerment and periodontitis or oral health (Medline and Cochrane), only a single case study of one patient (Langford 2014) and two studies assess the impact of the empowerment based health coaching in tooth brushing, oral health and diabetes management (Cinar et al. 2014, 2017) with positive results. In other fields of health care, there is more research on empowerment and empowering patient education−for example, cancer care (Marzorati et al. 2018), orthopedic care (e.g. Johansson 2006, Heikkinen 2011, Valkeapää et al. 2014, Kesänen 2018), and diabetes (Anderson et al. 2000, Tol et al. 2015, Cheng et al. 2017), to mention a few. Positive outcomes have been reported on studies of empowering patient education, especially on knowledge: patients gain knowledge and become cognitively empowered (Anderson & Funnell 2005,

Johansson 2006, Heikkinen 2011). Because of the knowledge gained, patients reported a more active role in decision-making (Anderson & Funnell 2005). Besides knowledge and understanding, patient education may also increase beliefs or attitudes facilitating acquisition skills (Jotterand et al. 2016). Empowering patient education also reduced anxiety (Kesänen 2018) and diabetes distress in patients with poorly controlled type 2 diabetes (Cheng et al. 2017) and developed health care skills among type 2 diabetic patients (Tol et al. 2015). However, sometimes empowering patient education can be more time-consuming, it is not always superior to non-empowering education (McCann & Weinmann 1996), and it might be challenging for health care professionals to manage (Kelo et al. 2013). The major barriers that professionals reported were lack of time and experienced overload (Klemetti et al. 2018).

2.2.2 The transtheoretical model: stages of change

The transtheoretical model (TTM) emerged in the late 1970s from a comparative analysis of leading theories of psychotherapy and behavior change. For developers Prochaska and DiClemente, the goal was a systematic integration of a field that had fragmented into hundreds of theories of psychotherapy. The model evolved through research examining the experiences of smokers who were changing their smoking habits on their own. It was determined that people quit smoking if they were ready to do so (DiClemente & Prochaska 1982, Prochaska & DiClemente 1983, Prochaska & Velicer 1997). People do not shift from an unhealthy lifestyle to a healthy one in an instant. Rather, a change in behavior occurs continuously through a process, from stage to stage (Prochaska 1991). Certain principles and processes of change work best at each stage to reduce resistance, facilitate progress, and prevent relapse. Stages can last for a considerable period of time, but they are open to change. The stages are precontemplation, contemplation, preparation, action, maintenance and termination (Prochaska 1991, Prochaska & Velicer 1997, Prochaska et al. 2008, Prochaska et al. 2010).

In the precontemplation stage, people do not intend to take action in the foreseeable future. They might be unaware of a problem with behaviors or they deny having a problem and avoid talking about it. People in this stage often underestimate the pros of changing behavior and place too much emphasis on the cons of changing behavior. In the contemplation stage, people recognize that their behavior may be problematic and they are intending to start the healthy behavior in the foreseeable future. They start to have plans of taking actions towards change, but are not committed yet. People may still feel ambivalent toward changing their behavior. In the preparation stage, people are ready to take action within the next month. People start to take small steps toward the behavior change, and they believe changing their

behavior can lead to a healthier life. However, they still need to convince themselves that the change is required. In the action stage, people have recently changed their behavior. They are intending to keep moving forward with that behavior change. This stage is visible because of acquired new health behavior. In the maintenance stage, people have sustained their behavior change for a while (more than six months). They need to have a strong commitment to prevent relapse to earlier stages. The termination stage is an ultimate goal: people have complete confidence that unhealthy behavior will no longer return. This is rarely reached; often people stay in the maintenance stage, and therefore this stage is often not considered in health promotion programs. For each stage of change, different intervention strategies are most effective at moving the person to the next stage of change. (Prochaska 1991, Prochaska & Velicer 1997, Prochaska et al. 2008, Prochaska et al. 2010).

Not a separate stage but a relevant part of the model is relapse. It is one form of regression, which is a return to an earlier stage. It is not considered to be a failure, but more a way of learning. It might help a person to recognize and process obstacles in behavior change (Prochaska & Velicer 1997).

As mentioned earlier, the transtheoretical model is an integration of theories of psychotherapy (Prochaska & Velicer 1997). One principle of TTM, decisional balance, is an outcome of integrating the decision-making model (Janis & Mann 1977) into the transtheoretical model. The original eight categories are simplified into one with the two basic categories of the pros and cons of a behavior. The balance between the pros and cons varies depending on which of the stages of change people are in (Velicer et al. 1985, Prochaska et al. 1994). The decisional balance scale seems to be successful as a predictor of behavior (Velicer et al. 1985). Another principle, self-efficacy, is integrated into Bandura's self-efficacy theory. Self-efficacy is defined as perceived capability to perform a target behavior (Bandura 1977). This reflects the degree of confidence individuals have in maintaining their desired behavior change in situations that often trigger relapse (DiClemente et al. 1994). It is also measured by the degree to which individuals feel tempted to return to their old habits. Relapse usually occurs in situations where feelings of temptation trump individuals' sense of self-efficacy to maintain the desired behavior change (DiClemente et al. 1985).

The processes of change are activities that people use to progress through the stages. This concept provides important guidance for intervention programs, since the processes are like the independent variables that people need to apply to move from one stage to another (DiClemente et al. 1991, Prochaska & Velicer 1997, Prochaska et al. 2008). The processes of change include ten processes, divided into two secondary factors: experiential and behavioral (Prochaska et al. 1988), described below (Prochaska & Velicer 1997). Experiential processes are 1) consciousness raising. Awareness about the causes, consequences, and cures for a particular

problem behavior. 2) Dramatic relief. Initially produces increased emotional experiences followed by reduced affect if appropriate action can be taken. 3) Self-reevaluation combines both cognitive and affective assessments of one's self-image with and without a particular unhealthy habit. 4) Environmental reevaluation combines both affective and cognitive assessments of how the presence or absence of a personal habit affects one's social environment, such as the effect of smoking on others. 5) Social liberation requires an increase in social opportunities or alternatives especially for people who are relatively deprived or oppressed.

Behavioral processes are 1) Self-liberation is both the belief that one can change and the commitment and recommitment to act on that belief. 2) Counter-conditioning requires the learning of healthier behaviors that can substitute for problem behaviors. 3) Helping relationships combine caring, trust, openness, and acceptance as well as support for the healthy behavior change. 4) Reinforcement management provides consequences for taking steps in a particular direction. 5) Stimulus control removes cues for unhealthy habits and adds prompts for healthier alternatives.

TTM is a widely used and researched model. Originally it was used for smoking cessation (DiClemente et al. 1982, Prochaska & DiClemente 1983, DiClemente et al. 1985, Prochaska et al. 1988, DiClemente et al. 1991, Martinelli et al. 2008, Gokbayrak 2015) but expanded to a broad range of health care areas, such as alcohol cessation (DiClemente et al. 1994), physical activity (Maselli et al. 2019), mammography screening (Rakowski et al. 1992, Prochaska et al. 1994), weight control (Johnson et al. 2008) and healthy eating (Wright et al. 2009).

However, it has been argued that the notion of stages within this theory might be flawed, in that the stages are not genuinely qualitative but are rather arbitrary distinctions within a continuous process (Schwarzer 2001). The differences between motivational and behavioral processes across the stages of change are not sufficiently clear (Schwarzer 2008). Some interventions based on the TTM that have been developed and evaluated to date may have failed to appreciate the true complexity of the task (Adams & White 2003, 2005). Instead of exploring stages of change, many studies have focused on understanding the gap between the intention and action phases (Kaasalainen et al. 2016). In redirecting attention to a self-regulatory process, the transtheoretical model has served an important purpose for applied settings.

A database search (Medline, Cochrane) of periodontitis combined with the transtheoretical model or stages of change model reveals a few studies. It seems that TTM can be successfully applied to chronic periodontitis patients to assess their compliance with the suggested periodontal treatment (Emani et al. 2016). It is useful in determining the stages of interdental cleaning behavior change (Morowatisharifabad et al. 2011, Hashemian et al. 2012, Kamalikhah et al. 2017) and potential indicators of interdental cleaning behavior (Hashemian et al. 2012).

Further, an instrument was developed to identify an individual's current behavior and assess readiness to change by analyzing the distribution of the pros and cons a person considers when making a behavioral change (Tillis et al. 2003). The theoretical framework of the TTM with the motivational interview seems to be useful in oral health counseling for 11–13-year-old schoolchildren (Kasila et al. 2006). Readiness to change seemed to be an important predictor of whether parents adopted and maintained preventive behaviors to improve their child's oral health (Anim & Harrison 2007). Understanding a person's readiness to change could improve the way in which oral hygiene interventions and advice are given in the clinical setting. For example, the TTM staging measurement tool used with dental hygienists' patients provides insight into people's readiness to change their oral hygiene behaviors (Wade et al. 2013). Stages of change in oral health (SOCOH), another model used to assess patients' readiness to change, was developed and tested. It seems to have potential benefits for clinical use, at least when assessing readiness for change regarding oral health behaviors in pregnancy (Jamieson et al. 2014).

2.2.3 Motivational interviewing

While the transtheoretical model is intended to provide a comprehensive conceptual model of how and why changes occur, motivational interviewing is a specific clinical method to enhance personal motivation for change (Miller & Rollnick 2009). Motivational interviewing (MI) was originally developed for addiction counseling and first described in the 1983 (Miller et al. 1993, Miller & Rollnick 2002). In the past, counselors used tactics such as confrontation and shame with problem drinkers. It was believed that using an "in-your-face" method would help people admit their problem and change (Miller et al. 1993). The MI viewpoint is described in Miller and Rollnick's 1991 book, which explained how to talk with people about their addictions in ways that respected their ability to decide. "MI begins with the assumption and honoring of personal autonomy: that people make their own behavioral choices, and that such power of choice cannot be appropriated by another" (Miller & Rollnick 2009). The strategies of motivational interviewing are more persuasive than coercive and more supportive than argumentative. The overall goal is to increase the patient's intrinsic motivation so that change arises from within (Miller & Rollnick 2002).

Motivational interviewing is both a set of techniques and a counseling style. The underlying spirit of MI is partnership, acceptance, evocation and compassion (Miller & Rollnick 2013). Partnership means there is active collaborative conversation and a joint decision-making process between two experts, professional and patient. MI can't be done "to" or "on" someone; it is done "for" and "with" a person. This is essential, because the patient is the only one who can realize a change (Rollnick et

al. 2008; Miller & Rollnick 2009, 2013). Related to a spirit of partnership is an attitude of profound acceptance of what the patient brings. Acceptance means that one honors each person's absolute worth and potential as human being, recognizes and supports the person's irrevocable autonomy to choose his or her own way, seeks through accurate empathy to understand the other's perspective, and affirms the person's strengths and efforts (Miller & Rollnick 2013). Honoring patient autonomy is essential. Professionals should accept that people can and do make choices about the course of their lives. It is up to the patient to follow through with making changes happen. This is empowering to the individuals, but also gives them responsibility for their actions (Rollnick et al. 2008; Miller & Rollnick 2009). The spirit of MI starts from a strengths-focused premise: that people already have within them much of what is needed. The professional's task is to evoke patients' knowledge, insight or skills – which they already have – to activate their own motivation and resources to change (Rollnick et al. 2008; Miller & Rollnick 2009, 2013). The final aspect of the spirit of MI is compassion. To be compassionate is to actively promote the other's welfare, to give priority to the other's need. According to Miller & Rollnick (2013),"to work with a spirit of compassion is to have your heart in the right place so that the trust you engender will be deserved."

There are four overlapping processes that comprise MI: engaging, focusing, evoking and planning. Processes are represented as stair steps (Figure 1). Each later process builds upon those that were laid down before. In the course of conversation one may also walk up and down the staircase, returning to a prior step that requires renewed attention. Engaging is the process by which both parties, professional and patient, establish a helpful connection and a working relationship. Therapeutic engagement is a prerequisite for everything that follows. The process of engaging leads to focus on a particular agenda: what the patient came to talk about. Focusing is the process by which a specific direction in the conversation about a change is developed and maintained. In this process, one or more change goals usually emerges. With the change goal as a focus, the third process in MI is evoking. It involves eliciting the patient's own motivations for change. It occurs when there is a focus on a particular change and the professional harnesses the patient's own ideas and feelings about why and how they might do it. When the patient's motivation reaches a threshold of readiness, they begin talking about when and how to change; this is the process of planning. It encompasses both developing a commitment to change and formulating a specific plan of action (Miller & Rollnick 2013).

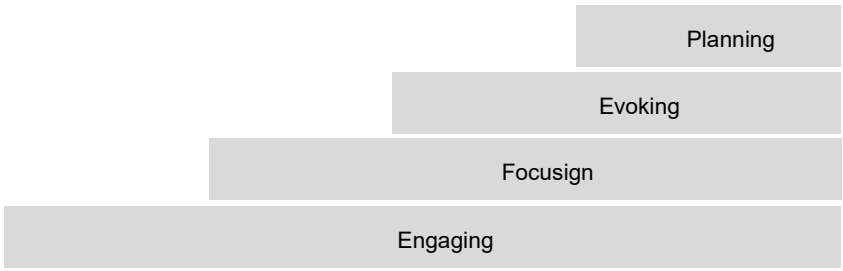

Figure 1. Four processes in MI (modified from Miller & Rollnick 2013).

Core skills used in motivational interviewing are open questions, affirmations, reflective listening and summary reflections (Miller & Rollnick 2002). These skills cut across the four processes and are needed throughout MI, although the particular ways in which they are used may vary with each MI process (Miller & Rollnick 2013). Open-ended questions invite elaboration, thinking more deeply about what is most important to patients, and exploring the reasons for and possibility of change. Using open-ended questions will engage the person, increase understanding, strengthen collaboration, find a focus, evoke motivation, and help develop a plan for change. Affirmations are statements that recognize client strengths. They also provide support and encouragement, but they must be genuine and speak to what is indeed true about the patient. The use of affirmations can help patients feel that change is possible even when previous efforts have been unsuccessful. Reflective listening might be the most important skill in MI and it take conversation to a deeper level. By reflective listening and reflective responses, the patient comes to feel that the professional understands the issues from their perspective. It also guides the patient toward change, supporting the goal-directed aspect of MI. There are several levels of reflection ranging from simple (basically repeating what the patient says) to more complex (a reasonable guess about the patient's meaning). Reflective listening also aids professionals in recognizing "change talk," or statements by the patient revealing consideration of, motivation for, or commitment to change. A careful listener is able to hear desire, ability, reason, or need for change in a patient's talk and reinforce that. The more someone talks about change, the more likely they are to change. And last, motivational interview use summaries. They are a type of reflection where the professional recaps what has occurred in the meeting (Miller & Rollnick 2002, 2009, 2013, Rollnick & Miller 1995, Rollnick et al. 2008).

Besides the spirit, the processes and above-mentioned core skills there are four principles that guide the practice of motivational interviewing.

- Express empathy and understanding through reflective listening. The ability to understand and experience the feelings of another person is a

key interpersonal process in MI. This approach provides the basis for patients to be heard and understood, and in turn, patients are more likely to honestly share their experiences in depth.

- Develop discrepancy. Motivation for change occurs when patients perceive a mismatch between their present state and their goals. A professional practicing MI works to develop this by helping patients examine the discrepancies between their current behavior and their values and goals. When patients recognize that their current behaviors place them in conflict with their values or interfere with accomplishing self-identified goals, they are more likely to experience increased motivation to make a change.
- Roll with resistance, resist the righting reflex. Arguing for change should be avoided. Patient who feel criticized for their behavior will most likely defend themselves instead of considering the change.
- Support self-efficacy and empowering the patient. A patient's belief that change is possible is needed to instill hope about making changes. An important role of a professional is to support patients' belief that change is possible and that they can make a change in their health. (Rollnick & Miller 1995, Miller & Rollnick 2002, Rollnick et al. 2008, Miller & Rollnick 2009, 2013, Moyers & Miller 2013).

Motivational interviewing is widely researched in the field of health care: on Cochrane Reviews alone, 29 on MI can be found (Cochrane Library 2019). Systematic reviews and meta-analyses of MI showed a significant effect on many physiological measures (Rubak et al. 2005, Martins et al. 2009, Lundahl et al. 2013). A database search yielded several studies of periodontitis and motivational interviewing (e.g. Stenman et al. 2012, Woelber et al. 2016, Stenman et al. 2018). In addition, MI combined with other cognitive behavioral principles was found (Jönsson et al. 2009a, 2009b, 2010). In these studies, MI was combined with social cognitive theory (Bandura 1997, Baranowski et al. 2002), theory of reasoned action (Ajzen & Fishbein 1980) and theory of planned behavior (Ajzen 1991).

The studies have obtained promising results. Periodontitis patients' self-care has improved (Jönsson et al. 2010, 2009b). The largest difference was the higher frequency of interdental cleaning (Jönsson 2009b, Woelber 2016). Also clinical results are promising; gingival index and plaque incidences improved among patients who participated in MI sessions (Jönsson 2009b,2010, Woelber 2016). However, two studies of single-session MI (Stenman et al. 2012, 2018) showed no significant difference compared to the control group.

In other fields of oral health care, MI helped parents to accept dental recommendations about preventing caries in their children, and this had a measurable

effect on the children's rates of caries and their oral health (Weinstein et al. 2004). Also adolescents who participated in MI intervention had a lower number of new carious teeth than students in the prevailing education group (Wu et al. 2017).

The effectiveness of motivational interviewing in different fields of oral health care is researched in six systematic reviews (Cascaes et al. 2014, Gao et al. 2014, Borrelli et al. 2015, Kay et al. 2016, Albino & Tiwari 2016, Kopp et al. 2017). The main results of the systematic reviews are presented in Table 3. In summary of these systematic reviews can be said that providing motivational interviewing for parents and children improve family's health behaviors. The use of MI might have a positive influence on clinical periodontal parameters and psychological factors related to oral hygiene, but the potential of MI on improving periodontal health, remains controversial.

Table 3. The main results of systematic reviews of MI and oral health.

Authors, Year, Title	Databases	N Number of studies	Focus of studies and participants	Clinical outcomes* (examples)	Behavioral outcomes* (examples)
Cascaes et al. 2014 Effectiveness of motivational interviewing at improving oral health: a systematic review	PubMed, LILACS, SciELO, PsyINFO, Cochrane Google Scholar	10	Oral health, health behavior Parents of young children up to 5 years old (N=4) Adults. Mean age of 50 (N=6)	Two interventions reported no significant effect on reducing dental caries; one found a positive effect (dmfs) Harrison et al (2007) **Control** B: mean almost 0.0 (2 children) F: mean 7.59 (SD 14.2) B: mean dmfs almost 0.0 (4 children) F: mean dmfs 3.35 (SD 7.8) P=0.001 Significant effect of MI intervention at reducing BOP Brand et al (2012) **Control** B: mean 55.0% of sites (SD 18) F: mean 36.0% of sites (SD 20) **Intervention** B: mean 50.0% of sites (SD 18) F: mean 33.0% of sites (SD 15) p=0.263 Jonsson et al (2010) **Control** B: mean 75.0% of sites (SD 18) F: mean 29.0% of sites (SD 14) **Intervention** B: mean 70.0% of sites (SD 20) F: mean 19.0% of sites (SD 13) p< 0.001 Stemann et al (2013) **Control** B: mean 33.0% of sites (SD 12.4) F: mean 18.4% of sites (SD 14.1) **Intervention**	MI helped parents to accept dental recommendations about preventing caries in their children. Fluoride applicationc Harisson et al (2007) **Control** B: mean 0.0 F: mean 0.25 (SD 0.5) B: mean 0.0 F: mean 3.81 (SD 1.2) P=0.001 Improvements of reported oral hygiene in the MI group compared to control. Lopez-Jornet et al (2012) **Control** Brushing 2x or more per day B: 53.3% (N = 16) F: 90.0% (N = 27) Brushing duration ≥ 2 min: B: 30.0% (N = 9) F: 70.0% (N = 21) Interproximal tooth brushing 1x day: B: 36.6% (N = 11) F: 59.9% (N = 18) **Intervention** Brushing 2x or more per day: B: 86.6% (N = 26) F: 100.0% (N = 30) Brushing duration ≥ 2 min: B: 13.3% (N = 4) F: 80.0% (N = 24) Interproximal tooth brushing 1x day:

				B: mean 36.6% of sites (SD 17.1) F: mean 18.8% of sites (SD 10.9) p> 0.05b Periodontal pockets reduction. Jonsson et al (2010) **Control** PPD 4–5 mm: B: mean 33.0% of sites (SD 14.0) F: mean 12.2% of sites (SD 10.8) PPD ≥ 6 mm: B: mean 9.3% of sites (SD 11.0) F: mean 1.5% of sites (SD 3.2) **Intervention** PPD 4–5 mm: B: mean 31.0% of sites (SD 14.3) F: mean 10.4% of sites (SD 7.9) PPD ≥ 6 mm: B: mean 9.2% of sites (SD9.3) F: mean 1.6% of sites (SD2.9) PPD 4–5 mm: p> 0.05 PPD ≥ 6 mm p> 0.05	B: 19.7% (N = 6) F: 56.6% (N = 17) Brushing 2x or more /day p=0.037 Duration ≥ 2 min p=0.038a Interproximal tooth brushing 1x day p= 0.260
Kay et al. 2016 Motivational interviewing in general dental practice: A review of the evidence	AMED,CINAHL, Cochrane Library, EMBASE, Medline, PsycINFO, PsycARTICLES, ScienceDirect, SocINDEX, ASSIA, Social Policy and Practice, HMIC, The Knowledge Network, Intute, MedNar, Copac, EPPI-Centre, EThOS, OpenGrey, TRIP	8	Oral health, health behavior Adults or adults with periodontal disease (N=6) Children, School children (N=2)	Jönsson et al. 2009, 2012$_a$, 2012$_b$ Between baseline and the 12-month follow-up, both GI and PLI improved more in the experimental group than in the control group. The mean gain-score difference was 0.27 for global GI [99.2% confidence interval (CI): 0.16–0.39, p <0.001] and 0.40 for proximal GI (99.2% CI: 0.27–0.53, p <0.001). The mean gain-score difference was 0.16 for global PLI (99.2% CI: 0.03–0.30, p = 0.001), and 0.26 for proximal PLI (99.2% CI: 0.10–0.43, p <0.001). Weinstein et al. 2004. After one year, children in the intervention group had 0.71 new carious lesions (SD = 2.8), while those in the control group had 1.91 (SD = 4.8) new	Jönsson et al. 2009, 2012$_a$, 2012$_b$ The participants in the intervention group reported a higher frequency of daily inter-dental cleaning and were more certain that they could maintain the attained level of behaviour change.

				carious lesions (t [238] = 2.37, one-tailed P <0.01).	
Albino & Tiwari 2016 Preventing Childhood Caries: A Review of Recent Behavioral Research	MEDLINE via PubMed, Ovid Med, Google Scholar, Web of Science	18	Childhood caries (family-based interventions) Parents of children up to 5 years old (N=5) School children up to 12 years old (N=3)	Wagner et al. (2014) Caries prevalence lower for intervention group Plutzer et al. (2012) Caries increment lower in intervention group: 33% vs 42% in comparison group Ismail et al. (2011) No effect.	Wagner et al. (2014) Toothbrushing at younger age, used fluoride toothpaste, fluoride salt, and supervised toothbrushing more often Plutzer et al. (2012) Not measured Ismail et al. (2011) Improved behaviors checking for precavities, ensuring bedtime and twice-daily brushing.
Borrelli et al. 2015 Motivational Interviewing for Parent-child Health Interventions: A Systematic Review and Meta-Analysis	PubMED, PsycINFO, CINAHL, The Cochrane Library, ERIC, Web of Science	25	Childhood caries (family-based interventions) Parents (mean age 33) Children (mean age 9)	Meta-analysis Dental caries N=1,045 No of studies =3 Positive for difference 0.23 (CI -0.05, 0.50)	Harrison et al. 2012 Weinstein et al.2006 Parent-involved MI was associated with significant improvements in health behaviors. Ismail et al. 2011 Significant effect of MI on oral health behaviors and management (e.g. toothbrushing, visiting the dentist) vs. control groups.
Gao et al. 2014 Motivational interviewing in improving oral health: a systematic review of randomized controlled trials	PubMed MEDLINE, Web of Science, Cochrane Library, PsycINFO	20	Early childhood caries Periodontal health Health behavior Adults with periodontitis (N=9) Children (N=6)	Weinstein et al. 2004, 2006 Harrison et al. 2007 MI + CE group had fewer new caries lesions in 1 year (0.71 versus 1.91; P <0.01) and lower chance of new caries in 2 years (odds ratio = 0.35, 95% CI = 0.15 to 0.83; hazard ratio = 0.54, 95% CI = 0.35 to 0.84) Harrison et al. 2012 Substantially less dentin caries (35% versus 60%) in MI + CE group, especially with four or more MI sessions; Brand et al. 2013	Freudentahl & Bowen 2010 More frequent tooth cleaning (P = 0.001) and less use of shared utensils (P = 0.035). Stewart et al. 1996 Knowledge improvement in both intervention groups; significantly greater flossing self-efficacy improvement in MI group than the other two groups (P <0.05)

				Significant improvement in both groups in BOP, PI, and PD (all p<0.001); no between-group differences at either 6 or 12 weeks	
Kopp et al. 2017 Motivational Interviewing As an Adjunct to Periodontal Therapy – A Systematic Review	PubMed, Cochrane Library, Web of Science	5	Adults with periodontal disease Periodontal health	MI showed a significant positive effect Jönsson et al (2010) Plaque **Control** B: mean 57.0% of sites (SD 17) F: mean 28.0% of sites (SD 13) **Intervention** B: mean 59.0% of sites (SD 18) F: mean 14.0% of sites (SD 12) p< 0.001 BOP Control B: mean 75.0% of sites (SD 18) F: mean 29.0% of sites (SD 14) Intervention B: mean 70.0% of sites (SD20) F: mean 19.0% of sites (SD13) < 0.001b Two studies showed no influence Brand et al (2012) **Control** PPD 4–6 mm: B: mean 23.3% of sites (SD 23.1) F: mean 16.1% of sites (SD 21.4) PPD > 7 mm: B: mean 1.8% of sites (SD 6.9) F: mean 1.4% of sites (SD 5.7) **Intervention** PPD 4–6 mm: B: mean 23.8% of sites (SD 15.8) F: mean 20.3% of sites (SD 15.0) PPD 4-6 mm, p=0.777 PPD > 7 mm: B: mean 2.0% of sites (SD 4.1) F: mean 1.7% of sites (SD 3.9) PPD > 7 mm, p=0.844b	

* Some results are not statistical but in verbal form due to original systematic reviews. B= Baseline, F= Final follow-up

2.2.4 Self-regulation theory of Leventhal, Client self-care commitment model, Cognitive behavioral approach

Theories that emerged from systematic review (Paper III) are introduced in outline here.

Self-regulation theory is a system of conscious personal management that involves the process of guiding one's own thoughts, behaviors, and feelings to reach goals (Reed & Lloyd 2018). There are slight differences in defining the stages or components of self-regulation depending on contributors. One challenge of self-regulation is that researchers often struggle with the conceptualization and operationalization of self-regulation

Generally, self-regulation consists of several stages, and individuals must function as contributors to their own motivation, behavior, and development within a network of reciprocally interacting influences (Reed & Lloyd 2018).

Leventhal's self-regulation theory postulates that people's health behavior in response to an illness is determined by the representation of their illness. In Leventhal's model, representations of illness comprise five major dimensions. The first is identifying the disease label and its symptomatic indicators. The second, called the timeline, pertains to whether the disease is acute, cyclic, or chronic. The third concerns the social, economic and physical consequences of the illness. Fourth are the risk factors of the disease, such as genetic factors or poor plaque control. The fifth and final dimension concerns the potential for cure or control (Leventhal et al. 1998, Leventhal & Diefenbach 1992).

Leventhal's model has been used in some studies in the field of dentistry (Ramsay et al. 2000, Philippot et al. 2005, Godard et al. 2011). Applying Leventhal's theory in a behavioral or educational intervention significantly improves oral hygiene (Philippot et al. 2005). This improvement can be explained by a better perspective on the part of the patient regarding the illness, its symptoms and possible symptom diminishment with new effective behaviour. (Godard et al. 2011).

The client self-care commitment model focuses on the patient's self-care. It uses components of three other models to create a new one: the dental hygiene human needs model, client empowerment model, and explanatory model. The method implies that the dental hygienist (DH) works in dialogue with patients aiming at support their empowerment. The dialogue results in a commitment where the patients establish goals set by themselves. The model includes five domains: initiation, assessment, negotiation, commitment and evaluation (Bowen & Pieren 2019).

The initiation domain means that the patients bring their own explanatory model of self-care methods and disease processes, beliefs and values. The DH must identify these beliefs and assist the patients in disclosing their main concerns. During assessment, the dental hygienist uses questions and strategies to disclose a patient's

perceptions of self-care behaviors, knowledge of biomedical facts and illness experiences. Once the DH and the patient share their explanatory models, they become co-therapists who negotiate self-care practices, treatment and recall interval. After negotiation, the patient is able to commit to self-selected goals for self-care. Dental hygienist support validates choices and helps the patient achieve their goals. In the last phase of the client self-care commitment model, the patient reports actual self-care performed and the dental hygienist shares clinical assessment findings (Bowen & Pieren 2019). The client self-care commitment model has been developed for dental hygienists and is used in some studies (Calley et al. 2000, Jönsson et al. 2006) with positive outcomes.

The cognitive behavioral approach, in this case social cognitive theory, is a theoretical framework used for describing and understanding how different factors influence health behavior. It states that the characteristics of a person, behavior of the person and environment within which the behavior is performed interact with each other (Baranowski et al. 2002). While it may seem that one factor is dominant, there are numerous factors that play a role in human behavior. Furthermore, the influencing factors are not of equal strength, nor do they all occur concurrently (Wood & Bandura, 1989). The social cognitive theory is composed of four processes of goal realization. The processes are self-observation: observing oneself can inform and motivate; self-evaluation: comparing one's current performance with a desired performance or goal; self-reaction: reactions to one's performance can be motivating; and self-efficacy: one's belief in the likelihood of goal completion can be motivating in itself. These components are interrelated, each having an effect on motivation and goal attainment (Zimmerman 2001). There are some studies based on social cognitive theory in field of dentistry (Schüz et al. 2007, Jönsson et al. 2009).

2.2.5 The role of dental hygienists and dental nurses in health promotion and patient education

Dental hygienists are oral health care professionals whose competencies are in disease prevention, health promotion and periodontal therapies (Ohrn 2004, Luciak-Donsberger & Eaton 2009). Dental hygienist education in Finland is similar to that in the other Nordic countries; the key studies are health promotion and oral health care, and research and development (Luciak‐Donsberger & Eaton 2009). The working profile of dental hygienists varies from country to country but the basic professional duties of dental hygienists are quite the same worldwide. These are examining the condition of the teeth, gingivae or supporting structures; oral prophylaxis; periodontal therapy, to prevent oral disease; and giving instructions, information and education on oral hygiene (Johnson 2009, International Federation of Dental Hygienist 2019). Besides dental hygienists, in-service trained dental nurses

are also allowed to carry out examinations and preventive procedures for young children (FINLEX 2010).

According to the DH educators, dental hygienists' skills at work are neither fully nor effectively utilized, even though their education meets the needs of working life quite well. The educators felt that hygienists' professional competence would prove more useful, for example, in health promotion. Clarifying the division of labor in periodontal therapy could also be improved (Jokiaho et al. 2017). Regardless of profession, for all dental professionals it is critical to master science-based understanding of disease prevention (Horowitz et al. 2017) and have a good working knowledge of the models and theories of health promotion and patient education (Hollister & Anema 2004).

2.2.6 Summary of literature review

The literature review has shown that periodontitis is a large problem globally. A great deal is known about the risk indicators of periodontitis and on the other hand the risks which periodontitis affect in general health. Periodontitis is a preventable disease but for those whom periodontitis develops, it is the host inflammatory response to the subgingival bacteria that is responsible for the tissue damage and, most likely, the progression of the disease.

Treatment of periodontitis is in practice lifelong and it is done in collaboration of the dentist, periodontist, dental hygienist and patient. Properly performed oral self-care requires motivated, skilled individual with sufficient dexterity, effective cleaning devices, and appropriate oral hygiene instruction from dental professionals. Therefore, patient education through effective methods is essential.

A number of studies have been done about educational and behavioral interventions to promote oral health. Many times, these studies include some elements, which can not be implemented in practice in the raw. For example, patients might have additional visits to dental care or meetings with psychologist. There is still a need for practice-based, intervention study on how to support the motivation of patients with periodontitis to take up the baton and engage in self-care.

In conclusion of the theoretical background of this study can be said that patient empowerment is the main concept. Patients are empowered when they have knowledge which meet their needs, but besides knowledge they have motivation to take action to the benefit of health. Transtheoretical model and motivational interviewing are methods of reaching that aim, the empowerment of the patient. With the help of TTM it can be assessed what is patient's motivation level, where "the stage of change" he or she is and from that point, choose content and educational solutions. Motivational interviewing is a concrete method of supporting patient's motivation and ability to make a change.

3 Aims of the study

The aim of this study was to explore how to support the oral health and oral self-care of patients. To reach that aim patient education methods and behavioral and educational interventions used in oral health care, especially with patients suffering from periodontitis, were evaluated and tested for effectiveness.

The specific objectives were to:

- Describe the current patient education practices of dental hygienists by exploring their views of their skills and knowledge related to patient education and by determining the implementation of patient education in their work, with regard to both method and content (I).
- Analyze how dental professionals accepted the TTM based oral health promotion programs, how they experienced them in practice, and how the training affected their motivation for the work (II).
- Evaluate behavioral and educational interventions used to improve self-care in adult periodontitis patients in comparison with conventional instruction (III).
- Determine the effectiveness of the motivational interview for the oral health and the self-care of patients with periodontitis in comparison with traditional education (IV).

4 Material and methods

4.1 Research design and participants in the studies

The aim of this study was to explore how to support the oral health and oral self-care of patients, especially patients with periodontitis. The first phase was to gain an overview of current patient education practices among dental hygienists. The second phase included education on a new health promotion program, based on TTM, for dental professionals and a questionnaire on how they accepted the program. The third phase clarified what kind of behavioral and educational interventions are used in oral health care, especially with patients suffering from periodontitis. On the basis of the results of these three phases, an RCT study based on motivational interviewing was conducted and tested for effectiveness (see Figure 1). The work was carried out in different phases from 2007–2019.

The study was approved by the Ethical Commission of the University of Turku (paper I, IV), the Hospital District of Helsinki and Uusimaa (paper II). Permission to conduct this study from Welfare Division of the City of Turku was obtained (paper IV). Study phase II is registered in Clinicaltrials.gov with the identifier NCT01854502 and study phase IV with the identifier NCT04023500.

An overview of all phases of study design, sample, measurements and statistics is presented in Table 4. In the first phase, the data were collected among dental hygienists who were members of the Finnish Association of Dental Hygienist and who were working. A systematic sample was taken so every second dental hygienist was included (n = 416). The semi-structured questionnaire (Appendix) was mailed to the dental hygienists in the winter of 2007 and they were supposed to return it in a stamped envelope. The response rate was 53% (n = 222). (Paper I)

In the second phase, the data were collected among dental hygienists and in-service trained dental nurses (n=28) involved in promoting dental health to small children in Vantaa public dental services. This phase was one part of a wider study carried out in the Vantaa public service during 2008–2011 by Arpalahti (2015). A structured questionnaire (Appendix) was sent to all subjects who were trained to use the new health promotion program based on the transtheoretical model. The response rate was 89% (n=25). (Paper II)

A systematic review was conducted in phase III in order to evaluate behavioral and educational interventions used to improve self-care in adult periodontitis patients in comparison with conventional instruction. A systematic electronic search of empirical studies that were published up to June 2017 using the MEDLINE database was performed. A total of 1806 articles were identified. Six articles fulfilled the inclusion and exclusion criteria. (Paper III)

In the fourth phase, the data were collected among adults with diagnosed periodontitis (n=28) randomly assigned to two groups (intervention n=15, control n=13; for the description of the interventions, see Chapter 4.2). The participants were recruited from July 2014 until April 2015, at dental visits in a public oral health care setting in the City of Turku. The study was designed as a randomized, double-blinded, controlled clinical trial of 6-month duration. Treatment and intervention were carried out by dental hygienists, and baseline and follow-up clinical measurements were done by a periodontist. There were no statistically significant differences between groups at the baseline. (Paper IV)

Table 4. Overview of study design, sample, measurement and statistics.

Design	Sample	Data collection	Outcome measurements	Statistics
Descriptive (Paper I)	Dental hygienists n=222	NCE©/ EPNURSE© modified for this study	Self-reported skills and knowledge related to patient education	Fisher's exact test Mann-Whitney U
Descriptive (Paper II)	Dental professionals n = 28	Purpose designed questionnaire	Opinions of dental professionals	Fisher's exact test Mann-Whitney U
Systematic review (Paper III)	Intervention studies n=6	CONSORT analysis frame	Clinical findings Self-reported self-care Patient evaluations of the intervention	
Randomized controlled trial, double-blinded (Paper IV)	Patients with diagnosed periodontitis (CPI 3) (n=21) intervention (n=9), control (n=12)	Clinical examination CAT© Open questions of self-care	Bleeding on probing (BOP) Probing pocket depth (PD) Clinical attachment level (CAL) Communication assesment tool (CAT) Self-care questionnaire	RM ANOVA Mann-Whitney U Wilcoxon rank-sum test

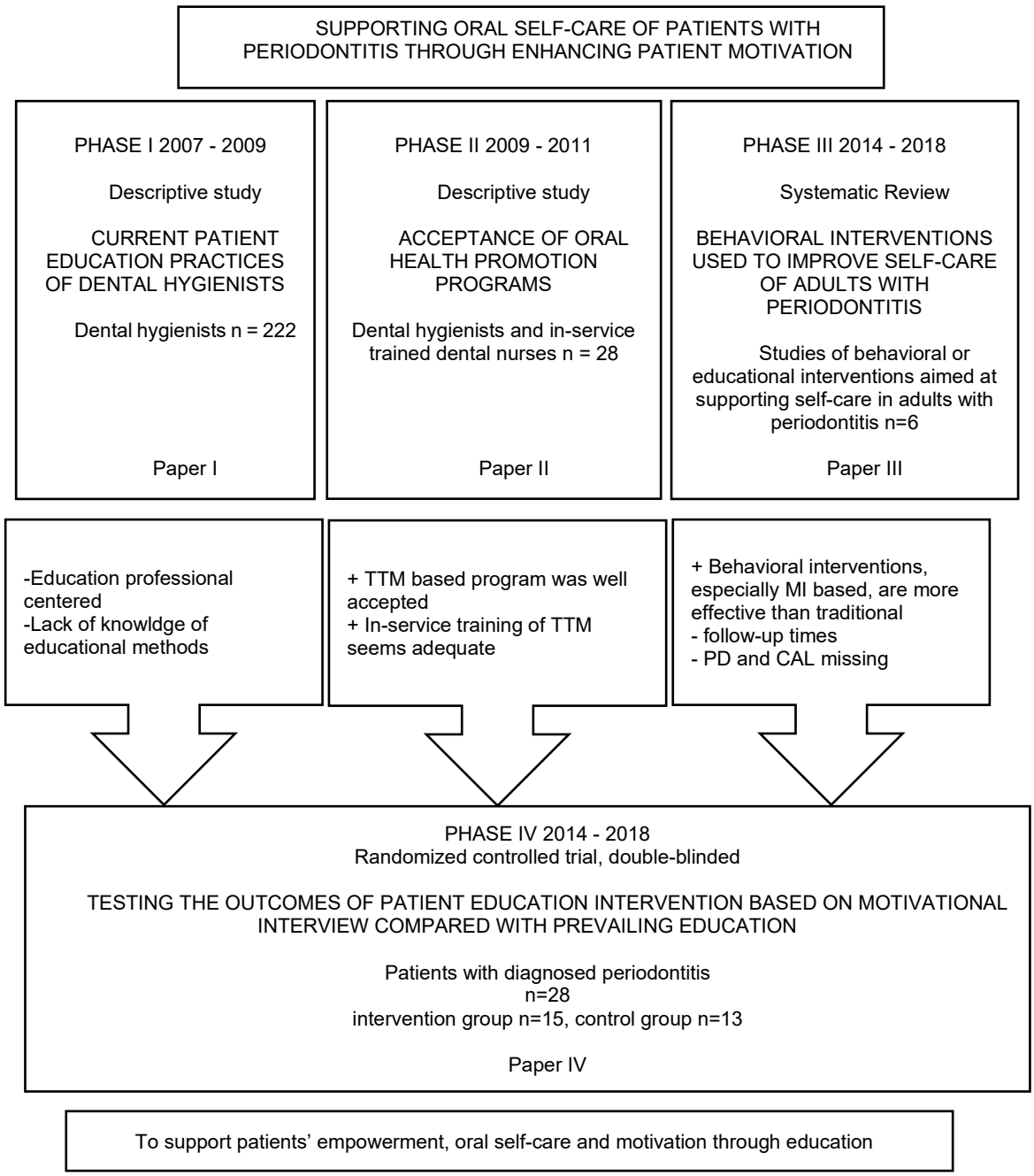

Figure 2. The study design.

4.2 Interventions

Educational interventions based on transtheoretical model and motivational interviewing were used in phases II and IV. The transtheoretical model (TTM) was selected as a theoretical framework for preventive counseling for phase II (Prochaska et al. 2008) because professional-oriented methods may not in practice produce favorable results (Hausen et al. 2000). The model helps to select the individual level of decisional balance and to focus on personal conversation and goal setting in the counseling. In TTM, people move through the stages of precontemplation, contemplation, determination, action and maintenance or relapse (Prochaska et al. 2008).

In phase II, all dental hygienists and in-service dental nurses who were involved in the health promotion of young children were trained for purposes of the study. Altogether, the training consisted of 40 hours, including MS plaque testing and education on how to interpret the results. The training of the new health promotion program (II) was done through lecture (present author and another RDH, MNS) and written instructions. The lecture was a half-day session and consisted of education on the transtheoretical model (TTM).

The transtheoretical model was selected as a theoretical framework for a health promotion program because it helps to determine the individual level of motivation and readiness to make a change. The idea was that the individual stage of change for oral health behaviors could be defined using TTM. Goal setting for beneficial habits with the small children's parents was done through conversation.

Stages can be understood as people's thoughts, feelings and attitudes, the dental professionals were advised to determine the patient's stage and give individuals counseling that was suitable for their stage. In the training, it was emphasized that behavioral change is a process and relapsing is common. The use of TTM in counseling was not the only intervention; depending on the group, the novel program emphasized either fluoride and cleaning or xylitol and nutrition (versus the prevailing program, which consisted of all the above elements, but on a more universal level). However, in this study the use of and acceptance of TTM was our main interest and was sorted out by a questionnaire.

MI is one of the most effective and well-documented psychological and behavioral interventions for supporting behavior change (Rubak et al. 2005, Martins et al. 2009, Lundahl et al. 2013). It is a collaborative, person-centered form of guiding to elicit the person's own reasons for behavior change and strengthen motivation for change. Practitioners use reflective listening in a directive manner to reinforce change talk so a person can generate his or her own ideas for solutions (Miller & Rollnick 2009, Rollnick & Miller 1995). Hearing oneself argue for increased change consolidates belief that change is important and helps people take ownership of their plans (Galvão Gomes da Silva et al. 2018).

The intervention tested in phase IV was based on the motivational interview method (MI). For the randomized controlled trial, two dental hygienists in the intervention group and two in the control group were trained. Dental hygienists were allocated to the intervention or control group by drawing lots. The length of training was three 45-minute sessions, which is the typical length for a half-day in-service training. Trainings were done by the present author, who has given lectures and workshops on MI for several years.

In the intervention group, first it was determined whether the dental hygienists had prior knowledge of MI. Based on that, a lecture on basic principles of motivational interviewing was given. Dental hygienists were trained to use open-ended questions, reflective listening, affirmation and support of self-efficacy. The focus was on patients' views of their oral health, self-care skills and need for oral-health-related behavior changes. Training for dental hygienists in the intervention group was held in a treatment room, so after the lecture, MI was trained in practice. Examples of practice training were how to call the patient into the room, how to greet, and how to start the conversation and follow MI principles in the conversation. During training, dental hygienists were encouraged to ask questions if anything was unclear. They were also given an opportunity to email after training if they had some questions.

In the intervention group dental hygienists were supposed to use open-ended questions, reflective listening and reinforcing with patients. Dental hygienists were trained to support patients in decision-making, although patients are addressed as active agents. They were also encouraged to demonstrate the state of gingival health for the patients, for example, showing the patients gingival pockets in the mirror.

Training with dental hygienists in the control group started with finding out what kind of patient education they were currently giving. Both dental hygienists had good communication skills, but there were no elements of MI in their patient education. Dental hygienists were trained to use professional centered education, which is a prevailing type of education (I). That means dental hygienists assess based on their professional knowledge what a patient's needs are for knowledge, skills and behavior change.

In the control group dental hygienists were supposed to assess patients' learning needs and the kinds of changes they should make based on the hygienists' professional knowledge. They did not use open-ended questions and they did not try to call patients for conversation. Dental hygienists were encouraged to give straightforward advice about oral self-care for patients and if the patients had something to ask, they obviously answered the questions.

4.3 Data collections and analyses

The design, samples, methods of data collection, outcome measures and statistics used in this study are summarized in Table 4. The data for these descriptive studies and the randomized controlled trial study were collected using questionnaires and clinical examination from 2007 ‑ 2017. Based on the knowledge gained from phases I ‑ III, the randomized clinical trial was designed and tested in phase IV. The validity and reliability of all data collection-related issues are discussed in Chapter 6.1.

4.3.1 Questionnaires

Altogether four questionnaires were administered during the study: two for dental professionals (I, II) and two for the patients with periodontitis (IV; Appendices).

4.3.1.1 Phase I

The first questionnaire in this study was NCE© (Johansson et al. 2001, 2002. Nowadays known as EPNURSE see Klemetti et al. 2018), which was modified for this study. This was used in order to find out current practices in patient education from the perspective of dental hygienists. In addition, the relationship between demographic factors pertaining to dental hygienists and patient education practices were studied. The questionnaire was mailed to the dental hygienists; they were asked to complete the questionnaire and return it to the researcher in a stamped envelope. The questionnaire included questions about:

- demographic variables (12 items)
- communicating information about patients' condition (20 items, e.g. I provide education on symptoms related to the patient's illness, I provide education on costs and benefits, I provide education on how to recognize feelings concerning illness)
- structure and educational solutions/patient education (a total of 23 items, e.g. I provide education by showing, I provide education by using computer, I assess patients' educational needs by using a questionnaire)
- dental hygienist's patient education skills (six items, e.g. communication skills, mastering the content and skills in assessing patients' educational needs)
- knowledge of basic oral health care (15 items, e.g. knowledge of caries, malocclusion and halitosis)

The items were rated by the respondent on a four-point scale (1 good – 4 poor; 1 all patients – 4 none of the patients).

4.3.1.2 Phase II

The second questionnaire designed for this study (II) was sent to dental hygienists and in-service dental nurses by e-mail. After filling in the form, they printed it out and sent it anonymously to the corresponding researcher. The first part of the questionnaire included demographic variables, the second part concerned appointments for the visits, and in the third part, the subjects were asked for their opinions on the instructions given and the materials made available for the study. Details of the visits were requested in the fourth part. They concerned the reception room, escorting of the child, and the attitudes of the parents to whom the health education was given. In the fifth part, there were questions about the recording of the information on the visits. In the last part of the questionnaire, the respondents were asked about their attitudes to their work throughout their career and during the study.

4.3.1.3 Phase IV

Two different questionnaires for the patients were administered during last phase of the study (IV). The questionnaire on their oral health, self-care and need for change in oral health habits was given to the patients as a baseline and at three and six months' follow-up. This questionnaire was designed for the purposes of this study and included 22 questions. Five pertained to experienced oral health, eight to self-care and nine were about their need for change and if they have had any support for change. The baseline questionnaire was given to the patient at enrollment in the study and patients returned it in a sealed envelope on the baseline visit. The three-month follow-up questionnaire was also handed out at the baseline visit but the patient was asked to fill it out just before attending the three-month follow-up visit. The same was done with the six-month follow-up questionnaire.

The patients' perceptions of the dental hygienists' interpersonal and communication skills were assessed through the Communication Assessment Tool (Makoul et al. 2007) right after the meeting with the dental hygienist. The CAT is a 14-item survey with a five-point rating scale (1=poor, 2=fair, 3=good, 4=very good, 5=excellent). The questionnaire was given to patients during their dental hygienist visit and they returned it at the three-month follow up together with the self-care questionnaire. All questionnaires for patients were paper-and-pen questionnaires.

4.3.2 Systematic review

The detailed search strategy of systematic review (phase III) is presented in Paper III, Table 1. Inclusion criteria were as follows: studies of behavioral or educational interventions aimed at supporting self-care in adults with periodontitis where

participants are ages 18 or over. Self-care was defined as both brushing and interdental cleaning. The exclusion criteria were: interventions focusing on the use of pharmaceuticals or those comparing oral hygiene products, participants' pocket depths being <4 mm, or participants who had only gingivitis.

4.3.3 Clinical examinations

To evaluate the gingival health and patients' self-performed periodontal infection control, clinical examinations were done on the baseline visit and the three- and six-month follow-ups (IV). The examination was carried out by the same dentist specialized in periodontology (MP) in every visit. The information from the clinical examinations was written down on a form designed for this study.

Probing pocket depth (PD) was measured at mesial, distal, lingual and buccal surfaces.

Bleeding on probing (BOP) was registered 60 seconds after the pocket probing and assessed as present (1) or absent (0) on the same four surfaces as PD.

Clinical attachment level (CAL) was measured as the recession from the cemento-enamel junction plus the depth of the periodontal pocket. For analysis only interproximal CAL was used.

4.3.4 Statistical methods

In phase I the data were analyzed using SPSS for Windows (13.0) software (SPSS Inc., Chicago, IL, USA). Descriptive statistics (frequencies, percentages, means, standard deviations and range) were used to summarize the demographic data and Fishers exact test was used to examine demographic data and sum variables. The sum variables related to the content of patient education were formed based on the theoretical framework of empowering knowledge of Leino-Kilpi et al. (18). According to this theoretical framework, patient education is viewed through six different lenses. The sum variables were bio-physiological (identification of the symptoms and signs), functional (activities of daily living), cognitive (receiving enough knowledge and the ability to use it), experiential (emotions and earlier experiences), ethical (feeling of appreciation as an autonomous individual) and financial (costs and benefits) (18). Sum variables related to basic dental care and the dental hygienists' assessments of their educational skills were calculated. The differences between the demographic factors concerning sum variables and single items were analyzed using non-parametric tests. By convention, 0.05 was the accepted level of significance.

In phase II the answers about experiences and attitudes were cross-tabulated by group, education, age and experience in children's health care. The differences were

tested in relation to answering activity, experiences and attitudes between the new programs and the routine program, between the dental hygienists and the in-service trained dental nurses, and between the respondents with less experience and those with more experience in children's dental care. The differences between groups were analyzed for statistical significance using the Fisher's exact test in relation to demographic data and between the programs using the Mann‑Whitney U-tests in relation to experiences and attitudes. The statistical software used was PASW statistics 18.0 (IBM Corporation, Somers, NY, USA), and the level of statistical significance was set at $p < 0.05$.

In the fourth phase the distributions of study variables were studied and described. Measurements in BOP, PD, and CAL between prevailing treatment and motivational interview at different visits were reported as means and standard deviations (SD). The measurement of site specific changes between visits were evaluated using analysis of variance for repeated measurements (RM ANOVA). If normality assumptions were violated, the change calculated from the previous visit was evaluated between treatments using the Mann-Whitney U-test. For experimental treatment, the changes calculated from previous visits were analyzed using paired t-test, and if normality assumptions were violated, with Wilcoxon rank-sum test. The level of statistical significance was $p<0.05$. The statistical analysis was performed using SAS software, version 9.4, 2018 (SAS Institute Inc., Cary, NC, USA).

For each question of the communication assessment tool, the mean overall score and standard deviation were calculated. Of the self-care questionnaire, the frequencies of "need for change" and actions for change were calculated.

4.4 Ethical questions

The general principles of research ethics were adhered to at all stages of the study (Finnish Advisory Board on Research Integrity 2012). The discussion here begins with the processes of obtaining the necessary permission to carry out the research and to use data collection instruments. Then, ethical questions concerning the research and data collection are discussed from the point of view of the issues of informed consent, voluntary participation, anonymity and protection of participants from discomfort and harm (Gray et al. 2017).

The study was approved by the Ethical Commission of the University of Turku. Permission to conduct phase II was granted by the Hospital District of Helsinki and Uusimaa (II). Permission to conduct phase IV was obtained from Welfare Division of the City of Turku. Approval to keep a patient record during the study was obtained from the Office of the Data Protection Ombudsman (IV). Study phase II is registered in Clinicaltrials.gov with the identifier NCT01854502 and study phase IV with the identifier NCT04023500.

Permission to use and modify the questionnaire NCE was obtained from the head of an Empowering Patient Education research group (Professor Leino-Kilpi). Permission to use and translate the questionnaire CAT into Finnish was from the developer (Dr Makoul). Other questionnaires were developed for this study.

Participation was voluntary for all participants in all phases of this study. Dental hygienists (Paper I) and dental professionals (II) who returned their questionnaires were considered to have given voluntary informed consent. Patients who were called to participate in the RCT study (Paper IV) were provided written information about the study (Appendix). The information letter included information about baseline and follow-up visits, about treatment provided by dental hygienists, possible costs and benefits. Both the cover letter and the informed consent form made it clear that participation was voluntary and the data collected would be handled anonymously and confidentially. Although the fourth phase of the study included comparison between two groups, there was no placebo group. All patients received some intervention (prevailing education or education based on MI) and professional scaling and root planning, and therefore there were no ethical problems with respect to non-treatment. In phase III systematic review was done and no ethical issues were involved.

5 Results

The results are reported in four parts. The first part describes the patient education practices of dental hygienists and their self-reported skills and knowledge (Paper I). The second part describes the acceptance of novel oral health promotion programs by dental hygienists and in-service trained dental nurses (Paper II). The third part describes systematic review of interventions implemented with patients with periodontitis and main results of interventions (Paper III). The fourth part reports results of the RTC study of MI intervention aimed at patients with periodontitis (Paper IV).

5.1 Demographic information of phases I, II and IV

Demographic data in study phase I and II have similarities although they were gathered at different times (Paper I 2007-2008, Paper II 2009–2011) and in different areas (Paper I nationwide, Paper II City of Vantaa). The mean age of the dental hygienists (n=222) in phase I was 43 years (range 23–64). After graduating as dental hygienists, they had worked an average of 14.1 years (range 1–34, SD 9.3) and over half of participants (62%) worked in public dental services. (Paper I)

In phase II the mean age of dental hygienist and nurses (n=25) was 42 years (age range 26–60). The mean experience for health education of small children was 9 years (range 1–30 years). All of them worked in public dental service. (Paper II)

The participants in phase IV consisted 28 participants (MI group 9 women, 6 men, control group 6 women, 7 men). Twelve of the patients were current smokers, six in both groups. There were no statistically significant differences between the two study groups in any of these aspects, indicating a successful random allocation. Six participants in the MI group and one in the control group did not complete the study. (Figure 3)

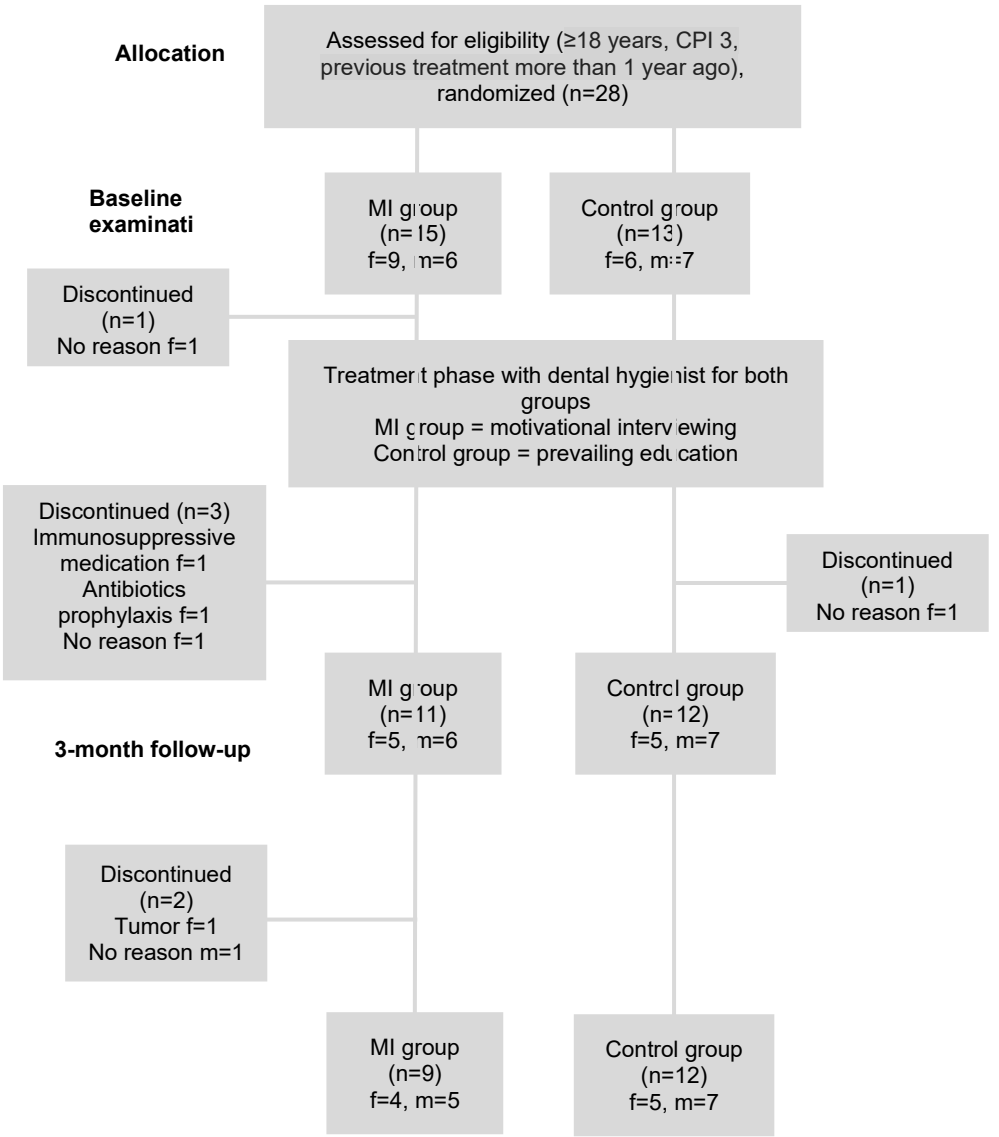

Figure 3. Flow chart of the patients and reason for dropout. f= female, m= male.

5.2 Patient education delivered by dental hygienists: current practice

Dental hygienists (n=222) assessed their patient education skills as fairly good (on scale 1 good – 4 poor, median for the items 1.7, interquartile range 1.3–2.0). Rates described as percentages in Table 5.

Table 5. Self-reported patient education skills.

Education skills	Good (scale 1–2) %	Poor (scale 3–4) %
Interaction with patient	99	1
Content of education	99	1
Assessment of patient learning needs	98	2
Setting of patient learning objectives	96	4
Evaluating of patient learning outcomes	92	8
Different educational methods	88	12

Assessment of patient's learning needs was done through informal interviews (95%). In addition, 60% of dental hygienists used other methods, like assessment of learning needs after clinical examination, dyeing of plaque, anamneses or information received from dentist. Learning objectives were set by 87% of dental hygienists; 53% of hygienists set learning objectives together with a patient. Learning objectives were skills (99%) and gaining knowledge (97%), rarely behavior change (6%), improved oral health (3%) or patient engagement to self-care (2%).

The content of current patient education in 2007‑2008 was analyzed from the empowering viewpoint (Leino-Kilpi et al. 1998, 1999). Education was divided into the following dimensions: biophysical (identification and management of symptoms and signs), functional (activities of daily living), cognitive (knowledge and ability to use it), social (support from social network), experiential (experiences, expectations), ethical (autonomy, patients' rights) and financial (financial support) (Leino-Kilpi et al. 1998, 1999). Dental hygienists revealed that the education they gave consisted mainly of issues concerning functional matters (e.g. toothbrushing and flossing techniques), followed by the cognitive aspects, such as knowledge about oral illness and care (Table 6).

Table 6. The content of patient education (Modified from original publication I).

Area	Q_1	md	Q_2
Functional	1.00	1.00	2.00
Cognitive	1.44	1.67	2.00
Biophysiological	1.33	2.00	2.00
Ethical	2.00	2.00	2.50
Experiential	1.75	2.25	2.50
Financial	2.00	3.00	3.00

md, median; q1, lower quartile; q2, upper quartile.
Scale, every patient (1) – none of the patients (4).

According to most of the dental hygienists (91%) learning outcomes were assessed in informal interviews. In addition, 80% of the dental hygienists checked the outcome by asking the patient to show how to do something or by asking the patient to self-evaluate his or her learning outcomes (67%).

Dental hygienists assessed patient education as a very important or important part of their work, but 70% reported that lack of time interferes with their work. Patient education was usually given at the same time as treatment (93%). One education session usually lasted 5 to 10 minutes or less (58%).

5.3 Acceptance of oral health promotion programs by dental hygienists and in-service dental nurses

Dental hygienists and dental nurses' experiences of and attitudes toward a TTM-based oral health promotion program can be seen in Table 7. In addition, dental professionals with less work experience felt they had advanced as professionals and gained at least some new practices for their work. The motivation for working had increased more for in-service trained dental nurses compared with dental hygienists.

Table 7. Dental hygienists and dental nurses' experiences of and attitudes toward TTM-based oral health promotion program (Modified from original publication II).

Question	All n=25 %	New program n=19 %	Routine program n=6 %	Dental hygienists n=19 %	Dental nurses N=6 %
Has the education related to the prevention study increased your knowledge or skills?					
Yes	12	16	0	5	33
In some degree	52	53	50	63	17
Slightly	24	16	50	26	17
Very slightly or not at all	12	16	0	5	33
		$P = 0.467$		$P = 0.808$	
How useful have you felt the transtheoretical model (TTM) in counseling?					
Useful	9	12	0	6	20
Quite useful	43	47	33	44	40
Slightly useful	35	41	17	39	20
Very slightly	13	0	50	11	20
		$P = 0.056$		$P = 0.690$	
How wide (variable) have you used the TTM in health education?					
In all respects	8	12	0	5	20
In almost all respects	21	29	0	16	40
In some respects	50	59	33	58	20
Very little or not at all	21	6	67	21	20
		$P = 0.004$		$P = 0.234$	
If you have used the TTM, how often?					
To every child	4	6	0	6	0
To almost every child	35	41	17	33	40
To some children	39	47	17	39	40
To few or very few children	22	6	67	22	20
		$P = 0.019$		$P = 1.000$	

Question	All n=25 %	New program n=19 %	Routine program n=6 %	Dental hygienists n=19 %	Dental nurses N=6 %
During your working career, have you felt your work important?					
Always	40	37	50	37	50
Mostly often	60	63	50	63	50
Sometimes, seldom or never	0	0	0	0	0
		P = 0.574		*P* = 0.574	
Compared to the time before the prevention study, have you felt your work to be more meaningful now?					
More meaningful	16	21	0	5	50
Slightly more meaningful	24	32	0	26	17
No change	56	42	100	63	33
Less or not meaningful at all	4	5	0	5	0
		P = 0.056		*P* = 0.047	
During the prevention study, do you feel you have matured as a health professional?					
Yes	20	26	0	11	50
In some degree	40	47	17	42	33
Slightly	24	16	50	26	17
Very slightly or not at all	16	11	33	21	0
		P = 0.020		*P* = 0.049	
Have you got any confidence to your work from the education related to the study?					
Yes, much	4	5	0	5	0
Quite much	28	37	0	32	17
In some respect	48	47	50	47	50
Very slightly or not at all	20	10	50	16	33
		P = 0.018		*P* = 0.258	
How has the prevention study changed your opinions of your work?					
More positive	16	21	0	11	0
Slightly more positive	28	32	17	26	17
Not positive at all	56	47	83	63	50
Negative	0	0	0	0	33
		P = 0.109		*P* = 0.155	

Question	All n=25 %	New program n=19 %	Routine program n=6 %	Dental hygienists n=19 %	Dental nurses N=6 %
Have you improved the effectiveness of your work during the prevention study?					
Improvement	4	5	0	5	0
Some improvement	20	26	0	16	33
Not any change	76	58	100	79	67
Reduced	0	0	0	0	0
		P = 0.124		*P* = 0.608	
During the prevention study, has there been any change in your motivation for working?					
Increased	4	5	0	0	17
Some increase	12	16	0	5	33
Not any change	84	79	100	95	50
Reduced	0	0	0	0	0
		P = 0.231		*P* = 0.009	
During the prevention study, have you gained something new for your work?					
Yes	25	33	0	17	50
Some	29	28	33	33	17
Little	33	33	33	39	17
Very little or not at all	13	6	17	11	17
		P = 0.071		*P* = 0.331	

5.4 Results of interventions implemented with patients with periodontitis

In this current study, patient education aimed at patients with periodontitis was systematically reviewed from the point of 1) clinical outcomes, 2) self-reported self-care (Table 8) and 3) patients' evaluation of the intervention. Theoretical backgrounds of interventions are described in Table 9.

The most common clinical outcome measures were plaque (plaque index or plaque percent) and bleeding (BOP). None of the studies used clinical attachment level (CAL) as an outcome. Clinical outcomes and self-reported self-care are detailed in Paper III, Table 4.

Table 8. Clinical outcomes and self-reported self-care.

Studies	Intervention implemented	Follow-up	Outcome measured	Intervention group positive outcome	Control group positive outcome	Difference between groups
Jönsson et al. 2009	Dental hygienists	3 and 12 mos	Bleeding	+	+	Statistically significant
Jönsson et al. 2006	Dental hygienists	12–14 wk	Bleeding	+	+	ns
Glavind & Zeuner 1986	Dental hygienists	2,3 and 8 wk	Bleeding	+	+	ns
Baab & Weinstein 1986	Dental hygienists	2 and 6 wk, 3 and 6 mos	Bleeding	-	-	ns
Jönsson et al. 2006	Dental hygienists	12–14 wk	Proping depth	+	+	ns
Godard et al. 2011	Periodontists	4 wk	Plaque	+	+	Statistically significant
Philippot et al. 2005	-	4 wk	Plaque	+	+	Statistically significant
Jönsson et al. 2009	Dental hygienists	3 and 12 mos	Plaque	+	+	Statistically significant
Jönsson et al. 2006	Dental hygienists	12–14 wk	Plaque	+	+	Statistically significant
Glavind & Zeuner 1986	Dental hygienists	2,3 and 8 wk	Plaque	+	+	ns
Baab & Weinstein 1986	Dental hygienists	2 and 6 wk, 3 and 6 mos	Plaque	+	+	ns
Jönsson et al. 2006	Dental hygienists	12–14 wk	Brushing	-	-	ns
Jönsson et al. 2006	Dental hygienists	12–14 wk	Interdental cleaning	+	+	Statistically significant

Patient evaluations of the interventions were included in three of the studies (Glavind & Zeuner 1986, Godard et al. 2011, Jönsson et al. 2006). Patients in the intervention group evaluated intervention as advantageous and helpful (Glavind & Zeuner 1986), reported increased self-efficacy (Jönsson et al. 2006), and reported satisfaction about communication with the dentist (Godard et al. 2011). Patients' knowledge of periodontitis prior to educational intervention was assessed in one study (Jönsson et al. 2006). Participants recognized many of the relevant symptoms of periodontitis, but their knowledge about the causes of the disease was very poor. Participants demonstrated only limited knowledge regarding the most effective methods of addressing periodontitis. Due to the high degree of heterogeneity in the included studies, both in terms of the outcome measures and behavioral or educational methods used, it was impossible to conduct meta-analysis.

A quality assessment of the included studies was performed according to the items included in the CONSORT checklist. Quality parameter and scores are detailed in Paper III, Table 3.

Table 9. The theoretical background and essential componenets of different theories used in the included studies (Modified from original publication III).

Behavioral intervention	Theoretical background	Elements used in the intervention
Cognitive behavioral approach Jönsson et al. 2009 Philippot et al. 2005	Understanding how different factors influence health behavior • characteristics of a person • behavior of the person • environment within which the behavior is performed	Information about the symptoms of periodontitis and its causes, consequences and temporal course Effective strategies offered for managing the disease: • daily record of self-care • the effects of self-care on periodontitis symptoms.
Self-regulation theory of Leventhal Godard et al. 2011	Health behavior is determined by the person's representation of the illness. Illness representations have both cognitive and emotional aspects, which are constructed through experiences and through information received from the social environment and health professionals	Questionnaire concerning periodontal symptoms and their consequences on everyday life, performed self-care and expectations of the treatment. Sessions of motivational interviewing (based on clinician empathy, discrepancy between patients' goals and values and their current behavior, and lack of argumentation or direct confrontation), while addressing the five dimensions of Leventhal's theory
Motivational interviewing Godard et al. 2011 Jönsson et al. 2009	Client-centered directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence	Educational information based on participants' thoughts, intermediate and long-term goals and oral health status. Discussions regarding knowledge, expectations and motivation • an analysis of oral self-care • manual dexterity practice for the use of oral hygiene aids • goal setting and self-monitoring • strategies for maintaining already achieved goals
Client self-care commitment model Jönsson et al. 2006	Five domains: initiation, assessment, negotiation, commitment, and evaluation. Interactions between a client and a professional can empower clients to make decisions that will enhance their own health through commitment and compliance	Discussion about • patients' self-care methods • their own views about the disease process • their experiences of their treatments • their beliefs concerning the reasons for disease progress Demonstration and discussion of the latest periodontal status Information on oral hygiene provided as necessary.

5.5 Results of motivational interviewing

In this current study MI-based patient education was compared with prevailing education in 1) clinical outcomes and 2) self-reported self-care among patients with periodontitis.

Full-mouth bleeding on probing (BOP) decreased significantly in both groups at 3-month follow-up (Table 10). From 3 to 6 months BOP was increased slightly, but not statistically significantly. Slight increase was seen in both groups, but less in MI group. Also BOP percentage in buccal-lingual (BL) and mesial distal (MD) surfaces decreased significantly in the 3-month follow up: approximal BOP decreased by 20% in control group and 28% in MI group. Again, from 3 to 6 months BOP increased, but only slightly. There was no statistically significant difference between groups in 3- and 6-month follow-ups.

Probing pocket depth (PD) was statistically significantly better in both groups in the 3-month follow up compared to baseline (Table 11). Also, the difference between the groups was statistically significant at both 3 months and 6 months ($p< 0.01$). During the 3 to 6 months follow up only the intervention group showed statistically significant improvement ($p=0.03$) in PD.

Clinical attachment level (CAL) was measured in interdental surfaces and data are presented in Table 11. There was statistically significant ($p<0.01$) change in both groups and between the groups at the 3-month follow-up. CAL improved in intervention group by 0.371 mm and by 0.219 mm in the control group. During the 3 to 6 months follow up only the intervention group showed further significant improvement of CAL ($p=0.04$)

Patients perception of dental hygienists' interpersonal and communication skills was assessed with Comunication Assessment Tool (scale 1–5). Overall score for both groups was very good 4.19 (Table 12). In control group overall score was lightly higher than in MI group (4.22 vs. 4.16) but in practice there is no relevance. For both groups the least realized question was " Dental hygienist encouraged me to ask questions" (overall score 3.69).

In the baseline, 7 of 12 in the MI group and 6 of 12 in the control group reported that they needed to make a change in their self-care behavior. At the 3-month follow-up 7 in the MI group and 7 in the control group had made a change, and 10 of them had started interdental cleaning. At the 6-month follow-up, 8/12 in MI group had started or continued a new habit, compared to 5/12 in control group.

Table 10. Bleeding on probing (Modified from original publication IV).

	Total BOP				**Buccal & lingual BOP**				**Mesial & distal BOP**			
	Control group		**MI group**		**Control group**		**MI group**		**Control group**		**MI group**	
	per visit		per visit		per visit		per visit		per visit		per visit	
Baseline N	12		9		12		9		12		9	
Mean	36.24		48.36		32.33		43.07		40.35		53.65	
Min	14.13		20.54		9.62		10.71		6.52		24.00	
Max	62.50		89.00		51.92		84.00		75.00		94.00	
Std Dev	17.68		24.26		15.01		25.18		23.03		24.42	
Between groups *p* value[a]			ns				ns				ns	
		change		**change**		**change**		**change**		**change**		**change**
Difference BL to 3 month N*	12	12	9	9	12	12	9	9	12	12	9	9
Mean	18.33	18.01	24.24	24.12	15.87	16.46	23.18	19.90	20.80	19.55	25.31	28.35
Median		16.83		21.40		12.70		20.39		14.70		25.00
Min	4.46	0.89	8.00	12.33	1.79	-3.84	8.00	1.78	7.14	-13.05	7.14	4.35
Max	49.11	55.36	46.43	58.00	37.50	46.43	42.86	50.00	60.71	64.29	52.17	66.00
Std Dev	12.29	16.70	13.96	14.50	11.15	17.04	12.29	15.61	15.62	21.21	16.46	17.20
p value[b]		*0.0005*		*0.0039*		*0.0068*		*0.0039*		*0.0068*		*0.0039*
Difference between groups *p* value[a]			ns				ns				ns	
Difference 3 to 6 month N*	12	12	9	9	12	12	9	9	12	12	9	9
Mean	20.65	-2.32	24.72	-0.48	19.97	-4.10	22.46	0.72	21.33	-0.53	26.98	-1.68
Median		1.54		-4.79		-0.90		0.00		6.00		0.00
Min	6.52	-28.97	5.77	-24.21	1.79	-33.73	5.00	-24.04	2.00	-28.85	8.00	-26.00
Max	36.11	19.65	37.50	17.86	44.44	28.57	43.48	37.50	42.31	35.72	54.00	39.29
Std Dev	10.47	14.00	10.88	12.95	12.65	18.03	13.69	16.99	15.10	18.72	15.56	18.84
P value[b]		*ns*		*ns*		*ns*		*ns*		*ns*		*ns*
Difference between groups *P* value[a]			ns				ns				ns	

BOP = bleeding on probing percentage, N= patients ns= nonsignifcant

a) difference between groups at each visit (ANOVA)

b) change from the baseline within group (Wilcoxon rank sum test)

Table 11. Probing pocket depth and Clinical attachment level (Modified from original publication IV).

	PD				CAL			
	Control		MI group		Control		MI group	
	Per visit		*Per visit*		*Per visit*		*Per visit*	
Baseline N	1291		908		645		455	
Mean	3.19		3.39		3.33		3.70	
Min	3		3		3		3	
Max	9		10		8		10	
Std Dev	0.53		0.75		0.66		0.97	
Diff btwn groups *P* value			<.0001				<.0001	
		change		*change*		*change*		*change*
Diff BL to 3 month N	1289	1288	908	904	645	644	454	453
Mean	3.06	0.134	3.17	0.225	3.11	0.219	3.33	0.371
Min	3	-2	3	-2	3	-4	3	-3
Max	7	4	12	3	7	2	12	3
Std Dev	0.30	0.473	0.60	0.593	0.44	0.596	0.85	0.795
P value		<.0001		<.0001		<.0001		<.0001
Diff btwn groups *P* value				<.0001				<.0001
		change		*change*		*change*		*change*
Diff 3 to 6 month N	1280	1277	909	908	639	638	453	453
Mean	3.06	-0.011	3.13	0.037	3.14	0.028	3.27	0.062
Min	3	-3	3	-3	3	-4	3	- 5
Max	6	2	7	5	7	-3	10	5
Std Dev	0.31	0.312	0.46	0.496	0.52	0.488	0.75	0.738
P value		ns		0.0303		ns		0.0396
Diff btwn groups *P* value				<.0001				0.0003

N = surfaces: PD = all surfaces, CAL = interdental surfaces ns= nonsignifcant

a) difference between groups at each visit (ANOVA)

b) change from the baseline within group (Wilcoxon rank sum test)

Table 12. Patients perception of dental hygienists' interpersonal communication skills (Communication Assessment Tool) (Modified from original publication IV).

Questions	MI group n=12, mean (SD)	Control group n=12, mean (SD)	Overall mean
1. Greeted me in a way that made me feel comfortable	**4.50** (0.67)	4.45 (0.68)	4.47
2. Treated me with respect	**4.50** (0.67)	4.45 (0.53)	4.47
3. Showed interest in my ideas about my health	4.18 (0.60)	4.18 (0.87)	4.18
4. Understood my main health concerns	**4.27** (0.64)	4.09 (0.94)	4.18
5. Paid attention to me (looked at me, listened carefully)	**4.54** (0.68)	4.18 (0.87)	4.36
6. Let me talk without interruptions	4.09 (0.83)	**4.36** (0.67)	4.22
7. Gave me as much information as I wanted	4.36 (0.67)	**4.45** (0.68)	4.40
8. Talked in terms I could understand	4.09 (0.83)	**4.27** (0.78)	4.18
9. Checked to be sure I understood everything	3.83 (0.57)	**4.27** (0.64)	4.05
10. Encouraged me to ask questions	3.66 (0.88)	**3.72** (0.78)	3.69
11. Involved me in decisions as much as I wanted	3.91 (0.79)	**4.00** (0.89)	3.95
12. Discussed next steps, including any follow-up plans	3.83 (0,83)	**4.00** (0,77)	3.91
13. Showed care and concern	4.16 (0,83)	**4.18** (0,75)	4.17
14. Spent the right amount of time with me	4.08 (0.90)	**4.45** (0.68)	4.26

6 Discussion

The main findings of this four-phased study suggest to begin with that dental hygienists regard patient education as important and they seem to have the knowledge and skills for patient education in theory, but some improvements should be made so that patient education could become more effective, more patient-centered and more empowering (Paper I). Dental hygienists and dental nurses have a good attitude toward a novel patient education program based on the transtheoretical model, and training in new methods seemed to increase their motivation to promote oral health and their evidence-based knowledge, and some felt they had advanced as professionals (Paper II). The behavioral interventions aimed to improve oral health and self-care of patients with periodontitis seem to be beneficial for patient adherence and may therefore improve initial periodontal treatment success (Paper III). In the long run, patient education based on motivational interviewing seems to improve oral health and self-care of patients with periodontitis compared to professional-centered education (Paper IV).

6.1 Reliability and validity

The adequacy of the research process was examined by assessing the validity and reliability of the results. Validity is a measure of the truthfulness and accuracy of a study in relation to the phenomenon of interest. Reliability refers to the degree of consistency or accuracy with which an instrument measures the attribute it has been designed to measure (Polit & Beck 2004, Gray et al. 2017).

In first phase of a study (Paper I), before actual data gathering, the NCE© instrument (Johansson et al. 2001, 2002) was pre-tested with some dental hygienists to ensure the clarity and appropriateness of the questions. The reliability of the NCE© instrument (Johansson et al. 2001, 2002) in terms of the scale internal consistency was estimated by Cronbach's alpha coefficient, which was 0.74‑0.89 for the subscales, thus showing good reliability. The alpha coefficient was 0.76 for educational skills, 0.79 for knowledge about common oral health problems (basic 0.79, generic health 0.89, lifestyle 0.74) and 0.80 for the sum scores related to education content (bio-physiological 0.83, cognitive 0.89, experiential 0.74 and ethical 0.77).

The phase I response rate was 53%, which is satisfactory (Gray et al. 2017) because the questionnaire was relatively long and participants had to mail it back to the researcher (postage was already paid). We have no information on the reasons for non-participation: a dropout analysis was not performed because of the anonymity. However, the dental hygienists who participated in the study might have been more interested in patient education than those who did not. Furthermore, the contact information for dental hygienists was taken from the membership list of the Finnish Dental Hygienist Association and it is possible that not all information was correct, so perhaps not everyone in the target group received the questionnaire. Those who participated seemed not to have any difficulty in understanding or answering the questions. Only 7 of 222 respondents commented that there was some question which they considered irrelevant (e.g. education on the financial dimension). In the cover letter was also the researchers' contact information in case of the need for additional information.

The phase II (Paper II) questionnaire was designed in cooperation with a dentist (responsible for the larger study in City of Vantaa) and two dental hygienists, MNSc. Criterion validity was not examined in the absence of an instrument with which the current questionnaire could have been compared. The questionnaire was piloted before launch with two dental hygienists comparable to the target group. Some amendments were made in order to make questions less ambiguous, and new choices added when necessary. In phase II the response rate was very high (89%). In a community-based study with about 30 dental professionals delivering counseling, the results are not as comparable as when only a few professionals deliver counseling to the families. Therefore, the results of the present study are close to the reality in any public dental service.

In systematic review (Paper III) the international database MEDLINE was used to find the relevant literature. Validity of studies included in the systematic review was assessed through CONSORT (Moher et al. 2001). It includes assessment of validity (e.g. randomization, instruments used) and external validity (e.g. generalizability). Content validity was confirmed by an extensive review of all literature. In the systematic review phase, agreement between three researchers' analyses of scope, methodology and impacts of patient education studies were not tested by any statistical methods. Agreement was reached through debate and discussion. Due to the high degree of heterogeneity in the included studies, both in terms of the outcome measures and behavioral or educational methods used, it was impossible to conduct meta-analysis.

The instrument used in phase IV (Paper IV) was the communication assessment tool (CAT) (Makoul et al. 2007). It was designed to be used by patients to assess the interpersonal and communication skills of physicians, and it can be assumed to be valid for the purposes of this study. The English version of CAT was translated into

Finnish by a sworn translator and the questionnaire was tested for five people to ensure the clarity and appropriateness of the questions. The reliability of the communication assessment tool in terms of the scale internal consistency was estimated by Cronbach's alpha coefficient, which was 0.88, showing good reliability.

In the phase IV clinical data collection (BOP, PD, CAL) reliability was ensured, because one experienced dentist, a specialist in periodontology, carried out all clinical measurements. Dentist did not know which group the patient was randomized. In follow-up visits there was no information about previous clinical measurements.

Before starting the data collection, our aim was 100 participants. It was assumed, based on the prevalence of periodontitis and the amount and type of patients, that an adequate number of patients would be recruited in three to four weeks. However, after over a year only twenty-four patients wrere recruited. At that point, the recruitment was closed. It was calculated that with this amount of patients, it was possible to have tentative and representative results on the effectiveness of the intervention.

6.2 Patient education by dental hygienists and dental nurses and the effect of training in new methods

The dental professionals, the dental hygienists and in-service trained dental nurses, were responsible for oral health promotion and patient education in this study. Both professionals regard patient education as a meaningful and primary part of their work (Paper I, II). The dental hygienists assessed their own educational skills as fairly good in assessing the patient's knowledge and expectations, setting learning objectives, evaluating learning outcomes, mastering the content of patient education, using different educational methods and mastering the interaction with the patient. However, it seems that assessing, goal setting and evaluating are implemented professional-centered and the standpoint of the patient was disregarded (Paper I). Patients, too, asserted that dental hygienists should encourage patients to ask more questions and involve them in decision-making (Paper IV). Methods used were traditional: telling and advice giving; in many cases dental hygienists provided this kind of education while they were treating the patient (Paper I).

Findings from this study affirm previous studies: the practical implementation of counseling, even after training in TTM and/or MI, can be difficult (Kasila et al. 2003, 2006, Curry-Chiu et al. 2015). It is important for dental professionals to note that merely providing information for the patient does not produce long-term changes in behavior (Watt et al. 2001). Viewed from the perspective of empowerment, TTM

and MI patients can be seen as collaborators in their care (Miller & Rollnick 2002, Poskiparta et al. 2001). Their expectations, knowledge, experiences, motivation, perceptions, preferences and participation should therefore be taken into consideration more because these affect the patients' motivation to make a change. However, dental hygienists' assessment of their interaction with patients hit the nail on the head (Paper I): patients evaluate dental hygienists' interpersonal and communication skills as very good, regardless of the patient education method used (Paper IV).

As assessed by the dental hygienists, there was room for improvement in the use of different educational methods (Paper I). This study contained training in new patient education methods in two phases (II, IV). In phase II dental hygienists and dental nurses were trained to use the transtheoretical model in promoting health for young children (Paper II), and in phase IV dental hygienists were trained to use motivational interviewing with patients with periodontitis (Paper IV). After training and implementing the new program, dental hygienists and dental nurses answered that they felt health promotion to be even more meaningful than before. They also assessed that training increased their evidence-based knowledge of oral health, and it may result in better oral health for children. Especially those with less prior experience felt that they had advanced as professionals and gained confidence in their work (Paper II). Studies of nurses (Bergh et al. 2014), dental hygienists (Curry-Chiu et al. 2015), and dental hygiene students (Croffoot et al. 2010) have shown similar findings. In this study dental nurses reported more improvement in work than dental hygienists. This may be due to new responsibilities given. Dental nurses were eager to work independently with children and their families.

Training in both phases was in-service training: phase II one-day and phase IV half-day training. Training seems to have some effect on dental professionals' implementation of patient education; even time for training in the behavioral-based method was very short (Paper II, IV). This is in line with previous research on medical and dental students, which pointed out that an 8-hour training of MI led to superior performance on MI, especially for "empathy" and "MI spirit" (Daeppen et al. 2012, Woelber et al. 2016). In phase IV there was quite a long time from the first patient to the last, so it might have been challenging for a dental hygienist in the MI group to carry out a novel method, though it seems that the dental hygienists performed well. It is said, however, that profound use of MI requires training and ongoing practice from professionals (Miller & Rollnick 2009) so as not to revert to old education habits (Miller & Mount 2001).

The educational skills and patient education practices of the dental hygienists were based mainly on experience, but rarely on research evidence (Paper I). According to results of this study (phases II, IV) and previous research, there is a

place for in-service training about patient education methods, but also utilization of scientific journals or databases.

6.3 The effect of patient education interventions

The clinical outcome measures that were used in the studies of systematic review (Paper III) mainly described the state of oral hygiene (plaque) and gingival inflammation (bleeding), not the state or progression of periodontitis, with the exception of one study (Jönsson et al. 2006). This can be seen as a limitation because the focus in the studies was periodontitis. Therefore, in phase IV we also measured probing pocket depth and clinical attachment level (Paper IV).

Consistently, studies using behavioral methods showed significantly improved plaque control in the intervention group compared to the control. Bleeding decreased in all groups and no significant differences were found (Paper III). In our RCT study (Paper IV) results were quite similar; bleeding decreased in both MI and control groups at the 3-month follow-up and seemed to stay stable slighly better in MI group from 3-6 months. However, bleeding increased less in the MI group in the 3- to 6-month follow-up, so it seems that MI-based education is effective in the long run. Furthermore, significant differences were found between groups in PD and CAL measurements in the 6-month follow-up in favour to MI group (Paper IV). In systematic review one study (Jönsson et al. 2006) showed a statistically significant reduction in the number of >4mm pockets 3 months after treatment in the intervention group which is in agreement with our RCT study. However, this outcome should not be regarded solely as an effect of the behavioral approach. Scaling and root planing were used in the beginning of that study as well as in our study, and patient`s self-care interventions were an additional but essential part of the treatment response. It is clear, that periodontitis cannot be treated only by self-care, but based on the phase IV study, it can be suggested that patients in the MI group have succeeded in long-term self-care better than patients in the control group. However, the groups were small and differences between the groups were minor and therefore this result is tentative.

Another outcome in systematic review was self-reported self-care. Behavioral approaches were not able to increase the frequency of tooth brushing. It is noteworthy that almost all the examined patients already brushed their teeth twice a day. However, behavioral approaches did appear to be more effective in increasing the frequency of interdental cleaning than traditional methods (Paper III). Increasing the frequency of interdental cleaning is very important in obtaining adequate management of periodontitis. A similar effect was found in our randomized controlled trial: in the MI group 7 of 12 who started interdental cleaning at the beginning continued it at the 6-month follow up, compared to 5 of 12 in the control

group (Paper IV). In interventions based on patient education there is always a possibility of confounding factors, for example differences in intervention and control groups. Therefore, it is challenging to point out, if changes are the result from intervention or due chance.

In the review paper (III) a higher proportion of individuals in the intervention group estimated that they were able to perform oral self-care effectively compared to the control group. Participants in the intervention group also reported daily compliance with the skills they were taught, and they estimated a higher likelihood of maintaining their new habits than the participants in the control group. Patient evaluations revealed that behavioral interventions resulted in better understanding of the disease process than control interventions, and a written commitment positively influenced their self-care habits (Paper III). In our RCT study patients' perception of dental hygienists' interpersonal and communication skills was assessed in both groups as very good. The dental hygienists in the control group were assessed as slightly better in communication. According to this, a professional with good communication skills is experienced as pleasing, no matter what kind of educational method is used. On the other hand, a professional with less facility for communication can use the principles of MI as a communication tool. For both groups, MI and control, the least realized question was, "Dental hygienist encouraged me to ask questions." By encouraging patients to ask, there would be great opportunity to engage the patient in treatment and self-care. At the same time, there is the possibility for the professional to learn more about the patient's needs, values and knowledge.

Systematic review (Paper III) indicated that follow-up times for studies were rather short. Some researchers suggest as long as several years' follow-up times (Preus et al. 2017). However, we were interested also in the initial behavioral change of patients and therefore short time studies were included. Short time follow-up studies have the potential to show behavioral change that can benefit the initial anti-infective treatment phase. One previous systematic review (Gao et al. 2014) noted that in the studies which reported the absence of the superior effects of MI, the follow-up periods were relatively longer (6 and 12 months) than in other studies. Our RCT study (Paper IV) pointed to the opposite: it seems that in a long run (6-month follow-up), patient education based on MI seems to improve oral health and self-care of patients with periodontitis compared to professional-centered education.

6.4 General discussion

The starting point to this study was the need to explore how to support the oral health and oral self-care of patients, especially those with periodontitis. The first phase of the study confirmed the presumption: based on the answers of 222 dental hygienists,

it was concluded that there is a place to enhance patient-centered education. The theoretical background for empowerment runs through the whole study, but more concrete ways (specific tools) to support patients' empowerment were researched. In the second phase, the tool was the transtheoretical model, which was taught to dental hygienists and dental nurses. The new method was widely accepted among dental professionals, and they think that they have advanced as health professionals. These results and outcomes of systematic review (phase three) lay the groundwork for a randomized controlled clinical trial. The aim of the fourth phase of this study was to evaluate the potential additive effect of MI in gingival health and self-care. Patients' experiences of communication with dental hygienists were also investigated.

It can be discussed if some other study design would have been suitable. A case study could have been one option. The phenomenon of patient education implemented by dental hygienists could have been studied from different viewpoints. Also, the viewpoint of the patients could have been studied more. Based on this study, we now know MI-based education's effect on gingival health and self-care and how patients assessed dental hygienists' communication skills. The viewpoint of the patients could also have been studied: their expectations and learning needs and whether education increased their knowledge.

The use of only one database in systematic review (phase III) could be questioned. According to some research, MEDLINE should be regarded as the first choice (Brazier & Begley 1996); some suggests MEDLINE and CINAHL (Subirana et al. 2005), and some only CINAHL (Wright et al. 2015). Therefore, the literature search was later repeated with MEDLINE, CINAHL and Cochrane. The search did not reveal new studies which could have changed the results of the systematic review.

In this study the concept of self-care was used. It could be questioned why the concept of self-management was not used instead. Self-management has become a popular term for behavioral interventions. This is especially true for the management of chronic conditions. In this study, self-care was used to mean tooth brushing and interdental cleaning—procedures by which a person can reduce plaque and maintain a satisfactory oral hygiene status. The concept of self-management is much broader. There are five core self-management skills: problem solving, decision making, resource utilization, forming a patient-health care provider partnership, and taking action (Lorig & Holman 2003). Self-care is one part of self-management; it is taking action.

To have good self-management skills is quite equal with the outcome of empowerment, which is one concept used in this study. The empowering process and empowerment as an outcome were aimed at the mastery of a person's own life. Patients are empowered when they have knowledge that meets their needs to make

rational decisions, sufficient control and resources to implement their decisions, and adequate experience to evaluate the effectiveness of the choices (Feste & Anderson 1995; Funnell & Anderson 2003; Johansson 2006). An empowered patient also puts this knowledge into practice (Funnelle et al. 1991), in this case, with proper oral self-care.

Another concept very close to empowerment and self-management is self-efficacy. It refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura 1977). People with high self-efficacy are more likely to make efforts to complete a task and to persist longer in those efforts than those with low self-efficacy (Schunk 1990). Choices affecting health are dependent on self-efficacy. With increased self-efficacy, individuals have greater confidence in their ability and thus are more likely to engage in healthy behaviors. Greater engagement in healthy behaviors results in positive patient health outcomes, such as improved quality of life (Conner 2005).

In phase IV we were interested in how patients assess dental hygienists' interpersonal and communication skills, which are a core competency for all health care professionals. We wanted to know if there was there any difference between patients' assessments depending on the group. Do patients assess dental hygienists in the MI group higher because education in this group in patient-centered? Are dental hygienists in the control group superior for some other reason? To study this, the communication assessment tool (CAT) was used (Makoul et al. 2007). The CAT tool was chosen because it was developed for this purpose only: to assess patients' perceptions.

It would also have been possible to study how dental hygienists implemented MI-based education in the intervention group. There are some tools for the evaluation of MI skills. For example, the Motivational Interviewing Treatment Integrity Scale (MITI) involves two components, a global score describing an overall impression of a particular area and a behavior count, which is an actual tally of certain behaviors (Moyers et al. 2005). The Motivational Interviewing Skills Code (MISC) assesses both the patient and the professional with a focus on change talk (Miller 2008). The Motivational Interviewing Supervision and Training Scale (MISTS) assesses the quality of the treatment as well as a behavioral count of skills (professional's responses) consistent with MI (Madson et al. 2005). An overarching element of these tools is that they all require direct observation, or at least audio recordings, by the reviewer.

7 Conclusion

The present four-phased study set out to analyze dental patient education from the behavioral education point of view. More specifically, the aim of this study was to explore how to support the oral health and oral self-care of patients with periodontitis. To reach that aim, patient education methods and behavioral and educational interventions used in oral health care, especially with patients suffering from periodontitis, were evaluated and tested for effectiveness. Based on the results of this study the following conclusions are drawn:

- Dental hygienists regard patient education as an important and essential part of their work. They seem to have the knowledge and skills for patient education in theory, but some improvements should be made so that patient education could become more effective, more patient-centered and more empowering. The dental hygienists assessed that there was room for improvement in the use of different educational methods. (Paper I)
- Dental hygienists' patient education focuses on functional matters (e.g. brushing) and cognitive aspects (e.g. knowledge of oral illness). (Paper I)
- The majority of dental hygienists and in-service dental nurses accepted the novel oral health programs well. They gained confidence through training and new practices for their work. (Paper II)
- The behavioral interventions seem to improve the outcomes of oral health and self-care in periodontitis patients. (Paper III)
- The behavioral interventions especially increase interdental cleaning. (Paper III, IV)
- In the long run, patient education based on motivational interviewing seems to improve periodontal health and self-care of patients with periodontitis compared to professional-centered education. (Paper IV)
- Dental hygienists have good communication skills regardless of the method used. (Paper IV)

7.1 Challenges for practice and education

- The assessment of patients' educational needs, skills, knowledge, level of motivation and values should be included in patient education practices.
- Dental hygienists' and dental nurses' skills and knowledge should be updated through continuing training, so they properly understand the idea of patient-centered, behavioral and empowering patient education.
- Empowering, behavioral-based education should be incorporated into basic education of dental hygienists and dental nurses.
- Professionals should have faith in patients: they do have knowledge, they are able to make a change and foster their health, sometimes with a little help from professionals.

7.2 Suggestions for further research

- The perspective of the patients should be analyzed more widely, with a qualitative study, and in that way, the picture of patient education would be complemented.
- A randomized controlled trial (Paper IV) should be repeated with a large sample size. More evidence is needed on the impacts of motivational interviewing on patients with periodontitis.
- Implementation of motivational interviewing in dental hygienists' work should be assessed via observation.
- More practice-based research, which can easily be implemented in practice, is needed to change the practice of patient education in the oral health care field.
- The use of artificial intelligence in behavioral patient education should be tested

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Appendices

Appendices are in Finnish.

Appendix 1. Invitation and information about the study (phase I)
Appendix 2. Nursing Center of Excellence NCE© / Empowering Patient Education from the point of view Nurses EPNURSE (phase I)
Appendix 3. Questionnaires for the dental professionals in groups F, X and C after children's first visits (phase II)
Appendix 4. Invitation and information about the study (phase IV)
Appendix 5. Informed consent (phase IV)
Appendix 6. Information for dentist (phase IV)
Appendix 7. Clinical examination form (phase IV)
Appendix 8. Oral self-care questionnaire (phase IV).
Appendix 9. Communication assessment tool CAT© (phase IV)

Appendix 1. The invitation to the study (phase I).

Hyvä suuhygienisti,

Teen pro gradu -tutkielmaa Turun yliopiston hoitotieteen laitoksella. Tutkimuksen tarkoituksena on kuvata potilasohjauksen toteutumista suuhygienistin työssä. Kyselylomakkeessa käytetään potilasopetus-termiä, jolla tarkoitetaan asiakkaan tai potilaan opetusta, ohjausta ja neuvontaa. Tämän kyselyn tarkoituksena on selvittää, mitä suuhygienistin toteuttama potilasopetus sisältää sekä miten ja missä potilasopetusta toteutetaan. Lisäksi tarkoitus on selvittää, miten suuhygienistit suhtautuvat potilasopetukseen ja mitkä asiat suuhygienistien mielestä edistävät tai estävät potilasopetuksen toteutumista. Sinut on valittu kyselyn vastaanottajaksi Suuhygienistiliiton jäsenrekisteristä systemaattisen otannan avulla.

Pyydän Sinua ystävällisesti vastaamaan lomakkeessa esitettyihin kysymyksiin omien mielipiteidesi, näkemyksiesi ja toimintatapojesi mukaan. Kysymyksiin ei ole olemassa oikeita tai toivottuja vastauksia. Vastaaminen vie noin puoli tuntia aikaasi. Kaikki vastaukset käsitellään luottamuksellisesti, eikä henkilöllisyytesi tule esille missään tutkimuksen vaiheessa. Kyselomakkeet hävitetään tutkimuksen raportoinnin jälkeen. Kyselyyn osallistuminen on vapaaehtoista, mutta vastaamalla kyselyyn annat arvokasta tietoa suuhygienistin työstä. Vastattuasi kaikkiin kysymyksiin, palauta lomake ohessa tulleessa palautuskuoressa. Postimaksu on maksettu valmiiksi, samoin palautusosoite on valmiina palautuskuoressa. **Pyydän Sinua palauttamaan kyselylomakkeen 30.3.07 mennessä.** Palauta lomake myös siinä tapauksessa, että et halua osallistua tutkimukseen. Vastaa silloin kuitenkin ystävällisesti kysymyksiin 1–6.

Tutkimustani ohjaavat Hoitotieteen valtakunnallisen tutkijakoulun koordinaattori, TtT Kirsi Johansson (puh. 02-333 8455) ja professori (ma), TtT Sanna Salanterä (puh. 02-333 8414) Turun yliopiston hoitotieteen laitokselta. Tutkimus julkaistaan pro gradu -tutkielman valmistumisen jälkeen Suuhygienisti-lehdessä. Vastaan mielelläni mahdollisiin tutkimustani koskeviin kysymyksiin.
Etukäteen avustasi kiittäen,

Mirkka Rantanen,
Terveystieteiden maisteri-opiskelija, suuhygienisti
Turun yliopisto, Hoitotieteen laitos
miinra@utu.fi, 050572729

Appendix 2. NCE.

Ole hyvä ja vastaa kysymyksiin ympyröimällä mielestäsi sopivin vastausvaihtoehto tai kirjoittamalla vastaus siihen varattuun tilaan.

1. Ammattitutkintosi (mainitse vain ylin)_____tutkinto vuonna_____

2. Ikäsi _____vuotta

3. Montako vuotta olet työskennellyt terveydenhuollossa tutkinnon suorittamisen jälkeen?

_____vuotta

4. Montako vuotta olet työskennellyt nykyisessä työyksikössäsi?

_____vuotta

5. Oletko
1 vakinaisessa työsuhteessa
2 sijainen
3 yrittäjä/ ammatinharjoittaja
4 muussa, kuin suuhygienistin työssä

6. Missä tällä hetkellä työskentelet?

1 terveyskeskuksessa/ terveysasemalla
2 yksityisellä vastaanotolla
3 muualla, missä_____

7. Ovatko asiakkaasi
1 enimmäkseen aikuisia (>18 v.)
2 enimmäkseen lapsia (< 18 v.)
3 molempia

8. Miten kuormittavaksi koet työyksikkösi fyysisesti
1 erittäin kuormittavaksi
2 jonkin verran kuormittavaksi
3 vähän kuormittavaksi
4 ei lainkaan kuormittavaksi

9. Miten kuormittavaksi koet työyksikkösi psyykkisesti
1 erittäin kuormittavaksi
2 jonkin verran kuormittavaksi
3 vähän kuormittavaksi
4 ei lainkaan kuormittavaksi

10. Miten paljon kiire haittaa työskentelyäsi
1 erittäin paljon
2 melko paljon
3 melko vähän
4 ei lainkaan

11. Miten paljon työhösi kuuluu potilasopetusta
1 opetan kaikkia potilaita
2 opetan useita potilaita
3 opetan joitakin potilaita
4 en opeta ollenkaan

12. Miten tärkeänä pidät potilasopetusta hoitotyössä

1 hyvin tärkeänä
2 melko tärkeänä
3 ei kovin tärkeänä
4 ei lainkaan tärkeänä

13. Millaiset potilasopetustaidot Sinulla on omasta mielestäsi

	Hyvät	Melko	Melko hyvät	Huonot huonot
1. potilaan oppimistarpeen määrittelyssä	1	2	3	4
2. potilasopetuksen tavoitteiden määrittelyssä	1	2	3	4
3. potilasopetuksen sisällön hallinnassa	1	2	3	4
4. potilasopetuksen eri toteutusmenetelmien hallinnassa	1	2	3	4
5. potilaan oppimisen arvioinnissa	1	2	3	4
6. vuorovaikutustaidoissa	1	2	3	4

14. Millaiset tiedot Sinulla on omasta mielestäsi

	Hyvät	Melko hyvät	Melko huonot	Huonot
1. suun kotihoitovälineistä ja -tuotteista	1	2	3	4
2. kuivan suun hoidoista	1	2	3	4
3. vihlovien hampaiden hoidoista	1	2	3	4
4. halitoosin hoidoista	1	2	3	4
5. purentavirheiden hoidoista	1	2	3	4
6. proteesien ja implanttien hoidoista	1	2	3	4
7. syömishäiriöiden vaikutuksista suun terveyteen	1	2	3	4
8. erityisruokavalioiden vaikutuksista suun terveyteen	1	2	3	4
9. yleissairauksien vaikutuksista suun terveyteen	1	2	3	4
10. lääkkeiden vaikutuksista suun terveyteen	1	2	3	4
11. tupakoinnin/nuuskan vaikutuksista suun terveyteen	1	2	3	4
12. tupakoinnin lopettamisen tukitoimista	1	2	3	4
13. suun alueen lävistysten hoidosta	1	2	3	4
14. karieksen syistä, ehkäisystä ja hoidosta	1	2	3	4
15. parodontiitin syistä, ehkäisystä ja hoidosta	1	2	3	4

15. Mitkä ovat mielestäsi omat vahvat alueesi potilasopetuksessa?

_____

_____

16. Mitkä ovat mielestäsi kehitettäviä alueita omissa potilasopetustaidoissasi?

1. Miten paljon potilasopetustaitosi perustuvat
2.

		Erittäin paljon	Melko paljon	Melko vähän	Ei lainkaan
1.	peruskoulutukseesi	1	2	3	4
2.	lisä- tai täydennyskoulutukseesi	1	2	3	4
	Itsenäiseen opiskeluun / tiedonhakuun	1	2	3	4
3.	ammattilehtien (esim. suuhygienisti-lehti) artikkeleihin	1	2	3	4
4.	työkokemukseesi	1	2	3	4

18. Miten paljon toteuttamasi potilasopetus perustuu

		Erittäin paljon	Melko paljon	Melko vähän	Ei lainkaan
5.	tutkimustuloksiin kotimaisista tieteel-lisistä julkaisusta	1	2	3	4
6.	tutkimustuloksiin ulkomaisista tieteel-lisistä julkaisuista	1	2	3	4
7.	tutkimustuloksiin erilaisista tieteellisistä tietokannoista	1	2	3	4
8.	ammattilehtien (esim. suuhygienisti-lehti) artikkeleihin	1	2	3	4
9.	työpaikan potilasopetuskäytäntöihin	1	2	3	4
10.	omaan työkokemukseesi potilasopetuksen toteuttamisesta	1	2	3	4

19. Mitkä asiat mielestäsi edistävät Sinua toteuttamaan potilasopetusta?

20. Mitkä asiat mielestäsi estävät tai haittaavat Sinua potilasopetuksen toteuttamisessa?

21. Millaiset mahdollisuudet Sinulla on kehittää potilasopetusta työyksikössäsi?

1 hyvät
2 melko hyvät
3 melko huonot
4 huonot

22. Kuvaile lyhyesti, miten potilasopetusta on kehitetty työyksikössäsi?

_____

_____

_____

_____

23. Oletko työyksikössäsi nimetty jonkun opetusalueen vastuuhoitajaksi?

1 kyllä, minkä_____
2 en

24. Miten arvioit potilaan oppimistarpeen. Ympyröi sopiva vastausvaihtoehto <u>jokaisesta</u> kohdasta.

		Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
1.	Arvioin potilaan opimistarpeen	1	2	3	4
	Miten				
2.	Haastattelen etukäteen tekemäni suunnitelman mukaan	1	2	3	4
3.	Haastattelen vapaamuotoisesti	1	2	3	4
4.	Käytän kirjallista kyselya tai testiä	1	2	3	4
5.	Jollakin muukka tavalla, millä	1	2	3	4

25. Miten asetat tavoitteet potilasopetukselle? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Asetan tavoitteet potilasohjaukselle	1	2	3	4
Miten				
Kerron potilaalle selvästi opetuksen tavoitteet	1	2	3	4
Annan potilaan kertoa oman käsityksensä opetuksen tavoitteista	1	2	3	4
Keskustelen tavoitteista yhdessä potilaan kanssa	1	2	3	4
Jollakin muulla tavalla, millä	1	2	3	4

26. Mitä tavoitteita asetat potilasopetukselle? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Asetan tavoitteeksi tiedon saannin	1	2	3	4
Asetan tavoitteeksi taidon oppimisen	1	2	3	4
Asetan emotionaalisisa tavoitteita (esim. Turvallisuuteen liittyviä)	1	2	3	4
Asetan muita tavoitteita, mitä	1	2	3	4

27. Kuvaile esimerkkejä antamalla, millaisia tavoitteita asetat?

_____

_____

_____

_____

28. Mitä asioita opetat potilaalle? Seuraavassa on lueteltu asioita, joita potilasopetuksessa voidaan käsitellä. Ympyröi jokaisesta kohdasta se vastausvaihtoehto, joka parhaiten vastaa Sinun toteuttamaasi potilasopetuksen sisältöä.

Opetan	**Kaikkien potilaiden kohdalla**	**Useiden potilaiden kohdalla**	**Harvojen potilaiden kohdalla**	**En kenenkään potilaan kohdalla**
millaisia fyysisiä oireita ja tuntemuksi potilaan tutkimuksiin/sairauteen/hoitoihin liittyy (esim. kipu)	1	2	3	4
miten oireiden ja tuntemuksien tuomat ongelmat tunnistetaan	1	2	3	4
miten potilas selviytyy oireiden ja tuntemuksien tuomista ongelmista (esim. lääkityksen, levon avulla)	1	2	3	4
miten potilas voi itse edistää tutkimuksestaan/ sairaudestaan/hoidoistaan selviytymistä (esim. kotihoidosta huolehtimalla)	1	2	3	4
mitä potilaan tutkimukset ovat	1	2	3	4
mitä potilaan sairaus on	1	2	3	4
mitä potilaan hoito on	1	2	3	4
miten potilaan tutkimukset toteutuvat	1	2	3	4
miten potilaan hoito toteutuu	1	2	3	4
millaisia mahdollisuuksia ja vaihtoehtoja potilaan tutkimuksilla on	1	2	3	4
millaisia mahdollisuuksia ja vaihtoehtoja potilaan hoidoilla on	1	2	3	4
mitä potilaan jatkohoito sisältää	1	2	3	4
mistä potilas saa lisätietoa tutkimuksestaan/ sairaudestaan/hoidoistaan	1	2	3	4
miten potilaan aikaisempia kokemuksia voidaan hyödyntää	1	2	3	4
niitä asioita, joista potilas esittää toiveitansa ja odotuksiansa	1	2	3	4
miten potilas voi tunnistaa tunteitaan tutkimustaan/sairauttaan/hoitojaan kohtaan	1	2	3	4
miten potilas selviytyy omien tunteidensa käsittelystä	1	2	3	4
miten potilaan elämäntapa voidaan huomioida tutkimuksen/sairauden/hoitojen suhteen	1	2	3	4

millaisia oikeuksia potilaalla on tutkimuksien ja hoitojen suhteen (esim. oikeus tehdä valintoja	1	2	3	4
miten potilas selviytyy tutkimuksesta/sairaudesta/hoidoista ja niihin liittyvistä ongelmista taloudellisesti (esim. korvaukset)	1	2	3	4

29. Mitä muita asioita opetat potilaalle, joita ei edellä olevissa kohdissa ollut? Ole hyvä ja perustele vastauksesi.

_____

_____

30. Oliko edellä olevissa kohdissa asioita, joita pidät turhina opettaa potilaalle? Ole hyvä ja perustele vastauksesi.

_____

_____

31. Millä menetelmillä opetat? Ympyröi sopiva vastausvaihtoehto <u>jokaisesta</u> kohdasta.

Opetan	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Henkilökohtaisesti	1	2	3	4
Potilaita ryhmässä	1	2	3	4
Kertomalla opetuksen tavoitteista	1	2	3	4
Keskustelemalla	1	2	3	4
Antanalla kirjallista materiaalia	1	2	3	4
Näyttämällä opetusvideon	1	2	3	4
Näyttämällä hoitovälineitä	1	2	3	4
Näyttämällä miten asia tehdään	1	2	3	4
Tietokonetta apuna käyttäen	1	2	3	4
Muulla tapaa, miten	1	2	3	4

32. Jos vastasit edellisessä kysymyksessä käyttäväsi opetuksessasi kirjallista materiaalia, opetusvideota tai tietokonetta, niin tarkenna millaista materiaalia käytät. Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Työpaikan omia materiaaleja	1	2	3	4
Internetistä saatavia potilasohjeita	1	2	3	4
Potilasyhdistysten materiaaleja	1	2	3	4
Kaupallisia materiaaleja	1	2	3	4
Tieteellisiä julkaisuja	1	2	3	4
Muuta materiaalia, mitä	1	2	3	4

33. Milloin opetat potilasta? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

Opetan	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Potilasta heti hänen saavuttua vastaanotolle	1	2	3	4
Potilasta hänen jatkohoitoon / kotiin lähtiessä	1	2	3	4
Potilasta hoitotoimenpiteen yhteydessä	1	2	3	4
Muuna aikana	1	2	3	4

34. Kuinka usein opetat potilasta? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

Opetan	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Yhden kerran hoitojakson aikana	1	2	3	4
Hoitojakson ensimmäisellä ja viimeisellä kerralla	1	2	3	4
Kaikilla käynneillä	1	2	3	4

35. Kuinka paljon käytät aikaa keskimäärin potilasopetukseen?

1 melkein koko työaikani
2 yli puolet työajastani
3 alle puolet työajastani
4 hyvin vähän työajastani

36. Kuinka paljon käytät aikaa keskimäärin yhden potilaan opetukseen?

1 yli 20 minuuttia/opetuskerta
2 noin 10-20 minuuttia/opetuskerta
3 noin 5-10 minuuttia/opetuskerta
4 alle 5 minuuttia/opetuskerta

37. Missä opetat potilasta? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

Opetan	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Hoitohuoneessa vastaanotolle	1	2	3	4
Erillisessä ohjaushuoneessa	1	2	3	4
Yleisessä tilassa	1	2	3	4
Jossain muualla	1	2	3	4

38. Onko työyksikössäsi asianmukaiset tilat potilasopetuksen toteuttamiselle?

1 kyllä on, millaiset _____

2 ei ole, puutteita ovat: _____

39. Miten arvioit sitä, miten potilas on ymmärtänyt tai oppinut opetetun asian? Ympyröi sopiva vastausvaihtoehto jokaisesta kohdasta.

	Kaikkien potilaiden kohdalla	Useiden potilaiden kohdalla	Harvojen potilaiden kohdalla	En kenenkään potilaan kohdalla
Arvioin potilaan oppimista **Miten**	1	2	3	4
Haastattelen etukäteen tekemäni suunnitelman mukaan	1	2	3	4
Haastattelen vapaamuotoisesti	1	2	3	4
Käytän kirjllista kyselyä tai testiä	1	2	3	4
Arvioin potilaan tekemän suorituksen	1	2	3	4
Pyydän potilasta arvioimaan itseään suullisesti	1	2	3	4
Pyydän potilasta arvioimaan itseään kirjallisesti	1	2	3	4
Jollakin muulla tapaa, millä	1	2	3	4

40. Kuvaile mielestäsi tämänhetkiset keskeiset ongelmat potilasopetuksessa omassa työyksikössäsi.

_____

41. Millaisia ehdotuksia Sinulla on edellä esittämiesi potilasopetuksessa ilmenevien ongelmien ratkaisemiseksi?

_____

_____

Appendix 3. Questionnaires for the dental professionals in groups F, X and C after children's first visits

Kysely ryhmän F suorittajille

Ympyröi valitsemasi vaihtoehto, voit lisäksi kirjoittaa vapaasti kysymysten jälkeen oleville riveille.

Suorittajaa koskevia tietoja

A Ammattinimike

suuhygienisti	hammashoitaja

B Suorittajan ikä

vuotta

C Kokemus alle kouluikäisten lasten terveysneuvonnasta?

kuukautta/vuotta

1 Ajan varaaminen v.2008 syntyneen ensikäynneille

A Kuinka pitkä aika lasten ensikäynneille on tavallisesti varattu?

20 min	30 min	40 min	45 min	50 min	60 min

B Onko ajan pituus ollut toivomustesi mukainen?

aina	useimmiten	joskus	harvoin	ei koskaan

2 Ensikäyntiin liittyvät ohjeet ja -materiaali

A Mitä mieltä olet ennakko-ohjeiden soveltumisesta terveysneuvontaan

soveltuvat erittäin hyvin	soveltuvat kohtalaisesti	en osaa sanoa	soveltuvat huonosti	eivät sovellu neuvontaan

B Miten hammasvälien puhdistuskansio on toiminut neuvonnassa?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten esitteet ja materiaalit ovat soveltuneet neuvontaan?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

3 v. 2008 syntyneen ensikäynti

A Onko terveystarkastuksessa ollut käytössä hammashoitotuoli?

aina	useimmiten	joskus	harvoin	ei koskaan

B Kuinka olet pystynyt noudattamaan ohjeita?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten vanhemmat ovat suhtautuneet hampaiden puhdistusopetukseen?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

D Kuinka usein huoltaja on saanut puhdistusopetuksen

aina	useimmiten	joskus	harvoin	ei koskaan

E Onko sinulla ollut toisen tutkimusalueen v. 2008 syntyneitä lapsia ensikäynnillä?

kyllä	ei

F jos on ollut, minkä ryhmän?

on ollut X	ei ole ollut X
on ollut C	ei ole ollut C

G Osasitko tai osaisitko antaa neuvontaa toisen ryhmän mallin mukaan?

kyllä osaisin X	en osaa sanoa X	en osaisi X
kyllä osaisin C	en osaa sanoa C	en osaisi C

4 Käynti ja sen kirjaaminen WinHit-ohjelmaan

A Kuinka monta minuuttia käyntiin ja kirjaukseen on yleensä kulunut?

≤ 20	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56–60	≥ 60

B Onko käyntiin varattu aika aina riittänyt neuvontaan ja kirjaamiseen?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Oletko käyttänyt valmiiksi kirjoitettuja profiilitekstejä?

aina	useimmiten	joskus	harvoin	en koskaan

5 Suorittajan kokemukset tutkimuksesta

A Oletko kokenut tekeväsi hyödyllistä työtä työurasi aikana?

aina	useimmiten	joskus	harvoin	en koskaan

B Oletko kokenut työsi olevan nyt mielekkäämpää verrattuna aikaisempaan?

mielekkäämpää	jonkin verran mielekkäämpää	en osaa sanoa	Vähemmän mielekästä	ei ollenkaan mielekästä

C Oletko kokenut kehittyneesi työntekijänä tutkimuksen aikana?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	en ollenkaan

D Onko tutkimukseen liittyvä koulutus lisännyt tietojasi ja taitojasi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

E Onko tutkimukseen liittyvä koulutus antanut varmuutta työskentelyysi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

F Miten tutkimus on muuttanut asenteitasi terveysneuvontaa kohtaan?

myönteisem-mäksi	hieman myönteisem-mäksi	ei ole muuttanut mitenkään	hieman kielteisem-mäksi	kielteisemäksi

G Onko työsi tehokkuus parantunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

H Onko työmotivaatiosi muuttunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

I Onko tutkimukseen liittyvällä työllä ollut positiivista vaikutusta työyhteisöösi?

kyllä	jonkin verran	en osaa sanoa	vain vähän vaikutusta	ei mitään vaikutusta

J Ovatko tutkimuksen terveysneuvontamallit vaatineet ylimääräistä vaivannäköä?

kyllä	jonkin verran	en osaa sanoa	hieman	ei ollenkaan

K Miten tutkimukseen liittyvät tehtävät ovat vaikuttaneet työssä jaksamiseesi?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

L Oletko kokenut saaneesi tutkimuksen myötä jotain uutta työsi sisältöön?

kyllä	jonkin verran	en osaa sanoa	hieman	en ollenkaan

vapaa sana:

Kysely ryhmän X suorittajille

B Suorittajan ikä

vuotta

C Kokemus alle kouluikäisten lasten terveysneuvonnasta?

kuukautta/vuotta

1 Ajan varaaminen v.2008 syntyneen ensikäynneille

A Kuinka pitkä aika lasten ensikäynneille on tavallisesti varattu?

20 min	30 min	40 min	45 min	50 min	60 min

B Onko ajan pituus ollut toivomustesi mukainen?

aina	useimmiten	joskus	harvoin	ei koskaan

2 Ensikäyntiin liittyvät ohjeet ja -materiaali

A Mitä mieltä olet ennakko-ohjeiden soveltumisesta terveysneuvontaan

soveltuvat erittäin hyvin	soveltuvat kohtalaisesti	en osaa sanoa	soveltuvat huonosti	eivät sovellu neuvontaan

B Miten ravinto-ksylitoli-kansio on toiminut neuvonnassa?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten esitteet ja materiaalit ovat soveltuneet neuvontaan?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

3 v. 2008 syntyneen ensikäynti

A Onko terveystarkastuksessa ollut käytössä hammashoitotuoli?

aina	useimmiten	joskus	harvoin	ei koskaan

B Kuinka olet pystynyt noudattamaan ohjeita?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten vanhemmat ovat suhtautuneet ravintoanamneesin tekoon?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

D Kuinka usein lapsen molemmat huoltajat ovat osallistuneet ensikäyntiin?

aina	useimmiten	joskus	harvoin	ei koskaan

E Onko sinulla ollut toisen tutkimusalueen v. 2008 syntyneitä lapsia ensikäynnillä?

kyllä	ei

F jos on ollut, minkä ryhmän?

on ollut F	ei ole ollut F
on ollut C	ei ole ollut C

G Osasitko tai osaisitko antaa neuvontaa toisen ryhmän mallin mukaan?

kyllä osaisin F	en osaa sanoa F	en osaisi F
kyllä osaisin C	en osaa sanoa C	en osaisi C

4 Käynti ja sen kirjaaminen WinHit-ohjelmaan

A Kuinka monta minuuttia käyntiin ja kirjaukseen on yleensä kulunut?

≤ 20	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56–60	≥ 60

B Onko käyntiin varattu aika aina riittänyt neuvontaan ja kirjaamiseen?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Oletko käyttänyt valmiiksi kirjoitettuja profiilitekstejä?

aina	useimmiten	joskus	harvoin	en koskaan

5 Suorittajan kokemukset tutkimuksesta

A Oletko kokenut tekeväsi hyödyllistä työtä työurasi aikana?

aina	useimmiten	joskus	harvoin	en koskaan

B Oletko kokenut työsi olevan nyt mielekkäämpää verrattuna aikaisempaan?

mielekkäämpää	jonkin verran mielekkäämpää	en osaa sanoa	vähemmän mielekästä	ei ollenkaan mielekästä

C Oletko kokenut kehittyneesi työntekijänä tutkimuksen aikana?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	en ollenkaan

D Onko tutkimukseen liittyvä koulutus lisännyt tietojasi ja taitojasi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

E Onko tutkimukseen liittyvä koulutus antanut varmuutta työskentelyysi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

F Miten tutkimus on muuttanut asenteitasi terveysneuvontaa kohtaan?

myönteisem-mäksi	hieman myönteisem-mäksi	ei ole muuttanut mitenkään	hieman kielteisem-mäksi	kielteisemäksi

G Onko työsi tehokkuus parantunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

H Onko työmotivaatiosi muuttunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

I Onko tutkimukseen liittyvällä työllä ollut positiivista vaikutusta työyhteisöösi?

kyllä	jonkin verran	en osaa sanoa	vain vähän vaikutusta	ei mitään vaikutusta

J Ovatko tutkimuksen terveysneuvontamallit vaatineet ylimääräistä vaivannäköä?

kyllä	jonkin verran	en osaa sanoa	hieman	ei ollenkaan

K Miten tutkimukseen liittyvät tehtävät ovat vaikuttaneet työssä jaksamiseesi?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

L Oletko kokenut saaneesi tutkimuksen myötä jotain uutta työsi sisältöön?

kyllä	jonkin verran	en osaa sanoa	hieman	en ollenkaan

vapaa sana:

Kysely ryhmän F suorittajille

Ympyröi valitsemasi vaihtoehto, voit lisäksi kirjoittaa vapaasti kysymysten jälkeen oleville riveille.

1 Suorittajaa koskevia tietoja

A Ammattinimike

suuhygienisti	hammashoitaja

B Suorittajan ikä

vuotta

C Kokemus alle kouluikäisten lasten terveysneuvonnasta?

kuukautta/vuotta

1 Ajan varaaminen v.2008 syntyneen ensikäynneille

A Kuinka pitkä aika lasten ensikäynneille on tavallisesti varattu?

20 min	30 min	40 min	45 min	50 min	60 min

B Onko ajan pituus ollut toivomustesi mukainen?

aina	useimmiten	joskus	harvoin	ei koskaan

2 Ensikäyntiin liittyvät ohjeet ja -materiaali

A Mitä mieltä olet ennakko-ohjeiden soveltumisesta terveysneuvontaan

soveltuvat erittäin hyvin	soveltuvat kohtalaisesti	en osaa sanoa	soveltuvat huonosti	eivät sovellu neuvontaan

B Miten hammasvälien puhdistuskansio on toiminut neuvonnassa?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten esitteet ja materiaalit ovat soveltuneet neuvontaan?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

3 v. 2008 syntyneen ensikäynti

A Onko terveystarkastuksessa ollut käytössä hammashoitotuoli?

aina	useimmiten	joskus	harvoin	ei koskaan

B Kuinka olet pystynyt noudattamaan ohjeita?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Miten vanhemmat ovat suhtautuneet hampaiden puhdistusopetukseen?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

D Kuinka usein huoltaja on saanut puhdistusopetuksen

aina	useimmiten	joskus	harvoin	ei koskaan

E Onko sinulla ollut toisen tutkimusalueen v. 2008 syntyneitä lapsia ensikäynnillä?

kyllä	ei

F jos on ollut, minkä ryhmän?

on ollut X	ei ole ollut X
on ollut C	ei ole ollut C

G Osasitko tai osaisitko antaa neuvontaa toisen ryhmän mallin mukaan?

kyllä osaisin X	en osaa sanoa X	en osaisi X
kyllä osaisin C	en osaa sanoa C	en osaisi C

4 Käynti ja sen kirjaaminen WinHit-ohjelmaan

A Kuinka monta minuuttia käyntiin ja kirjaukseen on yleensä kulunut?

≤ 20	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56–60	≥ 60

B Onko käyntiin varattu aika aina riittänyt neuvontaan ja kirjaamiseen?

erittäin hyvin	hyvin	en osaa sanoa	huonosti	erittäin huonosti

C Oletko käyttänyt valmiiksi kirjoitettuja profiilitekstejä?

aina	useimmiten	joskus	harvoin	en koskaan

5 Suorittajan kokemukset tutkimuksesta

A Oletko kokenut tekeväsi hyödyllistä työtä työurasi aikana?

aina	useimmiten	joskus	harvoin	en koskaan

B Oletko kokenut työsi olevan nyt mielekkäämpää verrattuna aikaisempaan?

mielekkäämpää	jonkin verran mielekkäämpää	En osaa sanoa	vähemmän mielekästä	Ei ollenkaan mielekästä

C Oletko kokenut kehittyneesi työntekijänä tutkimuksen aikana?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	en ollenkaan

D Onko tutkimukseen liittyvä koulutus lisännyt tietojasi ja taitojasi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

E Onko tutkimukseen liittyvä koulutus antanut varmuutta työskentelyysi?

kyllä	jonkin verran	en osaa sanoa	hyvin vähän	ei ollenkaan

F Miten tutkimus on muuttanut asenteitasi terveysneuvontaa kohtaan?

myönteisem-mäksi	hieman myönteisem-mäksi	ei ole muuttanut mitenkään	hieman kielteisem-mäksi	kielteisemmäksi

G Onko työsi tehokkuus parantunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

H Onko työmotivaatiosi muuttunut tutkimuksen aikana?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

I Onko tutkimukseen liittyvällä työllä ollut positiivista vaikutusta työyhteisöösi?

kyllä	jonkin verran	en osaa sanoa	vain vähän vaikutusta	ei mitään vaikutusta

J Ovatko tutkimuksen terveysneuvontamallit vaatineet ylimääräistä vaivannäköä?

kyllä	jonkin verran	en osaa sanoa	hieman	ei ollenkaan

K Miten tutkimukseen liittyvät tehtävät ovat vaikuttaneet työssä jaksamiseesi?

lisääntynyt	lisääntynyt jonkin verran	en osaa sanoa	vähentynyt hieman	vähentynyt

L Oletko kokenut saaneesi tutkimuksen myötä jotain uutta työsi sisältöön?

kyllä	jonkin verran	en osaa sanoa	hieman	en ollenkaan

vapaa sana:

Appendix 4. Invitation and information about the study (phase IV)

TIEDOTE TERVEYSTIETEELLISESTÄ TUTKIMUKSESTA

Tutkimuksen tausta
Teitä pyydetään osallistumaan tutkimukseen, jossa tutkitaan suuhygienistin toteuttaman ohjauksen vaikutusta suun terveyteen parodontiittia eli hampaiden kiinnityskudostulehdusta sairastavilla. Tutkijana toimii suuhygienisti, terveystieteiden maisteri Mirkka Järvinen.
Pyydän teitä lukemaan tämän tekstin, jotta ymmärrätte mitä tutkimukseen osallistuminen pitää sisällään.

Tutkimuksen tarkoitus
Tutkimuksen tarkoituksena on kehittää suuhygienistien toteuttamaan neuvontaa ja ohjausta niin, että se tukisi enemmän asiakkaan omia voimavaroja ja tukisi asiakkaan omaa osallistumista. Tutkimuksessa verrataan kahta erilaista ohjauskäytäntöä.

Tutkimuksen laajuus ja kesto
Tutkimukseen kutsutaan noin 120 Turun suun terveydenhuollon palveluja käyttävää henkilöä. Tutkimus on seurantatutkimus, jossa suun terveytenne tarkastetaan alkutilanteessa, 1-2 kuukautta ja 6 kuukautta suuhygienistin toteuttaman hoidon ja ohjauksen jälkeen. Lisäksi teitä pyydetään täyttämään kaksi erilaista kyselylomaketta tarkastuskäyntejä varten.

Tutkimukseen osallistuminen
Hammashoitolan ajanvarauksesta otetaan teihin yhteyttä ja kysytään halukkuuttanne osallistua tutkimukseen. Jos päätätte osallistua tutkimukseen, teille varataan **3** aikaa: ensimmäinen ns. aloituskäynti alkutilanteen kartoittamiseksi (EHL Marja Pöllänen) hoitokäynti suuhygienistin vastaanotolle (hoitava suuhygienisti) sekä 3kk seurantakäyntiaika (EHL Marja Pöllänen). Teitä pyydetään palauttamaan tämän tiedotteen mukana tullut suostumuslomake sekä kysely omahoitotottumuksista tullessanne aloituskäynnille. Mikäli ette halua osallistua tutkimukseen, pääsette tarvitsemaanne hoitoon Turun suun terveydenhuollon tavallisten käytänteiden mukaisesti.

Tutkimuksen kulku
Tutkimus toteutetaan Turun kaupungin suun terveydenhuollossa yhteistyössä Turun yliopiston hammaslääketieteen laitoksen kanssa.

Aloituskäynti
Aloituskäynnillä iensairauksiin erikoistunut hammaslääkäri mittaa teiltä ientaskut, plakin määrän, mahdollisen ienverenvuodon sekä mahdollisen kiinnityskudoskadon. Kaikki tutkimukset ovat samoja, joita voidaan tehdä tavallisella hammashoito käynnillä. Aloituskäynnille on tärkeää muistaa tuoda suostumuslomake ja kyselylomake täytettynä.

Suuhygienisti käynti
Aloituskäynnin jälkeen teille on varattu aika suuhygienistille, joka toteuttaa tarpeen mukaisen hoidon eli esimerkiksi hammaskiven poiston. Suuhygienisti myös neuvoo teitä itsehoidon toteuttamisessa. Käyntejä tulee sen verran kuin suuhygienisti arvioi tarpeelliseksi, yleensä 1-4 käyntiä. Saatte suuhygienistiltä omahoito vihkon sekä ohjeet sen käytöstä. Lisäksi saatte mukaanne kyselyn omahoitotottumuksista sekä suuhygienistin vuorovaikutustaitoja kartoittavan kyselyn. On tärkeää, että palautatte kyselyt täytettyinä seurantakäynnillä.

Ensimmäinen seurantakäynti
Ensimmäinen seurantakäynti on 3 kuukautta suuhygienistin hoidon jälkeen. Seurantakäynnillä tehdään samanlainen tutkimus kuin aloituskäynnillä. Lisäksi on tärkeää, että palautatte aiemmin saamanne kyselylomakkeet täytettynä. Saatte mukaanne vielä kerran kyselyn omahoitotottumuksista.

Toinen seurantakäynti
Toinen seurantakäynti on 6 kuukautta suuhygienistin hoidon jälkeen. Seurantakäynnillä tehdään samanlainen tutkimus kuin aloituskäynnillä ja ensimmäisellä seurantakäynnillä. On tärkeää, että palautatte teille aiemmin annetun kyselylomakkeen sekä omahoito vihkon täytettynä.

Mahdolliset riskit
Seurantatutkimukseen ei liity terveydellisiä riskejä.

Kaikki teiltä kerättävä tieto säilyy nimettömänä eikä tietokanta sisällä mitään tunnistamisen mahdollistavia tietoja. Aiempia teistä tehtyjä potilasmerkintöjä tai suostumuslomakettanne ei koskaan liitetä tutkimuksen tietokantaan. Tietojanne käsittelee vain tutkija. Tutkimuksen tilastolliset ajot tekee biostatistikko, jolle tiedot toimitetaan täysin ilman henkilö- tai tunnistetietoja. Kerättävää tietoa käytetään terveystieteelliseen tutkimukseen, johon sisältyy julkaisuja tieteellisissä lehdissä. Julkaisuissa ei kenenkään henkilötietoja tule esille, eikä yksittäisiä henkilöitä voida tunnistaa. Tietoja ei luovuteta eteenpäin. Seuraavia tietoja ei merkitä tietokantaan:

- Nimeänne

- Osoitettanne
- Mitään henkilökohtaisia tietoja, joista teidät voisi tunnistaa.

Tutkimukseen osallistumiseen liittyvät mahdolliset hyödyt
Tutkimuksesta ei koidu teille välttämättä mitään välitöntä hyötyä, mutta tutkimuksen aikana saatte tietoa suunne terveydestä. Tutkimuksesta saatava tieto voi johtaa parodontiitin ja sen hoidon parempaan ymmärtämiseen ja sitä kautta parantaa parodontiittia sairastavien hoidon laatua.

Teille tutkimukseen osallistumisesta aiheutuvat kustannukset
Tutkimukseen osallistuminen on vapaaehtoista eikä siitä suoriteta rahallista korvausta. Suuhygienistikäynti toteutetaan tavallisena hoitokäyntinä, josta suoritatte normaalin hammashoitomaksun. Korvaukseksi aloitus- ja seurantakäynneistä saatte suunhoitotuotteita.

Vapaaehtoinen osallistuminen / vetäytyminen
Osallistumisenne tähän tutkimukseen on täysin vapaaehtoista. Voitte kieltäytyä osallistumasta tai vetäytyä tutkimuksesta miss vaiheessa tahansa, ilman että se vaikuttaisi hoitoonne jatkossa. Kuitenkin kaikki mahdollinen vetäytymiseenne mennessä nimettömänä kerätty tieto säilytetään tutkimusta varten.

Tutkimuslupa
Tutkimukselle on saatu asianmukainen tutkimuslupa Turun suun terveydenhuollosta ja sillä on Turun yliopiston eettisen neuvottelukunnan puolto.

Tutkimukseen ja siihen osallistumiseen liittyvät mahdolliset kysymykset
Mirkka Järvinen, suuhygienisti, terveystieteiden maisteri
puh. 050-5872729, sähköposti: mirkka.jarvinen@utu.fi

Appendix 5. Informed consent

SUOSTUMUS TUTKIMUKSEEN OSALLISTUMISESTA

Parodontiittia sairastavan potilaan itsehoidon tukeminen voimavaraistumista tukevan potilasohjauksen keinoin

Minua on pyydetty osallistumaan suuhygienisti, terveystieteiden maisteri Mirkka Järvisen toteuttamaan tutkimukseen, jossa verrataan kahden erilaisen ohjauskäytännön vaikutusta. Tutkimus toteutetaan Turun kaupungin suun terveydenhuollon tiloissa.

Olen saanut, lukenut ja ymmärtänyt tutkimuksesta kertovan tiedotteen. Tiedotteesta olen saanut riittävän selvityksen *Parodontiittia sairastavan potilaan itsehoidon tukeminen voimavaraistumista tukevan potilasohjauksen keinoin* - seurantatutkimuksesta ja sen yhteydessä suoritettavasta tietojen keräämisestä, käsittelystä ja luovuttamisesta. Tarvittaessa, olen saanut riittävän vastauksen kaikkiin tutkimusta koskeviin kysymyksiini.

Kaikki minusta tutkimuksen aikana kerättävät tiedot käsitellään luottamuksellisina. Tutkimuksessa kerätyt tiedot koodataan siten, ettei henkilöllisyyden selvittäminen ole myöhemmin mahdollista ilman purkukoodia. Purkukoodi säilytetään suljettuna tutkijan (Mirkka Järvinen) arkistossa. Tässä tutkimuksessa kerättäviä tietoja käsittelee tutkijan (Mirkka Järvinen) lisäksi biostatistikko. Biostatistikko käsittelee ainoastaan tutkimuksessa saatuja mittaustietoja (esim. ientaskumittaus) eikä tiedostot sisällä mitään tutkittavan henkilöllisyyteen liittyviä tietoja.

Ymmärrän, että tutkimuksesta ei koidu välttämättä välitöntä hyötyä minulle, mutta tutkimuksesta saatava tieto voi johtaa parodontiitin ja sen hoidon parempaan ymmärtämiseen ja sitä kautta parantaa parodontiittia sairastavien hoidon laatua.

Ymmärrän, että osallistumiseni tähän tutkimukseen on täysin vapaaehtoista. Minulla on oikeus, milloin tahansa tutkimuksen aikana ja syytä ilmoittamatta keskeyttää tutkimukseen osallistuminen. Tutkimuksesta kieltäytyminen tai sen keskeyttäminen ei vaikuta hoitooni jatkossa. Olen tietoinen siitä, että minusta keskeyttämiseen mennessä kerättyjä tietoja käytetään osana tutkimusaineistoa.

Allekirjoituksellani vahvistan osallistumiseni tähän tutkimukseen ja suostun vapaaehtoisesti tutkittavaksi

_____ _____

Allekirjoitus Paikka ja päivä

_____ _____

Nimen selvennys Syntymäaika

_____

Puhelinnumero, sähköposti

Suostumus vastaanotettu

_____

Tutkijan allekirjoitus, nimen selvennys ja päiväys

Allekirjoitettu tutkittavan suostumus jää tutkijan arkistoon. Tutkittavan tiedote jää tutkittavalle.

Appendix 6. Information for dentist

OHJEET HAMMASLÄÄKÄREILLE

MUKAANOTTO

- 18 vuotias tai vanhempi
- Suomenkielentaitoinen
- Uudelle hoitojaksolle tuleva, edellisestä vuosi tai enemmän
- CPI 3, 3-4 mm syviä ientaskuja, vähintään kahdessa sekstantissa

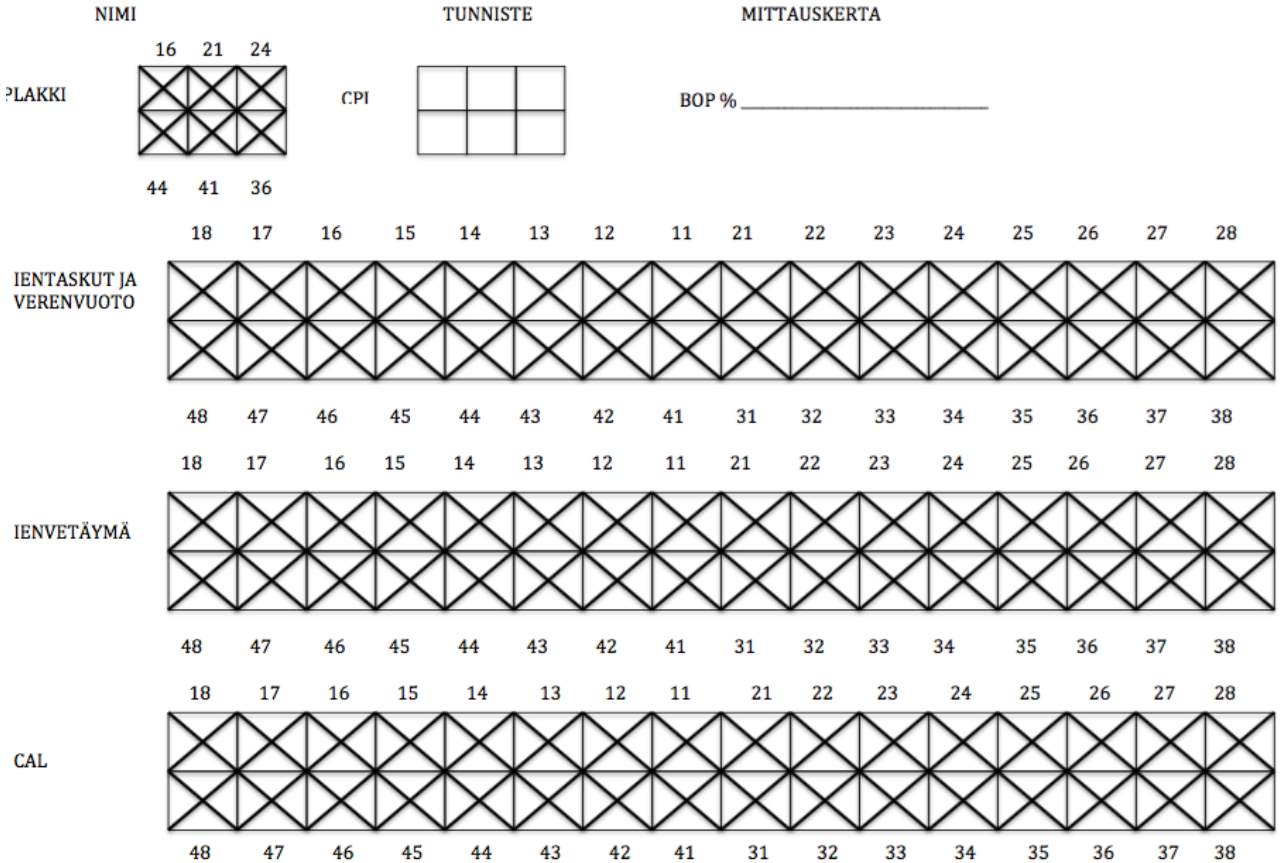
POISSULKU

- Raskaus tai tiedossa, että aktiivisesti suunnittelee raskautta
- Immunosupressiivinen sairaus tai lääkitys
- Verenvuotoa aiheuttava sairaus tai lääkitys (Primaspan 100-200 mg käy)
- Epästabiili diabetes
- Sytostaatti lääkitys
- MRSA, HIV tai hepatiitti
- Antibioottiprofylaksian tarve

TUORE ANAMNEESI POTILAASTA EHDOTON

- ANNA POTILAALLA KIRJEKUORI (tutkimustiedote, lupa, kysely)
- KERRO POTILAALLE, ETTÄ
    - Hänellä on parodontiitti
    - Hänellä on mahdollisuus osallistua tärkeään tutkimukseen, jossa tutkitaan suuhygienistin toteuttaman ohjauksen vaikutusta suun terveyteen
    - Hänen kiinnityskudostulehduksen hoito alkaa tutkimukseen kuuluvalla alkumittauksella (Marja Pöllänen)
    - Hän saa nopeammin ajan suuhygienistille, joka tekee hoidon ja antaa ohjeet
    - Ylimääräisistä maksuttomista tarkastuskäynneistä (3 käyntiä) saa korvaukseksi suunhoitotuotteita. Nämä lyhyet (n. 10 min) tarkastuskäynnit tekee Hammasklinikalla EHL Marja Pöllänen
    - Hänen osallistumisensa tutkimukseen tuo uutta, arvokasta tietoa, jota hyödynnetään potilaiden hoidossa

Appendix 7. Clinical examination form



Appendix 8. Self-care questionnaire

Nimi:_____ No:_____

Kysely omahoidon tottumuksista

Merkitse sopiva vaihtoehto rastilla tai täydennä tarvittaessa.

1. Mahdolliset sairaudet:

2. Käytössä olevat lääkkeet:

3. Millaiseksi koet suun terveytesi?
   ___ erinomaiseksi
   ___ hyväksi
   ___ tyydyttäväksi
   ___ huonoksi

4. Vuotavatko ikenesi hampaita harjatessa?
   ___ ei
   ___ kyllä

5. Vuotavatko ikenesi hammasvälejä puhdistaessasi?
   ___ ei
   ___ kyllä

6. Kuinka usein harjaat hampaasi?
   ___ useammin kuin 2 kertaa päivässä
   ___ 2 kertaa päivässä
   ___ 1 kerran päivässä
   ___ kertaa viikossa
   ___ harvemmin kuin kerran viikossa
   ___ en koskaan

7. Arvioi, paljonko käytät aikaa harjaukseen per harjauskerta _____

8. Oletko saanut ohjausta hampaiden harjauksesta?
   ___ kyllä
   ___ en

9. Jos vastasit edelliseen kysymykseen kyllä, kerro
   a) Keneltä sait ohjeita?_____
   b) Milloin?_____
   c) Millaisia ohjeita olet saanut? _____
   _____

10. Käytätkö
    ___ tavallista hammasharjaa
    ___ sähköhammasharjaa

11. Kuinka usein vaihdat hammasharjasi?
    _____

12. Puhdistatko hammasvälisi
    ___ useammin kuin 2 kertaa päivässä
    ___ 2 kertaa päivässä
    ___ 1 kerran päivässä
    ___ kertaa viikossa
    ___ harvemmin
    ___ en koskaan

Nimi:_____ No:_____

13. Jos puhdistat hammasvälisi, käytätkö
___ hammaslankaa
___ hammastikkua
___ hammasväliharjaa

14. Oletko saanut ohjeita hammasvälien puhdistamisesta?
___ kyllä
___ en

15. Jos vastasit edelliseen kysymykseen kyllä, kerro
a) Keneltä sait ohjeita? _____
b) Milloin?_____
c) Millaisia ohjeita olet saanut? _____
_____

16. Käytätkö fluorivalmisteita, kuten hammastahnaa?
___ useammin kuin 2 kertaa päivässä
___ 2 kertaa päivässä
___ 1 kerran päivässä
___ kertaa viikossa
___ harvemmin
___ en koskaan

17. Tupakoitko?
___ en tupakoi
___ tupakoin, ___ kpl päivässä
___ olen tupakoinut aiemmin ___ vuotta
___ satunnaisesti, ___kpl viikossa

18. Jos tupakoit, oletko saanut tukea ja neuvoja tupakoinnin lopettamiseen?
___ kyllä
___ en

19. Jos vastasit edelliseen kysymykseen kyllä, kerro

a) Keneltä sait tukea ja neuvoja?_____
b) Milloin?_____
c) Millaisia neuvoja ja millaista tukea sait?_____
_____

20. Onko mielestäsi suun omahoidon tottumuksissasi jotain muutettavaa?

___ En koe tarvetta muuttaa tottumuksiani
___ Koen tottumusten muuttamisen tarpeellisena
___ Olen jo muuttanut tottumuksiani

21. Jos vastasit "koen tottumusten muuttamisen tarpeellisena"

a) Mikä on muutoksesi tavoite?_____
_____
b) Milloin olisit valmis tekemään muutoksen?_____
c) Mitä keinoja käyttäisit muutoksen toteuttamiseksi?_____
_____
d) Mistä sait ajatuksen muutoksen toteuttamiselle? _____
_____

22. Jos vastasit "olen jo muuttanut tottumuksiani"

a) Mitä muutit?_____
_____
b) Milloin teit muutoksen? _____
c) Mitä keinoja käytit muutoksen toteuttamiseksi? _____
_____
d) Mistä sait ajatuksen muutoksen toteuttamiselle? _____
_____

Kiitos vastauksistasi!

Appendix 9. Communication assessment tool

Viestinnän arviointityökalu

Viestintä potilaiden kanssa on hyvin tärkeä osa laadukasta hoitoa. Haluaisimme kuulla, miltä sinulle hoidon ja kotihoito-ohjeet antaneen **suuhygienistin** viestintä sinusta tuntui. Vastauksesi ovat täysin luottamuksellisia. Pyydämme siksi, että olet mahdollisimman avoin ja rehellinen. Kiitos.

1	2	3	4	5
heikko	**kohtalainen**	**hyvä**	**erittäin hyvä**	**erinomainen**

Käytä tätä asteikkoa, kun arvioit suuhygienistin viestintää kanssasi.
Ympyröi vastauksesi kuhunkin kohtaan alla.

Suuhygienisti	heikko				erinomair
1. tervehti minua tavalla, joka sai oloni mukavaksi.	1	2	3	4	5
2. kohteli minua kunnioittavasti.	1	2	3	4	5
3. oli kiinnostunut omaa terveyttäni koskevista ajatuksistani.	1	2	3	4	5
4. ymmärsi pääasialliset terveyttäni koskevat huolenaiheeni.	1	2	3	4	5
5. kiinnitti minuun huomiota (katsoi minua, kuunteli huolellisesti).	1	2	3	4	5
6. antoi minun puhua keskeyttämättä.	1	2	3	4	5
7. antoi haluamani verran tietoa.	1	2	3	4	5
8. käytti puhuessaan sanoja, jotka saatoin ymmärtää.	1	2	3	4	5
9. tarkisti, että ymmärsin kaiken.	1	2	3	4	5
10. rohkaisi minua esittämään kysymyksiä.	1	2	3	4	5
11. otti minut mukaan päätöksentekoon sen verran kuin halusin.	1	2	3	4	5
12. kertoi seuraavista askelista, myös mahdollisista jatkosuunnitelmista.	1	2	3	4	5
13. osoitti huolellisuutta ja huolenpitoa.	1	2	3	4	5
14. käytti kanssani oikean verran aikaa.	1	2	3	4	5

Halutessasi, voit kirjoittaa alla olevaan tilaan vapaasti ajatuksiasi suuhygienistin toteuttamasta kotihoidon ohjauksesta ja neuvonnasta.

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