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Behavioural science in dentistry. The role of the dental hygienist in prevention and treatment of the fearful dental patient

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Abstract: The prevalence of dental anxiety in the general population seems to be fairly stable, and the incidence is not reduced in spite of more modern treatment methods. Intensive fear often leads to avoidance of care and consequences like poor oral health, psychosocial problems and reduced quality of life. The aetiology of dental anxiety is complex, but is often associated with direct traumatic dental experiences during childhood. These negative experiences are reported as painful/unpleasant and are influenced by the patient's perception of lack of coping and control. The theory of latent inhibition indicates that several positive dental appointments before any invasive or painful treatment sessions may act as a barrier to these perceptions of lack of coping. This paper is presenting a short overview of behavioural science in dentistry and discussing the role of the dental hygienists as potential key personnel in prevention and treatment of dental anxiety.

Key words: dental anxiety; prevention; treatment; dental hygienists

Introduction

The provider of dental care often relates that some patients do not cooperate or behave in such a way that planned treatment is made difficult or impossible. These behavioural management problems (BMP) can be defined as the provider's experience of the way the patient is cooperating in the dental treatment situation (1). Lack of cooperation is often difficult to handle and may represent occupational stress for the provider of care. The reason for this behaviour is multifactorial, with fear and anxiety

as major related factors. The dental setting is a social situation involving interaction with others, and perception of a positive interpersonal relationship with the provider of care is of vital importance for the patient's feeling of coping with dental treatment.

Dental hygienists are health professionals whose primary concern is the promotion of total health through prevention of disease. Clinical dental hygienists may work in a variety of both private and public health care settings, and the role and clinical time spent by dentist and dental hygienist varies between different countries and cultures. Dental hygienists are often in a key position for prevention of disease by being the primary care contact for the child and their parents. In the Nordic countries the children are regularly called to the public dental service and treated according to their needs. However, the recall intervals have gradually been extended and more individualized of efficiency reasons, and the dental hygienists are to a greater extent given the first line role as the primary health care provider (2). A study in Norway has shown that a substantial portion of children received all dental care from hygienists, and that 40% of the dentists' time was consumed by 10% of the children with most new decayed teeth (3). This study reveals that dentist resources can be saved by utilization of dental hygienists. However, this role as the primary personal contact also represents the responsibility for introducing the child into the world of dental health care. To learn how to cope with future potentially painful or invasive dental treatment is of vital importance for the prevention of dental anxiety in the future (4). Sufficient knowledge and competence in the area of behavioural science is also necessary to be able to diagnose and to give systematic treatment of the fear/anxiety itself. Research has indicated that hygienists are successful in different behavioural aspects of their work (5). The dental hygienist curriculum already includes elements of basic psychology. An extension/revision of the curriculum may provide the ability to make these health professionals key personnel for prevention of dental anxiety and behavioural management problems.

Terms and definitions

The terms fear, anxiety and phobia are often used interchangeably in the literature for the same general concept. Clinically there are no distinct borders between different levels of fear and anxiety, but operationally the terms can be separated by different definitions (6, 7).

Fear is a normal emotional response to perceived threat or danger (e.g. painful treatment). An adaptive fear response (adequate coping) is elicited, including cognitions and physiological reactions as well as behavioural responses such as avoidance of dental care. Fear is therefore a normal and functional behaviour.

Anxiety. Fear is a central component in anxiety, but the fear response is now more excessive, inadequate (insufficient coping). Catastrophic thoughts and negative self-instructions dominate the cognitive response, with anticipated unpleasantness and insufficient coping. Need for treatment is displaced, and the avoidance response is not longer functional.

Phobias are characterized by intense anxiety and approach–avoidance conflict. Fear is recognized by the person as excessive or unreasonable. Avoidance, anxious anticipation or distress in the feared situation(s) interferes significantly with the person's normal routine life. The specific diagnostic criteria that has to be fulfilled for the diagnosis of specific phobia (including odontophobia/dental phobia) are defined in Diagnostic and Statistical Manual of Mental Disorders (DSM-IV^{TM}) (8) and International Statistical Classification of Diseases and Related Health Problems (ICD-10) (9).

Prevalence and consequences of dental anxiety and dental phobia

The prevalence of dental anxiety in the general population seems to be fairly stable and the incidence is not reduced in spite of more modern treatment modalities. The prevalence of dental anxiety ranges between 4 and 20%, independent of population, culture or country (10–18). The prevalence is higher for children, adolescents and young adults, and is decreasing by age (19). The prevalence of subjects fulfilling the criteria for dental phobia (DSM-IV or ICD-10 criteria for specific phobias) is difficult to measure as these patients are not attending dental clinics, but the prevalence can be estimated to 2–3% of the adult population.

The effect of dental anxiety and avoidance of care on oral health is reported in several studies. Subjects avoiding dental care have more missing teeth, caries and periodontitis compared with matched controls (20), and the negative oral health effect has also been reported in a large epidemiological study in Norway (14). Phobic patients report lower quality of life, represented by higher rates of unemployment, sick leave, psychosomatic symptoms and negative social effects (21).

Aetiology of dental fear and anxiety

Acquisition and generalization of fear and phobias are well documented to follow the theory of classical conditioning (22).

The importance of classical conditioning in dentistry, via negative treatment experiences in early childhood, are confirmed in many studies and seems to be of major importance also in the development of dental anxiety (23–25). The unconditioned stimulus is in the dental context represented by a negative stimulus during treatment (e.g. drilling without anaesthesia). This stimulus causes a reflexive response like pain or fear (unconditioned response). Contextual stimuli (e.g. sound of the drilling, the smell, the feeling of vibrations) represent conditioned stimuli that, after having been repeatedly paired with the painful treatment (drilling), alone provokes the same reflexive response (conditioned response).

Dental anxiety has been shown to correlate with factors like age, gender (higher proportion of women), dental visiting habits (irregular dental care), previous experiences of pain during dental treatment, beliefs of the dentist, oral health and psychosocial factors (26).

Previous experiences of pain have clearly been shown to be a major factor related to dental anxiety. A Norwegian study has shown that adolescents reporting more than one painful or unpleasant experience during childhood had a 10× higher probability of being included in a high dental anxiety group at 18 years of age, compared with subjects having experienced pain only once or never (13). The self-reported negative experiences are subjective, and sufficient pain control is imperative, and has to be based on the patient's own subjective evaluation of the situation (27). The treatment procedures in the dental hygienist's chair may also represent a distressing event for the patient (28), indicating the same importance of sufficient pain control.

The theory of latent inhibition

The direct conditioning pathway of fear, shown to be the major pathway for the development of fear in children, is complex and moderated by other mechanisms. Among these the theory of latent inhibition may be of clinical importance in the dental context. According to this theory, the association between the conditioned and the unconditioned stimuli may be formed less likely if the conditioned stimuli are presented alone (in several occasions) before it is combined with the unconditioned one (29, 30). Clinically this means that several positive dental appointments before any invasive and painful/unpleasant treatment sessions will act as a barrier to perceived painful experiences and lack of coping/control. The non-invasive treatment sessions with the dental hygienist may increase the capacity of the child to cope with future potentially invasive treatment sessions (31). These behaviour management techniques (tell–show–do) are important for successful dental treatment in small children (32). A dental hygienist with sufficient knowledge in the area of behavioural science will be in a position to reinforce the mechanisms based on the theory of latent inhibition.

Diagnoses and measurement of fear, anxiety and phobia

Clinically it is often difficult to estimate to what extent fear and anxiety are the reasons for the patient's lack of cooperation. A Swedish study has shown that 27% of children with BMP were dentally fearful, while 61% of the children with dental fear reacted with BMP (33). Many patients are cooperating in spite of high levels of fear or anxiety (14), with high risk of irregular dental attendance behaviour (dental avoidance) and future drop out from care. Diagnoses and measurement of fear/anxiety is therefore important to be able to start the treatment of fear itself.

The response that is elicited in fear and anxiety is usually presented in three systems: the physiological response (sympathetic activity), the behavioural response (what the patient is doing) and the cognitive response (thinking – evaluation of the situation). Fear and anxiety can be measured by corresponding indicators. As an example, child fear may be measured based on a categorization of child behaviour during treatment. The most usual way to measure fear/anxiety in populations or groups of subjects is by use of psychometric instruments that are pre-tested and shown to be reliable and valid. Some of these scales can also be used in the waiting room to give the provider indications about the patient's level of dental fear/anxiety.

Treatment principles

It is essential to have a basic understanding of the psychological reactions in anxiety and phobia, understood in this paper as learned behavioural patterns originating from a normal and functional fear response. This means that there is a potential for relearning. There is considerable evidence that the most effective treatment of a wide variety of fears involves the controlled exposure of patients to the feared stimulus (34). For example, behavioural control (signal mechanisms and escape conditions) were found to lower arousal and fear (35). Basic principles should be to establish report, building trust and generally to contribute in different ways to give the patient the perception of control and coping in the dental setting. The construct of control may be readily operationalized in dental care

settings (4, 36), represented by informational control (explain to the patient about the instruments and procedures), behavioural control (stop signals), cognitive control (reconstruction of negative/catastrophic thought) and retrospective control (discuss and explain what happened). Sufficient pain control based on the patients own evaluation of the situation is imperative (4).

Conclusions

Knowledge in the area of behavioural science is important for health care professionals. Dental hygienists are key personnel in dental care, as they are often in a position to introduce the child into the world of dentistry. The first sessions in the dental chair may be of major importance for the child's future perception of coping with dental treatment. Establishing report, building trust and pain control based on the patient's own subjective experience of the situation are imperative for prevention of future problems with dental anxiety and lack of coping (4). A dental hygienist with knowledge about communication, basic psychology, dental fear, treatment principles and social theory of behaviour will be well qualified to have this important responsibility. There is only one additional assumption; the dental health professionals have to work in a team where the dentist also has sufficient qualifications and engagement in patient care.

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