A REVIEW OF THE RESEARCH EVIDENCE BASE FOR

ORAL CARE PROCEDURES UTILISED BY NURSES

A clinical effectiveness review

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1 INTRODUCTION

Nurses have an essential role to play in delivering oral care to their patients. However, there is a growing body of evidence to suggest that this care is often not based on soundly researched methods but on custom and practice which is now outmoded.

This report is an attempt to review the current research evidence base for oral care procedures utilised by nurses in order to identify best practice. This will assist in training provision, will support the production of practice guidelines and will assist in the formulation of nursing standards.

2 METHOD

A computerised literature search of computer-stored databases was carried out, including MEDLINE and CINANL, and the reference lists of the retrieved articles were reviewed for hitherto unretrieved articles. Newly identified articles were reviewed for relevance. Only studies published or abstracted in English were included as translating facilities were not available. The key terms of nursing, oral care and mouth care were used as starting points. Retrieved studies were categorised as primary research, reviews and guidelines.

It was the original intention to include in this review only those studies which were based on a robust research design, and to categorise studies accordingly to the methods employed. However, due to the extreme paucity of such studies, this approach was abandoned and this report includes all relevant articles, irrespective of their design limitations. The majority of studies report the clinical practice and observation of authors and there are few clinical trials.

There are probably a number of reasons why there is a notable lack of well designed research reports in this field. These may include:-

- The transient nature of the contact between nurse and patient.
- The problem of sample size and obtaining control subjects at ward level.
- The low status of research into oral care, as perceived by many.
- The perceived lack of relevance of oral care research to nursing practice.

The results of the literature review are presented here, together with a discussion of the implications for nursing practice, for nurse training and for further research.

3 RESULTS

In total 70 papers were retrieved and reviewed. It was clear that much nursing time continues to be invested in procedures rooted in tradition and anecdote (Crosby, 1989) and the literature contains many references to the lack of research on care provision (Gonert, 1995). In fact, much of the literature is based on anecdote, rarely validated through research and is often contradictory (Holmes, 1996).

Peate (1993) stated that current practice does not reflect the literature with respect to oral hygiene. This is a view echoed throughout the literature on countless occasions.

3.1 Oral Assessment

Poor assessment strategies highlighted the existence of methods that are both inappropriate and dangerous to patients and nurses. Several authors (Longman and De Walt, 1986; Richardson, 1987; Hayes, 1981; Watson, 1989) have called for nurses to be more astute in caring for the mouths of their patients. They claim that by assessing the patient on an individual basis and using the correct tool, then comfort will follow.

Barnett (1991) however, stated that better mouth care would not necessarily occur, even if there were more of an emphasis placed on assessment, because of a theory - practice gap.

Hunt (1987) suggested that the reasons why elements of care such as oral hygiene are practised inappropriately may be that either knowledge is not possessed, understood or believed or there is an inability to convey knowledge from theory into practice, or there is an unwillingness to change in relation to the provision of care.

3.2 Toothbrushes v Foam Swabs

There is strong evidence from a review of many studies by Addy (Addy et al, 1992) to suggest that the use of a toothbrush is the most effective method for removing dental plaque. However, a number of studies (Howarth, 1997; Harris, 1980) have reported that a toothbrush is not usually the nurse's first choice of oral hygiene tool and that they consistently prefer the use of a foam swab. De Walt (1975), in a research study of 48 older patients, found that a toothbrush was 4 times more likely to cause deterioration of soft tissues than a foam swab. However, the foam swab group had worse plaque scores. This study suggests that the medium multi-tufted toothbrushes used with vertical strokes were too traumatic, especially for elderly mouths. Soft brushes and short horizontal strokes were recommended for efficient plaque removal with minimal gingival trauma.

Kite and Pearson (1995) offer a practical suggestion that soft, multi-tufted baby's brushes are gentle and small enough to enable easy access to the mouth. Jenkins (1989) and Miller & Rubinstein (1987) concur with this view. These suggestions were based on observed clinical practice.

De Walt's study concluded that the foam swab was an ineffective tool for removing plaque and it has been suggested by both Harris (1980) and Trenter-Roth and Creason (1986) that they are chosen by nurses because of their manipulability. Jenkins (1989), in recommending paediatric sized toothbrushes for use on all wards, argued that nurses were prejudiced against toothbrushes because of their size, and found that research favouring the use of a toothbrush was not known by many nurses. Moore (1995) asserts that the toothbrush is by far the most cost-effective tool to employ and provides a reminder from Howarth's study in 1977 that the present evidence in favour of the toothbrush is so outstanding that it would seem to remove all question that this is the method of choice.

Foam swabs have been suggested to be effective in cleaning the soft tissues (Buglass, 1995) and, when soaked in chlorhexidine, are a useful method of reducing plaque levels when tooth brushing cannot be performed (Ransier et al, 1995). Swabbing with gauze and plastic forceps occurs commonly but has been shown to be ineffective in removing oral debris (Howarth, 1977). Harris (1980) suggested that a swab wrapped around a gloved finger may have its uses where tooth brushing was impossible and he emphasized the importance of choosing the appropriate tool based on individual patient assessment, based on their clinical observations.

3.3 Chlorhexidine

A number of mainly clinical observation studies have investigated the use of chlorhexidine, sodium bicarbonate, hydrogen peroxide, lemon and glycerine and soft paraffin in oral care (Crosby, 1989; Hallett, 1984; Howarth, 1977). Crosby (1989), and Solomon et al (1995) cite Ferretti et al's study (1987) which demonstrated the effectiveness of chlorhexidine rinsing in patients undergoing intense chemo and radiotherapy prior to bone marrow transplant. The dental literature is unequivocal in its support of chlorhexidine's effectiveness in reducing plaque levels as reviewed by Addy (1986).

3.4 Lemon and Glycerine

Adams (1996) points out that as long ago as 1977, Howarth, in an observational study (Howarth, 1977) found lemon and glycerine to be inappropriate for use in mouth care as the glycerine at first stimulates saliva production but then causes reflex exhaustion. Kite and Pearson (1995) cite Wiley (1969), who suggested from clinical observation that lemon and glycerine infused into cotton swabs reduced oral pH to 2-4 and also reduced salivary amylase levels. Davis and Winter (1980) and Crosby (1989), among others, refer to the acidity of lemon and its role in enamel decalcification and as an irritant.

3.5 Sodium Bicarbonate

The value of sodium bicarbonate has been questioned. Gooch (1985) found it to be an effective cleanser of oral soft tissues, dissolving mucus and buffering acidity based on clinical observation. Thurgood (1994) suggests it is used only when tenacious mucus is present and Kite and Pearson (1995) caution that if incorrectly diluted (1% w/v), the solution can cause superficial burns of the mucosa and, by altering the pH, it has the potential to upset the normal oral flora. In addition, sodium bicarbonate solution has a distinctly unpleasant taste, which may not be tolerated by patients. Peate (1993) found that nurses used sodium bicarbonate in varying strengths from half a teaspoon: 30ml of water to 2 tablespoons: 180ml of water. Hatton-Smith (1994) reported similar confusion in a small sample of twelve nurses.

3.6 Hydrogen Peroxide

Hydrogen peroxide was suggested to be a more effective agent than Milk of Magnesia or an alkaline mouthwash by Passos and Brand (1966), but the validity of their study has been criticised (Trenter Roth & Creason, 1986) and it is difficult to support their view. Turner (1994) points out the need for adequate dilution to avoid mucosal damage, whereas Tombes and Galluci (1993) provide evidence that hydrogen peroxide harms the oral mucosa and its use should be avoided. Their study of 3 groups of healthy individuals, using either normal saline, 1 strength or 3 strength hydrogen peroxide mouthwashes over a 5 week period demonstrated significant musocal abnormalities in both groups using hydrogen peroxide. The saline group did not record any mucosal changes. Their study also reported strong subjective reactions from the volunteers and reinforced their recommendations to avoid in oral care. Furthermore, hydrogen peroxide can cause overgrowth of filiform and foliate papillae of the tongue (Daeffler, 1980) which forms an excellent medium for candidiasis. Patients using hydrogen peroxide have reported dry mouth, thirst and discomfort (Madeya, 1996) and Feber (1995) in an RCT of mouth care reported that radiotherapy patients found it to be very astringent.

3.7 Saline Mouthwashes

Saline mouthwashes are widely advocated in the nursing literature. Normal saline is not damaging to the oral mucosa (Madeya, 1996) and an isotonic solution (0.9% /v) is recommended for mouth care by Thurgood (1994). Feber (1995) concluded that saline rinses may be more effective than a regime using a more astringent mouthwash and Heals (1993) also advocated their use. However, the effectiveness of saline compared with plain water requires further evaluation (Mallett and Bailey, 1996). Holberton et al's small scale pilot study (1996) with ICU patients concluded that tap water was preferred by patients and was less costly than saline. Gooch (1985) and Clarke (1993) suggest that tap water is the ideal mouthwash, a view also endorsed by Holmes (1996) and Adams (1996). Dodd et al (1996) suggested that chlorhexidine was no more effective than water in preventing chemotherapy-induced oral mucositis, and was far more cost efficient.

3.8 Fluoride Preparations

The dental literature contains a vast amount of evidence to support the use of fluoride preparations in preventing dental caries (Levine, 1996). However, despite the benefit of fluoride rinses to dentate patients, in particular those who are receiving radiotherapy involving the salivary glands (Stookey, 1990), there is hardly any mention of this in the nursing literature.

3.9 Lip Care

For the prevention of dry, cracked lips, soft paraffin is widely advocated (Heals, 1993; Adam, 1996; Madeya, 1996). However Beck and Yasko (1993) caution against the use of oil based lubricants inside the mouth because of the danger of aspiration.

3.10 Xerostomia

Suggestions for the management of xerostomia are well documented in the literature. Although crushed ice, sips of water and water sprays provide temporary relief, they have little or no continued effect (Howarth, 1977). Sweeney and Bagg (1995), among others, recommend the use of saliva substitutes, in particular the mucin based product Saliva Orthana (which also contains fluoride) and the carboxymenthyl cellulose preparation Glandosane. Beck (1979) reported that the volume used should be the minimum necessary to maintain lubrication, as an excess can increase discomfort.

3.11 Frequency of Mouth Care

There are many references within the literature to the importance of frequency of oral care. However, there is no consensus as to the optimal frequency of oral hygiene treatments (Trenter Roth & Creason, 1986). Several studies, based on patients' observations, conclude that frequency and consistency in performing oral care are paramount (Dudjak, 1987; Howarth, 1977).

Howarth's early observational study concluded that 4-hourly intervals were not adequate in maintaining oral comfort for acutely ill adults, yet De Walt (1975) found no significant differences in the condition of the mouth between groups who received oral hygiene at 2, 3 & 4 hourly intervals, in a study of 48 elderly patients. Gooch (1985) advocated hourly oral moistening for dehydrated patients, while Beck (1979), in her non-randomised study of 47 patients undergoing cytotoxic chemotherapy, found that oral care performed 4 times daily resulted in 50% fewer oral infections than a control group.

3.12 Care of Dentures

The care of dentures in an area often neglected by nurses (Heals, 1993). Sweeney and Bagg (1995) recommend thorough cleaning at least once a day and preferably rinsing after every meal. Dentures should be removed at night and soaked in a dilute solution of Milton (for acrylic dentures). Jagger and Harrison (1995) found that a large number of people do not know how to clean dentures satisfactorily. This finding is complicated by nurses attitudes towards handling a patient's dentures. Eadie and Shou (1992) found that carers in their study considered oral care unpleasant, unrewarding and problematic, whereas Boyle (1992) also suggests that the majority of nursing staff in his study found mouth care unpleasant and disliked handling dentures.

4 DISCUSSION

It would appear from this review that, as Moore (1995) reported, there have been few changes in oral care practices of nurses for three decades, together with a desperate lack of up to date research in this field. Although there does appear to be strong evidence for the use of a small, soft toothbrush, the literature suggests this is still not common practice - even thought it could be presumed that nurses use a toothbrush for their personal oral care. Similarly, there is evidence for the benefits of chlorhexidine (for plaque control), fluoride and water mouthwashes and against the use of lemon and glycerine swabs and hydrogen peroxide mouthwashes, yet the latter are still in frequent use.

Several studies have assessed nurse's knowledge of basic oral hygiene practice. Peate (1993) suggests there is a theory-practice gap in relation to nurse administered oral hygiene, while Adams (1996) found a lack of general knowledge about oral health in a sample of 34 qualified nurses. Logan et al (1991) reported, in a survey of nurses working with older people that many misconceptions exist about what constitutes appropriate oral care practices with this group. Both Miller and Rubinstein (1987) and Barnett (1991) claim that oral care training is not often delivered by specialists during initial nurse education and that this is significant.

Kite (1995) stresses the implementation of providing a high quality knowledge base with information that is relevant to the context, concentrating on its applicability to practice. She suggests it is necessary to find out what nurses do and why they do it, before information and support can be tailored to meet the perceived need.

There is a clear need to provide adequate training for nurses in evidence based oral health care, both in their initial and post basic education. Theory and practice need to be more closely integrated so that ritualised practices are discouraged. Nurses need mechanisms for assessing patient's oral care needs on an individual basis and be provided with adequate tools to enable them in this task. This requires a commitment to changing practice at manager level.

Further research is required into the efficacy, safety and cost effectiveness of commonly used oral hygiene products and the frequency of oral health care delivery. The barriers to changing ineffective nursing practices are also worthy of further investigation.

This review confirms that current practice largely ignores the research evidence and is inadequate for ensuring optimum care. There is a clear need to develop and evaluate oral care protocols for hospitalised patients and to support nurses in their implementation.

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ORAL HYGIENE PROCEDURES IN HOSPITAL

SUMMARY OF EVIDENCE

The strength of evidence is mainly drawn from review based articles (33) and primary research (23). There is much cross-reference of early studies mainly based on observational studies. The recommendations which utilise oral practices used in the general population, toothbrush, chlorhexidine and fluoride preparations are based on strong evidence from, mainly, the dental literature.

Many other preparations with evidence against their use have been identified as inappropriate up to over two decades ago.

There is a paucity of well constructed randomised clinical trials.

STRONG EVIDENCE FOR

Small, soft toothbrush
Fluoride preparations for dentate patients
Chlorhexidine mouthwashes for plaque control

EVIDENCE FOR

Water mouthwashes for cleaning teeth
Artificial saliva for dry mouths
Soft paraffin for preventing dry lips

EVIDENCE AGAINST

Hydrogen peroxide mouthwashes
Lemon and glycerine swabs
Foam swabs for cleaning teeth
Gauze and forceps

INSUFFICIENT EVIDENCE

Sodium bicarbonate mouthwashes
Saline mouthwashes
Frequency of oral care
Oral assessment procedures